Parental and Familial Predictors and Moderators of Parent Management Treatment Programs for Conduct Problems in Youth

Anna Dedousis-Wallace

Sophia A. Drysdale

John McAloon

Thomas H. Ollendick

Author note:

Correspondence regarding this article should be addressed to Anna Dedousis-Wallace, The Kidman Centre, University of Technology Sydney, Randwick NSW 2031, Australia. Anna.wallace@uts.edu.au

Anna Dedousis-Wallace, The Kidman Centre, University of Technology Sydney, Randwick NSW 2031, Australia, and Discipline of Clinical Psychology, Graduate School of Health, University of Technology Sydney, Ultimo, NSW, Australia. https://orcid.org/0000-0002-6167-7467.  anna.wallace@uts.edu.au

Sophia Drysdale, The Kidman Centre, University of Technology Sydney, Randwick NSW, Australia. Sophia.drysdale@uts.edu.au

John McAloon, Discipline of Clinical Psychology, Graduate School of Health,
University of Technology Sydney, Ultimo, NSW, Australia. ORCID 0000-0001-8896-2578
John.mcaloon@uts.edu.au

Thomas H. Ollendick, Department of Psychology, Virginia Polytechnic Institute & State University, Blacksburg, VA, USA. tho@VT.EDU

Abstract

Despite the established efficacy of Parent Management Training (PMT) for conduct problems in youth, evidence suggests that up to half of all treated youth still display clinical levels of disruptive behavior post-treatment. The reasons for these unsatisfactory outcomes are poorly understood. The aim of the present review was to provide an updated analysis of studies from the past 15 years that examined parental and familial predictors and moderators of improvement in PMT for conduct problems. A systematic literature review of indicated prevention (children with conduct problem symptoms) and intervention (children with clinical diagnoses) studies published between 2004 and 2019 was conducted. This 15-year time period was examined since the last systematic reviews were reported in 2006 and summarized studies completed through mid-2004 (see Lundahl, Risser, & Lovejoy, 2006, and Reyno & McGrath, 2006). Risk of bias indices was also computed (see Higgins, Savović, Page, & Stern, 2016) in our review.  A total of 21 studies met inclusion criteria. Results indicated that a positive parent-child relationship was most strongly associated with better outcomes; however, little additional consistency in findings was evident. Future PMT research should routinely examine predictors and moderators that are both conceptually and empirically associated with treatment outcomes. This would further our understanding of factors that are associated with poorer treatment outcome and inform the development of treatment components or modes of delivery that might likely enhance evidence-based treatments and our clinical science.  Protocol Registration Number: PROSPERO CRD42017058996.

Keywords: Parent Management Training, predictors, moderators, child conduct problems

Persistent conduct problems (CP) in childhood have been associated with a variety of negative outcomes in adolescence and adulthood, including poor academic achievement, school dropout during adolescence, drug abuse, juvenile delinquency and depression (Colder, Scalco, Trucco, Read, Lengua, Wieczorek, & Hawk, 2013; Jerrell, McIntyre, & Park, 2015; Kim-Cohen, Caspi, Moffitt, Harrington, Milne, & Poulton, 2003; Moffitt & Caspi, 2001; Merikangas, Nakamura, & Kessler, 2009; Murrihy, Kidman, & Ollendick, 2010; Stringaris, Lewis, & Maughan, 2014; Tanner-Smith, Wilson, & Lipsey, 2013 ). The impairments associated with CPs represent the most common reason that families seek help in primary care and hospital settings (see Merikangas, Nakamura, & Kessler, 2009, for a review). Left untreated, these symptoms account for a significant cost at both the personal, societal, and economic level (Beecham, 2014; Christenson, Crane, Malloy, & Parker, 2016; Kim-Cohen, Caspi, Moffitt, Harrington, Milne, & Poulton, 2003; Merikangas, Nakamura, & Kessler, 2009).

Conduct problems consist of disruptive behaviours that can range from relatively mild behaviours, such as temper tantrums and minor defiance, to more severe behaviours that violate societal rules, such as stealing, destruction of property, and physical aggression (Murrihy et al., 2010). Children with persistent CPs typically meet the Diagnostic and Statistical Manual (DSM-IV, DSM-5; American Psychiatric Association 1994, 2013) criteria for oppositional defiant disorder (ODD) or conduct disorder (CD). Oppositional defiant disorder refers to a recurrent pattern of angry/irritable mood and inappropriate levels of defiance, aggression and vindictiveness toward authority figures. Conduct disorder includes more severe antisocial and aggressive behaviors that involve serious violations of others' rights or their property. Hereafter, the range of conduct problems present in ODD and CD will be referred to as CPs. Due to the high costs of CPs at an individual, family, and societal level, investigating ways to effectively intervene has received much attention.

Parent Management Training (PMT) in its various forms and formats is based on operant conditioning principles and social learning theory (Brainerd & Kazdin, 2005) and is one of the most widely used interventions for CPs (Eyberg, Nelson, & Boggs, 2008; Murrihy et al., 2010). In essence, these models describe how behavior is learned and modified by reinforcement and punishment processes and that child behavior problems develop, are maintained by, and/or exacerbated in the context of the parent-child relationship (Kaehler, Jacobs, & Jones, 2016). Furthermore, it is hypothesized that teaching parents the principles of behavioral management will result in effective, sustainable changes in child behavior (Danforth, 1998). A major premise of PMT is that ineffective parenting practices, such as harsh and inconsistent discipline, contribute to

the origins and course of oppositional behavior in youth and, therefore, changing problematic parenting

practices is the primary focus of intervention. In practice, PMT typically includes strategies aimed at helping

parents be more consistent and contingent in their responses by using clear and direct commands, differential

attention, contingent reinforcement, response cost, and time-out from reinforcement. Another focus of treatment

is improving the parent-child relationship and encouraging positive involvement and communication between

the parent and the child. Representative PMT programs include: the COMET program (Kling, Forster, Sundell

& Melin, 2010); The Defiant Child (Barkley, 2013); Helping the Non-Compliant Child (HNC; McMahon &

Forehand, 2003); the Incredible Years (IY-PT; Webster-Stratton & Reid, 2003); Parent–Child Interaction

Therapy (PCIT; Brinkmeyer & Eyberg, 2003); Parent Management Training Oregon Model (PMTO: Patterson,

Reid, Jones, & Conger, 1975); Integrated Family Intervention for Child Conduct Problems (Dadds & Hawes,

2006), and finally, Triple P-Positive Parenting Program (Triple P: Sanders, 1999);

      PMT is among the most extensively studied and validated treatment for CPs (e.g., Deković & Stoltz,

2015; Eyberg, Nelson, & Boggs, 2008; Michelson, Davenport, Dretzke, Barlow & Day, 2013). These

interventions have been shown to produce positive outcomes in both efficacy and effectiveness trials in "real-

world" clinical settings, across different cultures, languages and populations (Menting, Orobio de Castro, &

Matthys, 2013; Michelson et al., 2013; Webster-Stratton, Gaspar & Seabra-Santos, 2012). Limitations are,

however, evident in research findings associated with PMT treatment trials. For example, despite the substantial

empirical support for PMT treatments of CPs, relatively little is known about factors related to poor treatment

response, which is typically seen in one third to one half of treated cases (Murrihy et al., 2010;  Reyno &

McGrath, 2006; Ollendick, White, & White, 2018). More specifically, some studies have shown that while

improvements in disruptive behaviors are evident, up to half of treated cases still display clinical levels of

disruptive behaviors post treatment (Ollendick et al., 2016). The attrition rate for this population is also

relatively high (approaching 50%, see Nock & Ferriter, 2005) and the benefits that are obtained following

treatment are not always maintained over time (Lundahl, Risser, & Lovejoy, 2006).  It is, therefore, important to

understand the conditions under which PMT is most effective so that we can tailor interventions to ensure

maximum benefits for these youth and their families. To this end, examining moderators and predictors of

treatment outcome is vital as they assist in addressing these questions.

      Treatment moderators inform "for whom" or under "what conditions" the treatments work (Kraemer,

Wilson, Fairburn, & Agras, 2002). According to Kraemer and colleagues, moderator variables must be pre-

randomization characteristics in randomized clinical trials that can be shown to differentially predict treatment outcome. Generally, moderator variables are associated with the interaction effect between the proposed moderator variables and the different treatment conditions (Prins, Ollendick, Maric, & MacKinnon, 2015). These pre-treatment moderator variables have been referred to as "prescriptive indicators" (MacKinnon, Lockhart, Baraldi, & Gelfand, 2013) because they can provide information about whether two treatments differ from one another due to characteristics of the sample or the contexts under which the treatments are delivered. For example, a child of a parent with high levels of depression at pre-treatment may make more gains in an individualised versus group delivered PMT program. Pre-treatment knowledge of moderators enables the clinician to choose the most suitable treatment and to adjust and individualise it whenever possible (Prins et al., 2015).

Predictors also inform us *for whom* treatments work. Kraemer and colleagues (2002) specify that predictors are generally pre-treatment variables, but can also consist of post-treatment variables (e.g., treatment compliance) that are associated with treatment outcomes irrespective of treatment assignment. These predictor variables have been referred to as "prognostic indicators" (MacKinnon et al., 2013). Generally, predictor variables are associated with the main effects of the candidate variables. For example, a parent participating in treatment for their child's disruptive behavior may experience poor outcomes if they have high levels of depression at pre-treatment, regardless of what treatment they receive. In contrast, a moderator variable must interact with treatment assignment to specify for whom a specific treatment works. Importantly, not all predictor variables are moderators of treatment outcome (Kraemer et al., 2002; Ollendick, Jarrett, Grills-Taquechel, Hovey, & Wolff, 2008).

Parental and familial characteristics may have a significant impact on treatment outcomes of PMT interventions (e.g., Lundahl, Risser, & Lovejoy, 2006; Shelleby & Shaw, 2014. Parents play a crucial role in PMT interventions; they are the primary agents of change (Forgatch & Gewirtz, 2018), as they shape the child's behaviour through the effective implementation of behavior management principles. More specifically, parents are taught skills in how to interact with their child and how to implement the techniques provided to them in treatment with the goal of altering specific child-rearing practices that will lead to decreases in disruptive behaviors (Brainerd & Kazdin, 2005). It is therefore of utmost importance that we understand what pre-treatment parental and familial factors impact parents' ability to successfully engage and implement PMT strategies, in order to achieve optimal treatment outcomes.

Unfortunately, to date, relatively few studies have examined parental and familial predictors and moderators of treatment outcome for disruptive behaviors; as a result, Prins and colleagues (2015) recently described this movement as a "work in progress." Parental and familial characteristics that have most frequently been investigated include maternal depression, maternal stress, socioeconomic status (SES), and marital status (Brainerd & Kazdin, 2005; Menting et al., 2013). Less commonly examined characteristics include paternal indices of stress and depression, parental attributions for child misbehaviour, parental age, and substance use (Reyno & McGrath, 2006; Webster-Stratton, 1990; Sawrikar, Hawes, Moul, & Dadds, 2018). To date, results have been mixed, with few studies finding significant predictors of treatment outcome (e.g., Baruch, Vrouva, & Wells, 2011; Hartman, Stage, & Webster-Stratton, 2003; Reyno & McGrath, 2006), and even fewer reporting significant moderators of treatment outcome (e.g., Lundahl, Risser, & Lovejoy, 2006; Shelleby & Shaw, 2014). Here, we provide a brief overview of some of the early findings associated with family and parent characteristics, and then examine more recent findings.

*Family characteristics*

One of the strongest familial predictors found to influence treatment outcome for CPs in earlier studies was family income (e.g., Dumas, 1984; Kazdin, 1990; Lundahl et al., 2006; Reyno & McGrath, 2006). In a 2006 meta-analysis examining the predictors of treatment outcome for CPs, Reyno and McGrath (2006) found parent training to be less effective for economically disadvantaged families compared to their less disadvantaged counterparts. Similarly, in another early meta-analysis investigating the moderators of treatment outcome for CPs, Lundahl and colleagues (2006) found parent training was least effective for economically disadvantaged families and that such families benefited significantly more from individually delivered parent training compared to group delivery.

*Parental characteristics*

Maternal psychopathology is a commonly researched parental predictor of parent training outcomes (e.g., Hartman, Stage, & Webster-Stratton, 2003; Kazdin & Wassell, 2000; Shaw, Dishion, Supplee, Gardner, & Arnds, 2006), with studies once again yielding mixed findings. Children of parents who have higher levels of depressive symptoms have been found not to benefit as much from parent training when compared to children of parents with low levels of depression (Kazdin & Wassell, 2000; Reyno & McGrath, 2006). However, other studies have found the opposite effect, wherein higher levels of maternal depression have been shown to predict greater improvements in CPs (Shaw et al. 2006).

Mother-child relationship quality as a predictor of treatment outcome has also yielded mixed results in these earlier studies. Some have found the greatest benefits for children whose mothers reported lower mother–child relationship quality (Tein, Sandler, MacKinnon, & Wolchik, 2004), while others have found no significant effects for mother-child relationship on treatment outcome (Gardner, Connell, Trentacosta, Shaw, Dishion, & Wilson, 2009).

With respect to other parental characteristics, some studies have found the greatest benefits for children whose mothers reported low social support, and for children of mothers who reported greater marital discord and daily hassles (Van Zeijl et al., 2006). While others have found parental characteristics including life stress parental age, income/SES, or cumulative risk to either result in poor treatment response or have no impact on treatment outcome (Webster-Stratton, 1990).

Collectively, these studies suggest that the effect of familial and parental characteristics across treatments is not clear, with several moderation and predictor studies reporting non-significant results (see Shelleby & Shaw, 2014). The lack of consensus in the literature may be attributed to relatively few studies examining these variables. Others have suggested that variation in these results could be attributed to the different types and delivery modes of parenting programs examined. For example, the collaborative approach of some group programs, such as Incredible Years, may result in the tailoring of strategies to meet the specific characteristics and needs of the families (Leijten, Raaijmakers, Orobio de Castro, van de Ban, & Matthys, 2017). Others argue that for those most disadvantaged, an individualised therapy approach may be of most benefit (Lundahl et al., 2006).

Given the status of these earlier studies, the aim of the current review was to conduct an updated investigation into parental and familial factors as possible predictors or moderators of treatment outcome in youth with CPs. The outcome measures examined were changes in conduct problems in children and adolescents following PMT interventions. The earlier reviews by Lundahl and colleagues (2006) and Reyno and McGrath (2006) examined studies through 2003 to mid-2004, respectively, and were limited in their examination of moderators of treatment outcome (Lundahl et al., 2006). A more recent review examined a range of moderators through 2013, but was limited to young children between 1 and 10 years of age (Shelleby & Shaw, 2014). We set out to identify and systematically review the literature from the past 15 years (from mid-2004 to mid-2019). The current review examines all familial and parental predictors and moderators in treatments identified as PMT programs for youth between 3 and 16 years of age.

Method

This review was conducted in accordance with the PRISMA guidelines (Moher et al. 2009, 2015), and the review protocol was registered with PROSPERO [CRD42017058996].

**Inclusion and exclusion criteria**

The review included studies that reported treatment outcomes in parent management training for children and adolescents (3-16 years) with disruptive behavior problems (ODD, CD, and oppositional behaviors), and reported whether parental and familial characteristics were associated with (moderated or predicted) treatment outcomes. Children and adolescents with comorbid Attention Deficit-Hyperactivity Disorder (ADHD) or with other comorbid concerns, such as internalizing disorders, were included in the review provided the primary target for the intervention was externalizing conduct behavior problems. Intermittent Explosive Disorder was not included due to its more recent recognition as a disruptive behavior disorder in the Diagnostic Statistical Manual (DSM-5; American Psychiatric Association, 2013). In addition, the following specific inclusion criteria were employed: 1. Sample drawn from a randomised clinical trial (RCT); 2. Studies with a primary outcome measure of conduct behavior problems; 3. Studies reported a quantifiable measure of the association between predictor and/or moderator variables and treatment outcome measures; 4. The parent management training program was an identifiable program with the core components of parent management training being enlisted (e.g., praise, special time and cost contingency) to parents; 5. The sample contained at least 5 participants. Studies were excluded if the intervention was limited to teachers in school settings or for children with autism spectrum disorder or other developmental disabilities.

**Search strategy**

The primary search strategy involved searching four databases: PsychINFO, MEDLINE, SCOPUS and Cochrane Central Register of Controlled Trials (CENTRAL). The search terms were: externali*ing OR conduct OR behavio*r problems OR Oppositional OR antisocial OR disruptive OR non-compliance AND parent training OR parent* intervention OR parent management training OR treatment intervention AND predict* OR factors OR response OR outcome OR treatment outcome. Only peer-reviewed studies published between October 2004 and July 2019 were included. Retrieved studies were then filtered for age groups (only children and adolescents between 3 and 16 were included) and English language, followed by additional exclusion criteria (listed below). Our secondary search strategy included article search on Google Scholar as well as searching through the main online PMT libraries (Triple P, Incredible Years, PMTO and PCIT). Finally,

reference lists from included studies and previous literature reviews in the field were hand searched. Figure 1 represents a PRISMA flow diagram illustrating the selection process that followed.

**Study selection**

Following the initial search, abstracts and titles were screened to determine their relevance to this review. Studies that could be immediately excluded on the basis of title were discarded. For the remaining references, the first author (ADW) reviewed abstracts to assess compliance of studies with eligibility criteria. Full text manuscripts were then retrieved and evaluated against the inclusion criteria. The second author (SAD) reviewed a random subset of the full text manuscripts (20%). There was 86% agreement between ADW and SAD; disagreements were discussed and resolved. Two studies required further discussion with the last author (THO) and were resolved. The first author (ADW) coded and extracted all the data. The second author (SAD) checked a subset to ensure that all the extracted data were recorded and reported accurately. Information extracted from each study included: authors, year of study, original study from which the sample was drawn, age, gender and ethnicity of participants, intervention used, format (group or individual), sample size, measures used, criteria required for inclusion, follow up length, and risk of bias (shown in Table 1, Table 3 and Figure 2). The predictor/moderator variables examined and main findings were also extracted (shown in Table 2).

**Risk of bias in Individual Studies**

Risk of bias for the included studies was assessed using the Revised 'Risk of Bias' tool (RoB 2.0) developed by the Cochrane Collaboration (Higgins et al., 2016). This tool allowed assessment of potential sources of bias in each study, including (1) randomization process; (2) deviations from intended interventions; (3) missing outcome data (4) measurement of outcome; (5) selection of reported results and (6) reporting bias. Each category was coded as low, high or possessing some concerns as suggested by Higgins et al., 2016). The assessment of study quality was undertaken independently by ADW, with 20% of the analyses checked by SAD. Inter-rater reliability was estimated with Cronbach's alpha, with an overall bias level agreement of 1 and a Cronbach's alpha of .904 for agreement across the different types of biases. Disagreements were resolved though discussion.

**Data extraction**

Data extracted from included studies were recorded using a data extraction form designed for this review. Data included study details, study setting, sample characteristics, measures used, intervention format,

inclusion criteria, follow up length, risk of bias and predictors and moderators examined (see Table 1, Table 2 and Table 3).

**Data synthesis**

A narrative synthesis of the results was undertaken. Unfortunately, a meta-analysis was not feasible for this review due to the limited number of studies (n = 21) and the considerable heterogeneity of methods evident across studies. For example, there was great variability in the outcome variables used and statistical analyses employed, with some studies examining categorical end diagnostic state and others analysing dimensional levels of symptomatology. Further, considerable variability was evident in the type of PMT program implemented and whether it was delivered in group or individual format.

**Results**

[INSERT Fig 1- Prisma diagram, about here]

**Study Selection**

A total of 1827 records were examined. Five hundred and sixty-one records were removed as duplicates and a further 1109 were removed at title and abstract screening stage. This left 157 records that were examined as full text records, 136 of which were excluded leaving 21 studies for inclusion in the review. Figure 1 provides an account of the study selection process.

**Study characteristics**

Characteristics of the included studies, grouped by type of PMT intervention, are presented in Table 1**.** Of the 21 studies examining predictors and moderators of change, 10 reported on the Incredible Years intervention (Webster-Stratton & Reid, 2003). The remaining 11 interventions included other variations of parent management training including: Helping the Non-Compliant Child (McMahon & Forehand, 2003, *n = 2),* Communication Method (Kling et al., 2010, *n = 3),* Brief Parent Training (Askeland, Berg, Christiansen, Flock, & Launes, 2006, *n = 1)*, Defiant Child (Barkley, 2013, *n = 3),* Triple P (Sanders, 1999, *n = 1)*, and Parent Child Interaction Therapy (Brinkmeyer & Eyberg, 2003, *n = 1)*. Of the 21 studies included, 14 interventions were delivered in a group format and 7 were delivered individually. The majority of the studies were conducted in the United States *(n = 8),* followed by Norway *(n=4)*, Sweden (n=3), The Netherlands *(n=2)*, UK *(n=2)*, Portugal *(n=1)*, and New Zealand *(n=1)*.

**Research Design**

All 21 studies were RCTs, with 14 of the 21 studies comparing an intervention to an active control and the remaining seven to a waitlist control. Predictors were examined in 19 of the 21 studies, while moderators were examined in only 5 studies (with three of these studies examining the variables as both predictors and moderators). Within the 19 studies investigating predictors, an additional four studies indicated they had undertaken moderation analyses but in line with Kraemer and colleagues' (2002) definitions, they were more accurately predictor analyses and were subsequently analyzed as predictors only (Gardner, Hutchings, Bywater, & Whitaker, 2010; Leijten et al., 2017; Seabra-Santos et al., 2016; Weeland, Chhangur, van der Giessen, Matthys, de Castro, & Overbeek, 2017).

**Risk of Bias within Studies**

Risk of bias ratings are shown in Table 3 and Figure 2. The methodological quality of the studies varied greatly, with the majority of studies yielding acceptable levels of risk within the six bias indices. Ten studies (47%) reported adequate randomisation methods with nine studies (43%) presenting some limitations, mostly due to inadequate reporting of the specific randomisation method employed. The remaining two (10%) studies presented high levels of concern. The majority of the studies were classified as low risk of bias for deviations from intended interventions (76%), missing outcome data (90%), measurement of outcome (57%), and selection of reported results (90%). Overall, six studies were classified by reviewers as low risk on all six indices, four as low risk on four indices, seven studies as low risk on three measures and the remaining four studies as low risk on two bias measures. The overall risk of bias rating was categorised as low for six studies, some concerns for six studies and high potential risk of bias for nine of the 21 studies.

**Sample Characteristics**

Sample sizes per study ranged from 22 to 908. Children included in the studies ranged in age from 3 years to 14 years - none of the studies investigated children from 14 to 16 years. The majority of interventions were delivered to children whose average ages were between 3 and 8 years, with only six of the 21 studies including children above the age of 10 years. In 19 studies, the majority of the children were male. In terms of presentation criteria, a diagnosis of ODD was required for inclusion in six of the studies, four studies required children to display elevated levels of disruptive behaviors, and six required the child to reach a clinical cut off for disruptive behaviors on a parent-report measure such as the Eyberg Child Behavior Inventory (ECBI; Robinson, Eyberg, & Ross, 1980) or the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997). A

further two required both an ODD or CD diagnosis, as well as clinically significant levels on the ECBI. Finally, two studies required an ODD diagnosis or for the younger children to display elevated levels of disruptive behaviors, while for the remaining study children received treatment as part of usual services provided and did not require a listed diagnosis.

Child behavior outcome measures varied across studies. The majority of studies (16) used parent-report measures, most commonly the ECBI or the Child Behavior Checklist (CBCL; Achenbach, 1991a; Achenbach, 1991b). Thirteen of these studies relied solely on parent report measures for measuring treatment outcome. The presence of diagnosis was the primary outcome in five studies. Semi-structured interviews, such as the Anxiety Disorders Interview Schedule – child and parent version and (ADIS-C/P; Silverman & Albano, 1996) and the Diagnostic Interview Schedule for Children (Kiddie-SADS; Shaffer, Fisher, Lucas, Dulcan, & Schwab-Stone, 2000) were used in seven studies, however two of these studies used them to determine inclusion of participants rather than as an outcome measure. Only three used observational methods.  More than one criterion variable was used in 16 (76%) of the 21 studies.

[INSERT Table 1 about here]

**Predictor and Moderator Main Findings**

A synthesis of the moderator and predictor main findings is presented in Table 2.

**Do familial characteristics predict or moderate treatment outcomes?**

A variety of demographic and familial variables were examined as predictors of treatment outcome including SES, parental education, parental age, marital status and family composition.  These results are reported in detail below.

**Predictors:**

*Demographics:*

Ten studies examined whether SES predicted treatment outcome. Nine of these studies found that SES did *not* significantly predict outcomes following PMT treatment (Beauchaine, Webster-Stratton, & Reid, 2005; Dittman, Farruggia, Palmer, Sanders, & Keown, 2014; Gardner et al., 2010; Lavigne et al.,2008; Ollendick et al., 2016; Scott, 2005; Seabra-Santos et al., 2016; Stattin, Enebrink, Ozdemir & Giannotta, 2015; Werba, Eyberg, Boggs & Algina, 2006). One study found that in the control condition, higher SES predicted lower

levels of externalizing behavior over time; however, after controlling for multiple testing, SES did not significantly predict treatment outcome in that study (Weeland et al., 2017).

Parents' age was examined as a predictor in three studies with variable findings (Beauchaine, Webster-Stratton, & Reid, 2005; Fossum, Mørch, Handegård, Drugli, & Larsson, 2008; Werba et al., 2006). Of these studies, one found poorer outcome for children of younger mothers at post therapy (Werba et al., 2006), one found better outcomes for children of younger mothers at one year follow up (Beauchaine, Webster-Stratton, & Reid, 2005), while one did not report significant age-related differences (Fossum et al., 2008).

Parental education was not found to be a significant predictor of treatment outcome. Non-significant results were found in seven studies examining parent education (Beauchaine, Webster-Stratton, & Reid, 2005; Dittman et al., 2014; Drugli, Fossum, Larsson & Mørch, 2010; Fossum et al., 2008; Lavigne et al., 2008; Leijten, Raaijmakers, de Castro, van den Ban & Matthys, 2017; Scott, 2005). An additional study looking at maternal IQ (Werba et al., 2006) also failed to show significant findings.

Marital status was assessed in eight studies (Beauchaine, Webster-Stratton, & Reid, 2005; Drugli, Fossum et al., 2010; Drugli, Larsson, Fossum, & Mørch, 2010; Fossum et al., 2008; Gardner et al., 2010; Lavigne et al., 2008; Scott, 2005; Werba et al., 2006). Only one of these studies found it to be a significant predictor - living with mother alone predicted ODD/CD diagnosis at 5-6 year follow up only (Drugli, Larsson et al., 2010). Family composition, including the number of children in the family, was investigated in two studies. No significant results were found in either study (Weeland et al., 2017; Werba et al., 2006). Four studies examined race/ethnicity as a predictor of treatment outcome with no significant findings (Lavigne et al., 2008; Leijten et al., 2017; Ollendick et al., 2016; Scott, 2005).

*Other family characteristics*

Shorter pregnancy and having contact (versus no contact) with child protection services were examined as predictors in one study each. While there were no significant findings for shorter pregnancy (Scott, 2005), having contact with child protection services was found to predict treatment nonresponse at 1-year follow-up in one study (Drugli, Fossum et al., 2010). Marital adjustment and satisfaction revealed no significant findings in the two studies in which they were examined (Beauchaine, Webster-Stratton, & Reid, 2005; Werba et al., 2006).

**Moderators:**

*Demographics:*

SES was investigated as moderator of treatment outcome in three studies (Beauchaine, Webster-Stratton, & Reid, 2005; Lavigne et al., 2008; Stattin et al., 2015). These studies included a waitlist control or minimal intervention bibliotherapy group and other active treatments. Lavigne and colleagues compared a minimal intervention bibliotherapy group to a nurse led versus psychologist led IY intervention, while others examined whether SES was differentially influenced by four active treatments (IY, Cope, COMET, Connect) and a wait list control (Stattin et al., 2015). Beauchaine and colleagues used a combined analysis of 6 RCTS with a wait list control group and a comparison of three different IY programs (parent training, child training and teacher training). These programs were delivered as either separate interventions or were combined (e.g., child training and teacher training). In behavior observation models it was found that children who were below the sample median on social class, fared best at one year follow up when the parent training (PT) and child training (CT) component were both included in the IY intervention (Beauchaine, Webster-Stratton, & Reid, 2005). There were no significant moderation effects found in the other study (Stattin et al., 2015). Of the three studies examining parental age, no significant moderation effects were found (Beauchaine, Webster-Stratton, & Reid, 2005; Kling et al., 2010; Stattin et al., 2015). Parental education also yielded no significant results in the three studies in which it was examined (Beauchaine, Webster-Stratton, & Reid, 2005; Kling et al., 2010; Lavigne et al., 2008). However, one of these studies initially yielded a statistically significant interaction for maternal education, but the cell sizes were too small, and the results were not interpreted further (Lavigne et al., 2008). Three studies examined race/ethnicity as a moderator, with no significant findings (Kling et al., 2010; Lavigne et al., 2008; Stattin et al., 2015).

Overall, marital status was not a moderator of treatment outcome (Kling et al., 2010; Lavigne et al., 2008; Stattin et al., 2015). Of the four studies examining marital status, only one study found a significant result - children of unpartnered mothers showed better outcomes at one year follow up when the PT or CT components of the IY intervention were included in treatment than when they were not (Beauchaine, Webster-Stratton, & Reid, 2005). Marital adjustment was also examined in one study (Beauchaine, Webster-Stratton, & Reid, 2005). This study found that interventions including the parent training component of IY resulted in better one year outcomes than when parent training was not included for children of mothers reporting low marital adjustment (Beauchaine, Webster-Stratton, & Reid, 2005). In sum, there is currently little to no evidence to suggest that family demographics such as SES, parental education, parental age, race/ethnicity, marital status and marital satisfaction moderate treatment outcomes.

**Do parental characteristics predict or moderate treatment outcomes?**

Overall, the results on the association between parental characteristics and treatment outcome are similarly inconsistent and/or inconclusive. There were no significant findings for maternal locus of control, parenting confidence, parent attributions of child misbehavior, child maltreatment risk, tolerance for misbehavior, father participation, or mother receiving treatment for a psychiatric disorder. Some support was found for parenting behaviors, parental substance abuse, emotion dysregulation and socialization, with significant findings only present in single studies. Strong support was, however, found for a positive parent-child relationship and interactions, which predicted better treatment outcomes. Specifically, fewer behavioral problems, less aggression and emotional lability were reported following treatment (Dittman et al., 2014; Lavigne et al., 2008; Miller-Slough, Dunsmore, Ollendick & Greene, 2016). There was also some evidence to support an association between treatment outcome and maternal stress and depression, however, these findings were inconsistent (Drugli, Larsson et al. 2010; Fossum et al., 2008; Gardner et al., 2010; Werba et al., 2006). Robust support was found for high maternal distress predicting poor treatment outcome. Finally, some support was also found for maternal stress moderating treatment outcome (Kjøbli, Nærde, Bjørnebekk & Askeland, 2014). These findings are examined in more detail below.

**Predictors:**

*Maternal stress*

Six studies investigated whether maternal stress predicted treatment outcome. This included measures of life stress and parenting stress. Two studies found high levels of maternal stress to significantly predict worse treatment outcome at post-therapy (Fossum et al., 2008; Werba et al., 2006), as well as dropout rates (Werba et al., 2006). At 12 months follow up, one study found lower maternal stress to have better treatment outcomes (Lavigne et al., 2008), while high initial levels of stress predicted greater gains following treatment. (Lavigne et al., 2008). Specifically, mothers reporting higher levels of pre-treatment life stress had children who displayed more ODD-related symptoms at pre-treatment and at follow up compared to mothers with lower levels of initial life stress. However, children of mothers with high levels of initial life stress made greater improvements on the ECBI following treatment. Another study examining outcomes 5-6 years after treatment found high levels of maternal stress at post-treatment to predict a worse outcome, although this did not remain significant after controlling for other baseline characteristics (Drugli, Larsson et al. 2010). Parental stress was subsequently identified as a risk factor, whereby parental stress may increase the risk for maintaining an ODD/CD diagnosis

as opposed to significantly predicting a child maintaining a diagnosis of ODD/CD 5–6 years after treatment (Drugli, Larsson et al. 2010).

Maternal distress was found to significantly predict treatment outcome in each of the two studies in which it was examined (Kjøbli et al., 2014; Lavigne et al., 2008). High maternal distress significantly predicted poorer treatment outcomes from teacher (Kjøbli et al., 2014) and parent ratings (Kjøbli et al., 2014; Lavigne et al., 2008). These significant findings were reported at post-therapy (Kjøbli et al., 2014; Lavigne et al., 2008) and 12 months following treatment (Lavigne et al., 2008). In terms of treatment gain, Lavigne and colleagues (2008) found higher levels of parental distress predicted greater gains at 12 months follow up than parents reporting less parental distress. That is, children of parents experiencing lower levels of pre-treatment distress made less improvements, but they displayed fewer behavior problems at 12 month follow up than children of parents who were more distressed.

*Maternal depression*

Ten studies investigated maternal depression as a predictor of treatment outcome (Beauchaine, Webster-Stratton, & Reid, 2005; Dittman et al., 2014; Drugli, Larsson et al., 2010; Fossum et al., 2008; Gardner et al., 2010; Lavigne et al., 2008; Parent, Forehand, Merchant, Long & Jones, 2011; Scott, 2005; Seabra-Santos et al., 2016; Werba et al., 2006) and one study examined both maternal and paternal depression (Eckshtain, Marchette, Schleider, Evans & Weisz, 2019. In terms of maternal depression, three of these studies found maternal depression to be a significant predictor of treatment outcome. More specifically, two studies found that maternal depression predicted better outcomes following PMT intervention, relative to the control group who experienced poorer outcomes (Gardner et al., 2010) and at two month follow up (Parent et al., 2011). Interestingly, while Eckshtain and colleagues (2019) found no significant association between levels of initial parental depression and treatment outcome at post therapy, children of parents with elevated levels of depression improved at a significantly faster rate than children of parents with lower initial levels of depression.

*Other parental characteristics*

A number of other parental predictors have been examined; however, these have been reported only in single studies and, overall, yielded no significant results. These non-significant parental predictors included: mother receiving treatment for a psychiatric disorder (Drugli, Fossum et al., 2010); maternal locus of control (Werba et al., 2006); parenting confidence (Dittman et al., 2014); parental attribution of child misbehaviour (Dittman et al., 2014); child maltreatment risk and tolerance for child misbehavior (Dittman et al., 2014; Werba

et al., 2006), and father participation (Dittman et al., 2010). The exceptions to this include parental substance abuse which was found to significantly predict more positive treatment responses (Beauchaine, Webster-Stratton, & Reid, 2005) and to caregiver emotion dysregulation and socialisation practices; high levels of emotion dysregulation and socialisation significantly predicted poorer outcomes and longer treatment duration. (Zachary, Jones, McKee, Baucom & Forehand, 2017).

*Parent-child interactions/relationship*

Parent-child interactions, including relationship quality, was investigated as a predictor in three studies, each yielding significant findings: A more positive parent-child relationship predicted less behavior problems at post treatment (Dittman et al., 2014; Lavigne et al., 2008), as well as at 12 month follow up (Lavigne et al., 2008). Parent-child interactions, in the form of "parent-child synchrony," was examined by Miller-Slough and colleagues (2016). Parent–child synchrony, defined as the ability of a parent–child dyad to share meaning and perspective on events, is characterized by active engagement, shared understanding, and willingness to listen to each other (Laible & Song, 2006). Parent-Child synchrony at pre-treatment was associated with lower emotional lability and less aggression at the end of treatment (Miller-Slough et al., 2016).

*Parenting behaviors*

The association between parenting behaviors and treatment outcome also yielded few significant findings. Of the three studies investigating parenting style (Drugli, Fossum et al., 2010) and behaviors (Dittman et al., 2014; Werba et al., 2006), only one study found that parenting behavior, specifically, criticism and sarcasm observed during parent-child interactions, predicted treatment drop out and poorer treatment outcome (Werba et al., 2006). No other associations were reported. Related to parenting behavior, a parent's willingness to complete homework tasks given during treatment was examined in a single study (Högström, Enebrink, Melin, & Ghaderi, 2014). More specifically, completion of homework promoting positive behaviors and homework intended to reduce negative behaviors was examined as a predictor of treatment success (Högström et al., 2014). Pre to post improvement was predicted by parents' implementation of homework assignments intended to reduce negative behavior.

**Moderators:**

*Maternal stress/distress:*

Two studies investigated maternal stress as a moderator of treatment outcome with no significant findings reported (Beauchaine, Webster-Stratton, & Reid, 2005; Lavigne et al., 2008). In addition, mental distress was assessed in two studies (Kjøbli et al., 2014; Lavigne et al., 2008). One of these studies found a significant moderation - lower levels of maternal distress and high levels of CPs differentially predicted treatment outcomes for the intervention group versus the treatment as usual group, specifically lower levels of distress predicted better outcomes for the intervention group (Kjøbli et al., 2014).

*Maternal depression:*

Maternal depression was assessed in two studies, with one study finding it to significantly differentiate between two different interventions (Beauchaine, Webster-Stratton, & Reid, 2005; Lavigne et al., 2008). Children of mothers scoring above the sample median of 8 on the BDI fared better at one year follow up in conditions that included PT or CT, than in conditions that did not include PT or CT (Beauchaine, Webster-Stratton, & Reid, 2005).

*Other parental characteristics:*

Parent-child interactions were examined in a single study, with no significant findings (Lavigne et al., 2008). Parental substance abuse was also examined in single study and was found to significantly moderate treatment outcome, whereby children who had fathers with a history of substance abuse had better outcomes at one year follow up when PT or CT was included in their treatment than when it was not included.

[INSERT Table 2 about here]

Discussion

The aim of the current review was to update Lundahl and colleagues' (2006) and Reyno and McGrath's (2006) earlier reviews in this area of inquiry. These early reviews examined a range of parenting interventions that included various PMT interventions. In addition, the more recent review by Shelleby and Shaw (2014) examined parenting interventions in a restricted age range (e.g., 1 - 10 years). To address these shortcomings and to update the findings, studies from the past 15 years on parental and familial predictors, as well as moderators, of treatment outcome were examined in the current review.

*Main findings:* Even though demographic characteristics were examined in 10 of the 21 studies, very few significant findings were reported. For example, SES was most commonly examined, however, none of the 10 studies in which it was included found it to significantly predict treatment outcome. Only one study

examined SES as a moderator, whereby children of lower SES demonstrated greater treatment benefit at 1 year follow up if they were given both the parent training and child training components of the IY intervention (Beauchaine, Webster-Stratton, & Reid, 2005). Overall, studies published in the last 15 years have not found financial disadvantage to be associated with treatment response as previously suggested (e.g., Gardner et al., 2010; Ollendick et al., 2016). These findings are in contrast to Lundahl and colleagues' (2006) and Reyno and McGrath's (2006) earlier conclusions which indicated parent training was less effective for economically disadvantaged families. Perhaps this difference in findings over time can be accounted for by the differing levels of problem severity examined across studies. However, in the current review, initial problem severity varied across studies as indicated by the different inclusion criteria used. For example, some required a diagnosis of ODD for study inclusion, while others required a demonstration of elevated levels of disruptive behavior, most commonly determined by a clinical cut-off score on a parent-report measure. Others were identified as "at risk" of developing conduct problems. Interestingly, recent studies have found that when controlling for initial problem severity, financial disadvantage does not influence treatment outcomes even when initial problem behaviors are severe. That is, disadvantaged SES and non-disadvantaged SES participants benefited equally from parent training. However, disadvantaged SES participants benefited less from parent training when the initial problem behaviors were mild and less severe (Leijten et al., 2013; Shelleby & Shaw, 2014). Although speculative, this finding may be explained by less motivation to change in these families with less room for improvement. It also suggests that initial problem severity may be especially meaningful to assess in disadvantaged families.

Similarly, while Reyno and McGrath (2006) found low education/occupation to predict treatment outcome, parental education yielded no significant results in the three studies in which it was examined for the current review. When maternal age was investigated, the findings showed greater variability. Paradoxically studies reported both poorer and better outcomes for children of younger mothers (Beauchaine, Webster-Stratton, & Reid, 2005; Werba et al., 2006), while others found maternal age not to impact treatment outcome (Fossum et al., 2008).

Results regarding parental psychopathology were also at odds with previous meta-analyses (Reyno & McGrath, 2006). Examination of parental psychopathology varied across studies, with most only examining maternal (not paternal) psychopathology. Maternal stress, depression, and distress each differed in reported findings. There was some evidence to suggest that higher levels of maternal stress predicted poorer outcomes post-treatment and at 12 months follow up (Fossum et al., 2008; Werba et al., 2006). However, despite these

findings, the number of studies examining maternal stress was small with most studies examining maternal stress finding that it did not predict treatment outcome (Beauchaine, Webster-Stratton, & Reid, 2005; Drugli, Larsson et al., 2010).

Overall, no association between maternal depression and treatment outcome was found, despite it being the most consistently examined variable within the reviewed studies (12 of 21 studies). Surprisingly, and again in contrast to the previous meta-analyses, more recent studies suggest that interventions are equally effective for parents reporting a high level of stress and symptoms of depression compared to those experiencing lower levels of stress and depression (e.g., Beauchaine, Webster-Stratton, & Reid, 2005; Dittman et al., 2014; Fossum et al., 2008; Drugli et al., 2010; Lavigne et al., 2008; Scott, 2005; Seabra-Santos et al., 2016; Werba et al., 2006). However, when high maternal stress and depression were examined in combination, some support was found for their ability to predict poor treatment outcome (Kjøbli et al., 2014; Lavigne et al., 2008). This may be explained within a cumulative risk model framework (e.g., Rutter, 1979). For example, it may be that depression and stress have a cumulative effect on the parent's ability to cope with demands and, therefore, successfully engage and implement the parent training. That is, the combined effect of depression and stress may increase the likelihood of finding an effect when compared to assessing the effects of these risk factors (i.e., depression and anxiety) separately (Rutter, 1979). While this is a potentially promising avenue in terms of further improving our understanding of treatment predictors, the studies are limited and, in the absence of further research, conclusions are tentative rather than definitive.

Support for parent child-interactions are arguably the clearest finding in the current review. All three of the studies examining parent-child relationships and parent-child interactions found that better treatment outcomes were predicted by a positive parent-child relationship and parent-child interactions (Dittman et al., 2014; Lavigne et al., 2008; Miller-Slough et al., 2016). These findings support previous research that oppositional behavior may be viewed within a transactional or reciprocal model, whereby problematic behaviors occur when there is a mismatch, or incompatibility, between child characteristics and parental expectations of the child (Greene, Ablon, & Goring, 2003). Moreover, closing the gap between child characteristics and parental expectations has been found to lead to fewer problematic behaviors (Greene, 1999; see also Greene & Winkler, 2019). It follows that a more positive parent-child relationship, with fewer incompatibilities before commencing treatment, would lead to better outcomes. This was found in the studies examined in this review (Dittman et al., 2014; Lavigne et al., 2008; Miller-Slough et al., 2016), as well as being well documented in the wider literature

(e.g., Booker, Ollendick, Dunsmore & Greene, 2016). Despite this, further replication is needed before definitive conclusions can be reached.

In sum, only tentative conclusions can be drawn regarding specific parental and familial characteristics, as well as processes that predict or moderate treatment outcome for parent management training. This was somewhat surprising considering previous reviews that were able to identify such characteristics more definitively (Lundahl, Risser, & Lovejoy, 2006; Reyno & McGrath, 2006). The difference in findings may, at least partially, be accounted for by the smaller number of studies identified in the current review (21) versus those examined by Lundahl and colleagues (2006) and Reyno and McGrath (2006) (63 and 31, respectively). Importantly, few of these earlier reviews included familial and parental variables. Lundahl and colleagues (2006), for example, only examined two familial/parental moderator variables- SES and single parenthood - meaning that while the number of studies examined was greater, the variables analyzed were limited. Interestingly, our findings for moderators was similar to the more recent review with younger children that also found little consistent evidence for differential effectiveness for treatments across sociodemographic and family processes (Shelleby & Shaw, 2014). Nevertheless, the smaller pool of studies in the current review may have reduced the capacity to find consistent patterns of results, and, therefore, to make definitive conclusions. Further research into parental and familial predictors and moderators is greatly needed.

While a significant amount of research has been conducted since the 2006 reviews (see Figure 1), the majority of this research has not explored parental and family processes. For example, and surprisingly so, Triple P and PCIT only examined such variables in one of the reviewed studies each (Dittman et al., 2014; Werba et al., 2006). Interestingly, previous reviews also identified very few PCIT and Triple P studies examining parental and familial predictors and moderators; specifically, only three Triple P and five PCIT studies were identified in the earlier reviews (Bor, Sanders & Markie-Dadds, 2002; Brestan, Eyberg, Boggs & Algina, 1997; Capage, Bennett, & McNeil, 2001; Eyberg, Boggs, & Algina, 1995; Hoath & Sanders, 2002; Hood & Eyberg, 2003; Lundahl, Risser, & Lovejoy, 2006; McTaggart & Sanders, 2007; Reyno & McGrath, 2006; Schuhmann, Foote, Eyberg, Boggs, & Algina, 1998; Shelleby & Shaw, 2014). In addition, similar to the current review, parental and familial predictors and moderators were most typically examined by IY studies, with ten being identified (Gross, Fogg, & Tucker, 1995; Tucker, Gross, Fogg, Delaney & Lapporte, 1998; Webster-Stratton, 1982a; Webster-Stratton;1982b; Webster-Stratton, 1984; Webster-Stratton, 1990; Webster-Stratton, 1992; Webster-Stratton, 1998; Webster-Stratton and Hammond, 1997; Webster-Stratton, 1998).

As previously mentioned, parents play a crucial role in PMT interventions - they are the primary agents of change - therefore, identifying pre-treatment characteristics that may impact their ability to successfully engage, participate in, and implement treatment is vital to increasing our understanding of the mechanisms of change and how to improve treatment outcomes. Thus, it is imperative that future research continue to systematically identify variables that both are conceptually and empirically associated with treatment outcomes (Prins et al., 2015) and that this examination is conducted across all types of PMT.

*Limitations*

Methodological features may be important in accounting for our differential findings (Wilson & Lipsey, 2001). In the current review, child conduct outcomes were examined, utilizing different methods across different studies to measure similar behaviors. For example, some studies looked at categorical outcomes, such as the presence of a diagnosis using clinician-rated semi-structured interview measures, while others used observational measures and parent-report measures. Dimensional ratings from parents or teachers were the most frequently employed in the majority (62%) of the studies in the current review. This may have resulted in a treatment bias effect, whereby participants may have overestimated rates of improvement due to demand characteristics and the desire to demonstrate improvement (Loerinc, Meuret, Twohig, Rosenfield, Bluett, & Craske, 2015; Reyno & McGrath, 2006). Furthermore, specific parent-rated dimensional scales, such as the ECBI, are usually more precise and sensitive to change and, therefore, more likely to identify predictors of treatment outcome (Steketee & Chambless, 1992). This was reflected in the current review with 73% of studies that employed the ECBI as an outcome measure, yielding significant findings. This included studies that used more than one outcome measure but only attained a significant finding on the ECBI (e.g., Fossum et al., 2008). In addition, while only a small number of studies employed direct behavioral observations as an outcome measure, it has been suggested that such measures may be more sensitive to intervention effects in comparison to parent reports of child behaviour (Scott, 2001). Quite obviously, use of different outcome measures across studies can be problematic, making it difficult to meaningfully synthesise and interpret data.

A further limitation is that over a third of the studies included in the present review may have been underpowered (n < 100), making it difficult to ascertain whether the results reflect effects associated with true prediction or moderation. Further, compounding this, most papers did not report effect sizes, again making it difficult to interpret the magnitude of findings. Additionally, relatively few predictors were examined, with even fewer moderators. An early study by Lavigne and colleagues (2008) may be considered exemplary as a

predictor and moderator study. In this study, participants received either a minimal intervention bibliotherapy treatment or the Incredible Years program led by a nurse or psychologist. More than one outcome measure was used, with data collected from different informants, including a semi-structured interview, parent self-report measures and videotaped observations of parent-child interactions. In addition, a range of predictors and moderators were explored. They included previously identified risk factors such as SES and maternal depression (Burke, Loeber, & Birmaher, 2004; Murrihy et al., 2010), as well as variables such as parental commands and parent-child interactions, which are specifically targeted during these interventions. Unfortunately, their sample size was moderate (n = 117), making it more difficult to detect moderation.

In another exemplary effort, Beauchaine and colleagues (2005) aggregated six Incredible Years studies which resulted in a large sample size (n = 514). They also examined a range of parental and familial characteristics as predictors and moderators and were able to detect significant findings for both. That is, (younger) age and parental substance abuse history predicted better outcomes one-year post treatment. In addition, SES, maternal depression, single parent status, history of parental substance abuse and low marital adjustment, moderated treatment outcome. Collectively, these studies may provide a sound methodological framework for the examination of predictors and moderators to maximize the likelihood of attaining valuable findings.

It should be noted that with the over-representation of IY studies may also influence findings in the current review. For example, different components of parent training, such as the use of time-out and increasing positive parent–child interactions, have been found to be more effective than others (Kaminski, Valle, Filen, & Boyle, 2008). It is possible that treatment characteristics that are specific to the intervention may account for some of the variability in the findings of the current review because PMT interventions vary in their program content and delivery.

The results of this review need to be interpreted in the context of additional limitations. First, for practical reasons, only studies that were published in English were included. Second, our search was restricted to a limited set of databases (PsychINFO, MEDLINE, SCOPUS and CENTRAL). Although we attempted to address this by examining the reference lists of previous reviews, as well as searching online PMT libraries and Google Scholar, we may have inadvertently omitted articles that met our inclusion criteria because of our restricted search. The exclusion of Intermittent Explosive Disorder may have also resulted in the identification of fewer potentially relevant studies. A related limitation is that there were relatively few studies that met the

inclusion criteria. This made it difficult to interpret and integrate the data. Furthermore, due to the characteristics of the studies, it was not possible to conduct a meta-analysis, which is the preferable method of data synthesis taking account of effect sizes and sample sizes of the individual studies. Also, the quality of the studies varied, with 18 of the studies rated as having low risk of bias on three or more individual categories (see Figure 2). However, for the overall risk of bias ratings, nine of the studies were assessed as having high concerns for risk of bias and six studies were assessed as having some concerns. The main potential source of bias was contained in the measurement of the outcome domain. This was largely attributed to outcome assessors not being blinded to intervention assignments. For example, the majority of the studies used parent self-report measures, and in some studies, the assessor was either aware of the intervention status or it was not clear if the assessors were aware of the intervention status. Findings must therefore be interpreted within the context of these potential limitations. However, a strength was that a risk of bias analysis was conducted. In addition, adding to previous research and in contrast to previous reviews (i.e., Lundahl et al., 2006; Reyno & McGrath, 2006), the examination of parental and familial variables in relation to child outcomes of PMT, was unrestricted. This review clearly identifies an important gap in the literature and highlights the need for future studies to examine both predictors and moderators that include parental and familial characteristics.

*Future directions*

Further research into the impact of parental factors in the treatment of CPs would be of benefit to advance the field and improve interventions to better serve the needs of families of children with CPs. In order to advance our understanding of how we improve the rates of treatment response, we need to routinely examine predictors and moderators in all future RCTs. Although it is encouraging that a number of risk factors explored in the current review did not differentially impact PMT effectiveness, it does not further our understanding as to why some families respond and other families fail to respond following treatment. Perhaps, the literature has yet to identify the most salient predictors and moderators, or those that show promising results require further investigation and replication (e.g., parent-child interactions). For example, father and mother involvement in parent training has been identified as resulting in significantly more positive change in child behavior and desirable parenting practices, compared with mother-only programs (Lundahl, Tollefson, Risser, & Lovejoy, 2008). Yet, research exploring parenting interventions has typically focused solely on mothers, with many relying on maternal reported outcome measures (e.g., Kjøbli et al., 2014; Scott, 2005; Seabra-Santos et al., 2016; Werba et al., 2006). Father participation may be critical for determining intervention effectiveness, especially so for parenting interventions for child conduct problems, and further research to clarify this would be

beneficial (Tully et al., 2017). On the other hand, it should not be overlooked that parenting/familial variables are not the only predictors of parenting interventions - child characteristics (e.g., initial problem severity, comorbidity) or process related factors (e.g., lack of engagement in intervention or poor therapeutic alliance) may also account for why many participants do not respond to parenting interventions.

Future studies should also consider the need for consistency in measurement across studies. As previously mentioned, outcome measures used in the studies in this review varied greatly, making it difficult to synthesize the findings. In addition, future research would benefit from standardized inclusion criteria. For example, child conduct problems at pre-treatment have been shown to predict parent training effectiveness (e.g., Leijten et al., 2013; Weisz, Sandler, Durlak, & Anton, 2005), with studies requiring a diagnosis likely containing participants with more severe initial conduct problems compared to those relying on parent reported questionnaires of behavior. Statistically, individuals with more severe problems before beginning treatment have a larger scope for improvement and, thus, increase the likelihood of obtaining larger effects (Shelleby & Shaw, 2014). Clinically, families that are troubled the most by their child's behaviors are also more likely to see the importance of engaging in the parent training and may be more motivated to get the most out of the experience (Leijten et al., 2013), as reflected through higher attendance rates and treatment adherence (Baydar, Reid, & Webster-Stratton, 2003). Future studies may therefore aid the development of our understanding of treatment predictors and moderators by using similar populations across studies, specifically, with similar initial levels of conduct problem severity.

Finally, it would be useful to explore alternative methods of parent training that address variables, such as parent-child relations, that have been shown by this review as the most reliable predictors of treatment outcomes (Dittman et al., 2014; Lavigne et al., 2008; Miller-Slough et al., 2016). Emanating from the belief that ODD-related behaviors stem from parent–child incompatibility, Collaborative and Proactive Solutions (CPS; previously referred to as Collaborative Problem Solving, Greene 2011; Greene & Winkler, 2019) may be a viable treatment option for oppositional children and their families (Greene & Winkler, 2019; Ollendick et al., 2016). Within this model, parent-child incompatibility refers to instances where parental expectations being placed upon a child outstrip the child's skills to respond adaptively, resulting in disruptive behaviors (Greene & Winkler, 2019). Parent-child incompatibility is directly addressed by CPS through a process of collaborative problem solving. Examination of predictor and moderator variables are desperately needed in comparing this approach to standard PMT approaches.

In sum, future research may benefit from routinely examining a range of predictors and moderators, including parental and familial characteristics. Also, standardization of research methodology (e.g., outcome measures) would assist in the synthesis of findings across studies, thereby increasing our understanding of predictors and moderators of treatment outcome in children presenting with CPs. Finally, alternative interventions to PMT that specifically address factors that have been identified as impacting treatment outcome should be considered.

References:

Achenbach, T. M. (1991a). *Manual for the Child Behavior Checklist/4-18 and 1991 profile*. Burlington, VT:
University of Vermont, Department of Psychiatry.

Achenbach, T. M. (1991b). *Manual for the Teacher's Report Form and 1991 profile*. Burlington, VT: University
of Vermont, Department of Psychiatry.

Ahrons, C. R. (1981). The continuing coparental relationship between divorced spouses. *American Journal of
Orthopsychiatry, 51*(3), 415, https://doi.org/10.1111/j.1939-0025.1981.tb01390.x

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4 ed.).
Washington, DC: Author.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5 ed.).
Arlington, VA: Author.

Askeland, E., Berg, E., Christiansen, T., Flock, M., & Launes, E. (2006). Handbook of brief parent
training. *Oslo, Norway: The Norwegian Center for Child Behavioral Development*.

Barkley, R. A. (2013). *Defiant children: A clinician's manual for assessment and parent training* (3rd ed.). New
York, NY: The Guilford Press.

Baruch, G., Vrouva, I., & Wells, C. (2011). Outcome findings from a parent training programme for young
people with conduct problems. *Child and Adolescent Mental Health*, *16*(1), 47-54,
https://doi.org/10.1111/j.1475-3588.2010.00574.x

Baydar, N., Reid, M. J., & Webster-Stratton, C. (2003). The role of mental health factors and program
engagement in the effectiveness of a preventive parenting program for Head Start mothers. *Child
Development, 74*(5), 1433-1453, https://doi.org/10.1111/1467-8624.00616

*Beauchaine, T. P., Webster-Stratton, C., & Reid, M. J. (2005). Mediators, moderators, and predictors of 1-year
outcomes among children treated for early-onset conduct problems: A latent growth curve analysis.
*Journal of Consulting and Clinical Psychology, 73*(3), 371-388, https://doi.org/10.1037/0022-
006X.73.3.371

Beecham, J. (2014). Annual research review: Child and adolescent mental health interventions: A review of
progress in economic studies across different disorders. *Journal of Child Psychology and Psychiatry,
55*(6), 714-732, https://doi.org/10.1111/jcpp.12216

Booker, J. A., Ollendick, T. H., Dunsmore, J. C., & Greene, R. W. (2016). Perceived pParent–child relations, conduct problems, and clinical improvement following the treatment of oppositional defiant disorder. *Journal of Child and Family Studies, 25*(5), 1623-1633, https://doi.org/10.1007/s10826-015-0323-3

Bor, W., Sanders, M. R., & Markie-Dadds, C. (2002). The effects of the Triple P-Positive Parenting Program on preschool children with co-occurring disruptive behavior and attentional/hyperactive difficulties. *Journal of Abnormal Child Psychology, 30*(6), 571-587, https://doi.org/10.1023/a:1020807613155

Brainerd, C. J., & Kazdin, A. E. (2005). *Parent management training : Treatment for oppositional, aggressive, and antisocial behavior in children and adolescents*. Retrieved from https://ebookcentral.proquest.com

Brestan, E. V., Eyberg, S. M., Boggs, S. R., & Algina, J. (1997). Parent-child interaction therapy: Parents' perceptions of untreated siblings. *Child & Family Behavior Therapy, 19*(3), 13-28, https://doi.org/10.1300/J019v19n03_02

Brinkmeyer, M. Y., & Eyberg, S. M. (2003). Parent-child interaction therapy for oppositional children. In *Evidence-based psychotherapies for children and adolescents.* (pp. 204-223). New York, NY: The Guilford Press.

Burke, J. D., Loeber, R., & Birmaher, B. (2004). Oppositional defiant disorder and conduct disorder: a review of the past 10 years, part II. *Focus, 2*(4), 558-576, https://doi.org/10.1176/foc.2.4.558

Christenson, J. D., Crane, D. R., Malloy, J., & Parker, S. (2016). The cost of oppositional defiant disorder and disruptive behavior: A review of the literature. *Journal of Child and Family Studies, 25*(9), 2649-2658, https://doi.org/10.1007/s10826-016-0430-9

Colder, C. R., Scalco, M., Trucco, E. M., Read, J. P., Lengua, L. J., Wieczorek, W. F., & Hawk, L. W. (2013). Prospective associations of internalizing and externalizing problems and their co-occurrence with early adolescent substance use. *Journal of Abnormal Child Psychology, 41*(4), 667-677, https://doi.org/10.1007/s10802-012-9701-0

Capage, L. C., Bennett, G. M., & McNeil, C. B. (2001). A comparison between African American and Caucasian children referred for treatment of disruptive behavior disorders. *Child & Family Behavior Therapy*, *23*(1), 1-14, https://doi.org/10.1300/J019v23n01_01

Dadds, M., & Hawes, D. (2006). *Integrated family intervention for child conduct problems: A behaviour-attachment-systems intervention for parents*. Australian Academic Press.

Danforth, J. S. (1998). The outcome of parent training using the behavior management flow chart with mothers and their children with oppositional defiant disorder and attention-deficit hyperactivity disorder. *Behavior Modification, 22*(4), 443-473, https://doi.org/10.1177/01454455980224001

Deković, M. A. J. A., & Stoltz, S. E. M. J. (2015). Moderators and mediators of treatments for youth who show externalizing problem behavior. *Moderators and mediators of youth treatment outcomes*, 97-122, https://doi.org/10.1093/med:psych/9780199360345.003.0005

*Dittman, C. K., Farruggia, S. P., Palmer, M. L., Sanders, M. R., & Keown, L. J. (2014). Predicting success in an online parenting intervention: The role of child, parent, and family factors. *Journal of Family Psychology, 28*(2), 236-243, https://doi.org/10.1037/a0035991

*Drugli, M., Fossum, S., Larsson, B., & Mørch, W. (2010). Characteristics of young children with persistent conduct problems 1 year after treatment with the Incredible Years program. *European Child & Adolescent Psychiatry, 19*(7), 559-565, https://doi.org/10.1007/s00787-009-0083-y

*Drugli, M., Larsson, B., Fossum, S., & Mørch, W. (2010). Five- to six-year outcome and its prediction for children with ODD/CD treated with parent training. *Journal of child psychology and psychiatry, and allied disciplines, 51*(5), 559-566, https://doi.org/10.1111/j.1469-7610.2009.02178.x

Dumas, J. E. (1984). Child, adult-interactional, and socioeconomic setting events as predictors of parent training outcome. *Education and Treatment of Children*, 351-363.

*Eckshtain, D., Marchette, L. K., Schleider, J., Evans, S., & Weisz, J. R. (2019). Parental depressive symptoms as a predictor of outcome in the treatment of child internalizing and externalizing problems. *Journal of Abnormal Child Psychology, 47*(3), 459-474, https://doi.org/10.1007/s10802-018-0446-2

Enebrink, P., Högström, J., Forster, M., & Ghaderi, A. (2012). Internet-based parent management training: a randomized controlled study. *Behaviour Research & Therapy, 50*(4), 240-249, https://doi.org/10.1016/j.brat.2012.01.006

Eyberg, S. M., Boggs, S. R., & Algina, J. (1995). Parent-child interaction therapy: a psychosocial model for the treatment of young children with conduct problem behavior and their families. *Psychopharmacology bulletin.*

Eyberg, S. M., & Robinson, E. A. (1982). Parent-child interaction training: Effects on family functioning. *Journal of Clinical Child & Adolescent Psychology*, *11*(2), 130-137.

Eyberg, S. M., Nelson, M. M., & Boggs, S. R. (2008). Evidence-based psychosocial treatments for children and adolescents with disruptive behavior. *Journal of clinical child & Adolescent psychology*, *37*(1), 215-237, https://doi.org/10.1080/15374410701820117

Forehand, R. L., & McMahon, R. J. (1981). *Helping the noncompliant child: A clinician's guide to parent training*. New York: Guilford Press.

Forgatch, M. S., & Gewirtz, A. H. (2018). The evolution of the Oregon Model of parent management training: An intervention for antisocial behavior in children and adolescents. In J. R. Weisz & A. E. Kazdin (Eds.), *Evidence-based psychotherapies for children and adolescents* (p. 85–102). The Guilford Press.

*Fossum, S., Mørch, W. T., Handegård, B. H., Drugli, M. B., & Larsson, B. O. (2008). Parent training for young Norwegian children with ODD and CD problems: Predictors and mediators of treatment outcome. *Scandinavian Journal of Psychology*, *50*(2), 173-181, https://doi.org/10.1111/j.1467-9450.2008.00700.x

Gardner, F., Connell, A., Trentacosta, C. J., Shaw, D. S., Dishion, T. J., & Wilson, M. N. (2009). Moderators of outcome in a brief family-centered intervention for preventing early problem behavior. *Journal of Consulting and Clinical Psychology, 77*(3), 543-553, https://doi.org/10.1037/a0015622

*Gardner, F., Hutchings, J., Bywater, T., & Whitaker, C. (2010). Who benefits and how does it work? Moderators and mediators of outcome in an effectiveness trial of a parenting intervention. *Journal of Clinical Child & Adolescent Psychology, 39*(4), 568-580, https://doi.org/10.1080/15374416.2010.486315.

Goodman, R. (1997). The Strengths and Difficulties Questionnaire: a research note. *Journal of Child Psychology and Psychiatry, 38*(5), 581-586, https://doi.org/10.1111/j.1469-7610.1997.tb01545.x

Greene, R., & Winkler, J. (2019). Collaborative & Proactive Solutions (CPS): A review of research findings in families, schools, and treatment facilities. *Clinical Child and Family Psychology Review, 22*(4), 549-561, https://doi.org/10.1007/s10567-019-00295-z

Greene, R. W. (1999). *The explosive child*. New York, NY: HarperCollins World.

Greene, R. W. (2011). Collaborative Problem Solving. In *Clinical handbook of assessing and treating conduct problems in youth*. New York, NY: Springer.

Greene, R. W., Ablon, J. S., & Goring, J. C. (2003). A transactional model of oppositional behavior: Underpinnings of the Collaborative Problem Solving approach. *Journal of Psychosomatic Research, 55*(1), 67-75, https://doi.org/10.1016/s0022-3999(02)00585-8

Gross, D., Fogg, L., & Tucker, S. (1995). The efficacy of parent training for promoting positive parent—toddler relationships. *Research in nursing & health*, *18*(6), 489-499, https://doi.org/10.1002/nur.4770180605

Hartman, R. R., Stage, S. A., & Webster-Stratton, C. (2003). A growth curve analysis of parent training outcomes: Examining the influence of child risk factors (inattention, impulsivity, and hyperactivity problems), parental and family risk factors. *Journal of Child Psychology and Psychiatry*, *44*(3), 388-398, https://doi.org/10.1111/1469-7610.00129

Higgins, J. P. T., Savović, J., Page, M. J., & Sterne, J. A. C. (2016). Revised Cochrane risk of bias tool for randomized trials (RoB 2.0). *Bristol: University of Bristol*.

Hoath, F. E., & Sanders, M. R. (2002). A feasibility study of Enhanced Group Triple P—positive parenting program for parents of children with attention-deficit/hyperactivity disorder. *Behaviour Change, 19*(4), 191-206, https://doi.org/10.1375/bech.19.4.191

*Högström, J., Enebrink, P., Melin, B., & Ghaderi, A. (2014). Eighteen-month follow-up of internet-based parent management training for children with conduct problems and the relation of homework compliance to outcome. *Child Psychiatry & Human Development*, *46*(4), 577-588, https://doi.org/10.1007/s10578-014-0498-7

Hood, K. K., & Eyberg, S. M. (2003). Outcomes of parent-child interaction therapy: Mothers' reports of maintenance three to six years after treatment. *Journal of Clinical Child and Adolescent Psychology*, *32*(3), 419-429, https://doi.org/10.1207/S15374424JCCP3203_10

Jerrell, J. M., McIntyre, R. S., & Park, Y.-M. M. (2015). Risk factors for incident major depressive disorder in children and adolescents with attention-deficit/hyperactivity disorder. *European Child & Adolescent Psychiatry, 24*(1), 65-73, https://doi.org/10.1007/s00787-014-0541-z

Jones, D., Forehand, R., Cuellar, J., Parent, J., Honeycutt, A., Khavjou, O., . . . Newey, G. (2014). Technology-enhanced program for child disruptive behavior disorders: development and pilot randomized control trial. *Journal of Clinical Child and Adolescent Psychology, 43*(1), 88-101, https://doi.org/10.1080/15374416.2013.822308

Kaehler, L. A., Jacobs, M., & Jones, D. J. (2016). Distilling common history and practice elements to inform dissemination: Hanf-model BPT programs as an example. *Clinical Child and Family Psychology Review, 19*(3), 236-258, https://doi.org/10.1007/s10567-016-0210-5.

Kaminski, J. W., Valle, L. A., Filene, J. H., & Boyle, C. L. (2008). A meta-analytic review of components associated with parent training program effectiveness. *Journal of abnormal child psychology*, *36*(4), 567-589. https://doi.org/10.1007/s10802-007-9201-9

Kazdin, A.E. (1990), Premature Termination from Treatment among Children Referred for Antisocial Behavior. Journal of Child Psychology and Psychiatry, 31: 415-425, https://doi.org/10.1111/j.1469-7610.1990.tb01578.x

Kazdin, A. E., & Wassell, G. (2000). Predictors of barriers to treatment and therapeutic change in outpatient therapy for antisocial children and their families. *Mental health services research*, *2*(1), 27-40, https://doi.org/10.1023/A:1010191807861

Kim-Cohen, J., Caspi, A., Moffitt, T. E., Harrington, H., Milne, B. J., & Poulton, R. (2003). Prior juvenile diagnoses in adults with mental disorder: developmental follow-back of a prospective-longitudinal cohort. *Archives of general psychiatry*, *60*(7), 709-717, https://doi.org/10.1001/archpsyc.60.7.709

*Kjøbli, J., Nærde, A., Bjørnebekk, G., & Askeland, E. (2014). Maternal mental distress influences child outcomes in brief parent training. *Child and Adolescent Mental Health, 19*(3), 171-177, https://doi.org/doi:10.1111/camh.12028

*Kling, Å., Forster, M., Sundell, K., & Melin, L. (2010). A randomized controlled effectiveness trial of parent management training with varying degrees of therapist support. *Behavior Therapy, 41*(4), 530-542, https://doi.org/10.1016/j.beth.2010.02.004

Kraemer, H. C., Wilson, G. T., Fairburn, C. G., & Agras, W. S. (2002). Mediators and moderators of treatment effects in randomized clinical trials. *Archives of General Psychiatry, 59*(10), 877-883, https://doi.org/10.1001/archpsyc.59.10.877

Laible, D., & Song, J. (2006). Constructing emotional and relational understanding: The role of affect and mother-child discourse. *Merrill-Palmer Quarterly (1982-), 52*(1), 44-69, https://doi.org/10.1353/mpq.2006.0006

Larsson, B., Fossum, S., Clifford, G., Drugli, M. B., Handegård, B. H., & Mørch, W.-T. (2009). Treatment of oppositional defiant and conduct problems in young Norwegian children: Results of a randomized controlled trial. *European Child & Adolescent Psychiatry, 18*(1), 42-52, https://doi.org/10.1007/s00787-008-0702-z

*Lavigne, J., Lebailly, S., Gouze, K., Cicchetti, C., Jessup, B., Arend, R., . . . Binns, H. (2008). Predictor and moderator effects in the treatment of oppositional defiant disorder in pediatric primary care. *Journal of Pediatric Psychology, 33*(5), 462-472, https://doi.org/10.1093/jpepsy/jsm075

Lavigne, J., Lebailly, S., Gouze, K., Cicchetti, C., Pochyly, J., Arend, R., . . . Binns, H. (2007). Treating oppositional defiant disorder in primary care: a comparison of three models. *Journal of Pediatric Psychology, 33*(5), 449-461, https://doi.org/10.1093/jpepsy/jsm074

Leijten, P., Raaijmakers, M. A., de Castro, B. O., & Matthys, W. (2013). Does socioeconomic status matter? A meta-analysis on parent training effectiveness for disruptive child behavior. *Journal of Clinical Child & Adolescent Psychology, 42*(3), 384-392, https://doi.org/10.1080/15374416.2013.769169

*Leijten, P., Raaijmakers, M. A. J., Orobio de Castro, B., van den Ban, E., & Matthys, W. (2017). Effectiveness of the Incredible Years Parenting Program for families with socioeconomically disadvantaged and ethnic minority backgrounds. *Journal of Clinical Child & Adolescent Psychology, 46*(1), 59-73, https://doi.org/10.1080/15374416.2015.1038823

Loerinc, A. G., Meuret, A. E., Twohig, M. P., Rosenfield, D., Bluett, E. J., & Craske, M. G. (2015). Response rates for CBT for anxiety disorders: Need for standardized criteria. *Clinical Psychology Review, 42*, 72-82, https://doi.org/10.1016/j.cpr.2015.08.004

Lundahl, B., Risser, H. J., & Lovejoy, M. C. (2006). A meta-analysis of parent training: Moderators and follow-up effects. *Clinical Psychology Review, 26*(1), 86-104, https://doi.org/10.1016/j.cpr.2005.07.004

Lundahl, B. W., Tollefson, D., Risser, H., & Lovejoy, M. C. (2008). A meta-analysis of father involvement in parent training. *Research on Social Work Practice*, *18*(2), 97-106, https://doi.org/10.1177/1049731507309828

MacKinnon, D. P., Lockhart, G., Baraldi, A. N., & Gelfand, L. A. (2013). 15 Evaluating treatment mediators and moderators. *The Oxford handbook of research strategies for clinical psychology*, 262.

McMahon, R., & Forehand, R. (2003). *Helping the noncompliant child*. New York, NY: The Guildford Press.

McTaggart, P., & Sanders, M. (2007). Mediators and moderators of change in dysfunctional parenting in a school-based universal application of the Triple-P Positive Parenting Programme. *Journal of Children's Services, 2*(1), 4-17, https://doi.org/10.1108/17466660200700002

Menting, A. T., de Castro, B. O., & Matthys, W. (2013). Effectiveness of the Incredible Years parent training to modify disruptive and prosocial child behavior: A meta-analytic review. *Clinical Psychology Review, 33*(8), 901-913, https://doi.org/10.1016/j.cpr.2013.07.006

Merikangas, K. R., Nakamura, E. F., & Kessler, R. C. (2009). Epidemiology of mental disorders in children and

    adolescents. *Dialogues in clinical neuroscience, 11*(1), 7-20.

Michelson, D., Davenport, C., Dretzke, J., Barlow, J., & Day, C. (2013). Do evidence-based interventions work

    when tested in the "real world?" A systematic review and meta-analysis of parent management training

    for the treatment of child disruptive behavior. *Clinical Child and Family Psychology Review, 16*(1), 18-

    34, https://doi.org/10.1007/s10567-013-0128-0

*Miller-Slough, R. L., Dunsmore, J. C., Ollendick, T. H., & Greene, R. W. (2016). Parent–child synchrony in

    children with oppositional defiant disorder: Associations with treatment outcomes. *Journal of Child

    and Family Studies, 25*(6), 1880-1888, https://doi.org/10.1007/s10826-015-0356-7

Moffitt, T. E., & Caspi, A. (2001). Childhood predictors differentiate life-course persistent and adolescence-

    limited antisocial pathways among males and females. *Development and psychopathology*, *13*(2), 355-

    375, https://doi.org/10.1017/s0954579401002097

Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & Group, P. (2009). Preferred reporting items for systematic

    reviews and meta-analyses: the PRISMA statement. *PLoS Medicine, 6*(7), e1000097,

    https://doi.org/10.1371/journal.pmed.1000097

Moher, D., Shamseer, L., Clarke, M., Ghersi, D., Liberati, A., Petticrew, M., . . . Group, P.-P. (2015). Preferred

    reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement.

    *Systemtic Reviews, 4*, 1, https://doi.org/10.1186/2046-4053-4-1

Murrihy, R. C., Kidman, A. D., & Ollendick, T. H. (2010). *Clinical handbook of assessing and treating conduct

    problems in youth*. New York, NY: Springer Science & Business Media.

Nock, M. K., & Ferriter, C. (2005). Parent management of attendance and adherence in child and adolescent

    therapy: A conceptual and empirical review. *Clinical Child and Family Psychology Review, 8*(2), 149-

    166, https://doi.org/10.1007/s10567-005-4753-0

*Ollendick, T. H., Greene, R. W., Austin, K. E., Fraire, M. G., Halldorsdottir, T., Allen, K. B., . . . Wolff, J. C.

    (2016). Parent Management Training and Collaborative & Proactive Solutions: A randomized control

    trial for oppositional youth. *Journal of Clinical Child and Adolescent Psychology, 45*(5), 591-604,

    https://doi.org/10.1080/15374416.2015.1004681

Ollendick, T. H., Jarrett, M. A., Grills-Taquechel, A. E., Hovey, L. D., & Wolff, J. C. (2008). Comorbidity as a

    predictor and moderator of treatment outcome in youth with anxiety, affective, attention

deficit/hyperactivity disorder, and oppositional/conduct disorders. *Clinical Psychology Review*, *28*(8), 1447-1471, https://doi.org/10.1016/j.cpr.2008.09.003

Ollendick, T. H., White, S. W., & White, B. A. (Eds.). (2018). *The Oxford handbook of clinical child and adolescent psychology*. Oxford Library of Psychology.

*Parent, J., Forehand, R. L., Merchant, M. J., Long, N., & Jones, D. J. (2011). Predictors of outcome of a parenting group curriculum: A pilot study. *Behavior Modification, 35*(4), 370-388, https://doi.org/10.1177/0145445511405185

Patterson, G. R., Reid, J. B., Jones, R. R., & Conger, R. E. . (1975). *A social learning approach to family intervention: Families with aggressive children* (Vol. 1). Eugene, OR: Castalia Publishing Co.

Prins, P., Ollendick, T. H., Maric, M., & MacKinnon, D. P. (2015). Moderators and mediators in treatment outcome studies of childhood disorders: the what, why, and how. *Moderators and mediators of youth treatment outcomes*, 1-19, https://doi.org/10.1093/med:psych/9780199360345.001.0001

Reyno, S. M., & McGrath, P. J. (2006). Predictors of parent training efficacy for child externalizing behavior problems–a meta-analytic review. *Journal of Child Psychology and Psychiatry, 47*(1), 99-111, https://doi.org/doi:10.1111/j.1469-7610.2005.01544.x

Robinson, E. A., Eyberg, S. M., & Ross, A. W. (1980). The standardization of an inventory of child conduct problem behaviors. *Journal of Clinical Child & Adolescent Psychology, 9*(1), 22-28, https://doi.org/10.1080/15374418009532938

Rutter, M. (1979). Protective factors in children's responses to stress and disadvantage. *Annals of the Academy of Medicine, Singapore, 8*(3), 324.

Sanders, M. R. (1999). Triple P-Positive Parenting Program: Towards an empirically validated multilevel parenting and family support strategy for the prevention of behavior and emotional problems in children. *Clinical Child and Family Psychology Review, 2*(2), 71-90, https://doi.org/10.1023/a:1021843613840

Sanders, M. R., Dittman, C. K., Farruggia, S. P., & Keown, L. J. (2014). A comparison of online versus workbook delivery of a self-help positive parenting program. *The Journal of Primary Prevention, 35*(3), 125-133, https://doi.org/10.1007/s10935-014-0339-2

Sawrikar, V., Hawes, D. J., Moul, C., & Dadds, M. R. (2018). The role of parental attributions in predicting parenting intervention outcomes in the treatment of child conduct problems. *Behaviour research and therapy*, *111*, 64-71, https://doi.org/10.1016/j.brat.2018.10.004

Schuhmann, E. M., Foote, R. C., Eyberg, S. M., Boggs, S. R., & Algina, J. (1998). Efficacy of parent-child interaction therapy: Interim report of a randomized trial with short-term maintenance. *Journal of clinical child psychology*, *27*(1), 34-45, https://doi.org/10.1207/s15374424jccp2701_4

Scott, S. (2001). Deciding whether interventions for antisocial behaviour work: Principles of outcome assessment, and practice in a multicentre trial. *European Child & Adolescent Psychiatry*, *10*(1), S59-S70. http://dx.doi.org/10.1007/s007870170007.

*Scott, S. (2005). Do parenting programmes for severe child antisocial behaviour work over the longer term, and for whom? One year follow-up of a multi-centre controlled trial. *Behavioural and Cognitive Psychotherapy, 33*(4), 403-421, https://doi.org/10.1017/S135246580500233X

Scott, S., Spender, Q., Doolan, M., Jacobs, B. and Aspland, H. (2001). Multicentre controlled trial of parenting groups for child antisocial behaviour in clinical practice. *British Medical Journal, 323*(7306), 194–197, https://doi.org/10.1136/bmj.323.7306.194

*Seabra-Santos, M. J., Gaspar, M. F., Azevedo, A. F., Homem, T. C., Guerra, J., Martins, V., . . . Moura-Ramos, M. (2016). Incredible Years parent training: What changes, for whom, how, for how long? *Journal of Applied Developmental Psychology, 44*, 93-104, https://doi.org/10.1016/j.appdev.2016.04.004

Shaffer, D., Fisher, P., Lucas, C. P., Dulcan, M. K., & Schwab-Stone, M. E. (2000). NIMH Diagnostic Interview Schedule for Children Version IV (NIMH DISC-IV): description, differences from previous versions, and reliability of some common diagnoses. *Journal of the American Academy of Child & Adolescent Psychiatry, 39*(1), 28-38, https://doi.org/10.1097/00004583-200001000-00014

Shaw, D. S., Dishion, T. J., Supplee, L., Gardner, F., & Arnds, K. (2006). Randomized trial of a family-centered approach to the prevention of early conduct problems: 2-year effects of the family check-up in early childhood. *Journal of Consulting & Clinical Psychology, 74*(1), 1-9, https://doi.org/10.1037/0022-006X.74.1.1

Shelleby, E. C., & Shaw, D. S. (2014). Outcomes of parenting interventions for child conduct problems: A review of differential effectiveness. *Child Psychiatry & Human Development, 45*(5), 628-645, https://doi.org/10.1007/s10578-013-0431-5

Silverman, W. K., & Albano, A. M. (1996). *Anxiety disorders interview schedule for DSM-IV: Child version*. New York, NY: Oxford University Press Inc.

*Stattin, H., Enebrink, P., Ozdemir, M., & Giannotta, F. (2015). A national evaluation of parenting programs in Sweden: The short-term effects using an RCT effectiveness design. *Journal of Consulting & Clinical Psychology, 83*(6), 1069-1084, https://doi.org/10.1037/a0039328

Steketee, G., & Chambless, D. L. (1992). Methodological issues in prediction of treatment outcome. *Clinical Psychology Review, 12*(4), 387-400, https://doi.org/10.1016/0272-7358(92)90123-P

Stringaris, A., Lewis, G., & Maughan, B. (2014). Developmental pathways from childhood conduct problems to early adult depression: findings from the ALSPAC cohort. *The British Journal of Psychiatry, 205*(1), 17-23, https://doi.org/10.1192/bjp.bp.113.134221

Tanner-Smith, E. E., Wilson, S. J., & Lipsey, M. W. (2013). Risk factors and crime. *The Oxford handbook of criminological theory*, 89-111, https://doi.org/10.1093/oxfordhb/9780199747238.013.0005

Tein, J. Y., Sandler, I. N., MacKinnon, D. P., & Wolchik, S. A. (2004). How did it work? Who did it work for? Mediation in the context of a moderated prevention effect for children of divorce. *Journal of consulting and clinical psychology*, 72(4), 617, https://doi.org/10.1037/0022-006X.72.4.617

Tucker, S., Gross, D., Fogg, L., Delaney, K., & Lapporte, R. (1998). The long-term efficacy of a behavioral parent training intervention for families with 2-year-olds. *Research in Nursing & Health, 21*(3), 199-210, https://doi.org/10.1002/(sici)1098-240x(199806)21:3<199::aid-nur3>3.0.co;2-c

Tully, L. A., Piotrowska, P. J., Collins, D. A., Mairet, K. S., Black, N., Kimonis, E. R., ... & Anderson, V. (2017). Optimising child outcomes from parenting interventions: fathers' experiences, preferences and barriers to participation. *BMC Public Health*, 17(1), 550, https://doi.org/10.1186/s12889-017-4426-1

Van Zeijl, J., Mesman, J., Van Ijzendoorn, M. H., Bakermans-Kranenburg, M. J., Juffer, F., Stolk, M. N., . . . Alink, L. R. A. (2006). Attachment-based intervention for enhancing sensitive discipline in mothers of 1- to 3-year-old children at risk for externalizing behavior problems: A randomized controlled trial. *Journal of Consulting and Clinical Psychology, 74*(6), 994-1005, https://doi.org/10.1037/0022-006X.74.6.994

Webster-Stratton, C. (1981). Modification of mothers' behaviors and attitudes through videotape modeling group discussion program. *Behavior Therapy, 12*, 634 – 642, https://doi.org/10.1016/S0005-7894(81)80135–9

Webster-Stratton, C. (1982a). The long-term effects of a videotape modeling parent-training program: Comparison of immediate and one-year follow-up results. *Behavior Therapy, 13*, 702-704, https://doi.org/10.1016/S0005-7894(82)80026-9

Webster-Stratton, C. (1982b). Teaching mothers through videotape modeling to change their children's behavior. *Journal of Pediatric Psychology*, *7*(3), 279-294, https://doi.org/10.1093/jpepsy/7.3.279

Webster-Stratton, C. (1984). Randomized trial of two parent-training programs for families with conduct-disordered children. *Journal of Consulting and Clinical Psychology, 52*(4), 666-678, https://doi.org/10.1037/0022-006x.52.4.666

Webster-Stratton, C. (1990). Long-term follow-up of families with young conduct problem children: From preschool to grade school. *Journal of clinical child psychology, 19*(2), 144-149, https://doi.org/10.1207/s15374424jccp1902_6

Webster-Stratton, C. (1992). Individually administered videotape parent training: "who benefits?". *Cognitive Therapy and Research, 16*(1), 31-52, https://doi.org/10.1007/BF01172955

Webster-Stratton, C. (1998). Preventing conduct problems in Head Start children: Strengthening parenting competencies. *Journal of consulting and clinical psychology*, *66*(5), 715, https://doi.org/10.1037//0022-006x.66.5.715

Webster-Stratton, C. (1994). Advancing videotape parent training: A comparison study. *Journal of Consulting and Clinical Psychology, 62*(3), 583-593, https://doi.org/10.1037/0022-006x.62.3.583

Webster-Stratton, C. (2008). *Preschool BASIC parent training program.* Seattle, WA: Incredible Years

Webster-Stratton, C., Gaspar, M. F., & Seabra-Santos, M. J. (2012). Incredible Years® parent, teachers and children's series: Transportability to Portugal of early intervention programs for preventing conduct problems and promoting social and emotional competence. *Psychosocial Intervention, 21*(2), 157-169, https://doi.org/10.5093/in2012a15

Webster-Stratton, C., & Hammond, M. (1997). Treating children with early-onset conduct problems: A comparison of child and parent training interventions. *Journal of Consulting and Clinical Psychology, 65*(1), 93-109, https://doi.org/10.1037/0022-006X.65.1.93

Webster-Stratton, C., Hollinsworth, T., & Kolpacoff, M. (1989). The long-term effectiveness and clinical significance of three cost-effective training programs for families with conduct-problem children. *Journal of Consulting and Clinical Psychology, 57*, 550–553, https://doi.org/10.1207/S15374424JCCP3301_11

Webster-Stratton, C., & Reid, M. J. (1999, November). Treating children with early-onset conduct problems: The importance of teacher training. Paper presented at the annual meeting of the Association for the Advancement of Behavior Therapy, Toronto, Ontario, Canada.

Webster-Stratton, C., & Reid, M. J. (2003). The Incredible Years parents, teachers and children training series: a multifaceted treatment approach for young children with conduct problems. In *Evidence-based psychotherapies for children and adolescents*. New York, NY: The Guildford Press.

*Weeland, J., Chhangur, R. R., van der Giessen, D., Matthys, W., de Castro, B. O., & Overbeek, G. (2017). Intervention Effectiveness of The Incredible Years: New Insights Into Sociodemographic and Intervention-Based Moderators. *Behavior Therapy, 48*(1), 1-18, https://doi.org/j.beth.2016.08.002

Weisz, J. R., Chorpita, B. F., Palinkas, L. A., Schoenwald, S. K., Miranda, J., Bearman, S. K., . . . Gibbons, R. D. (2012). Testing standard and modular designs for psychotherapy treating depression, anxiety, and conduct problems in youth: A randomized effectiveness trial. *Archives of General Psychiatry, 69*(3), 274-282, https://doi.org/10.1001/archgenpsychiatry.2011.147

Weisz, J. R., Sandler, I. N., Durlak, J. A., & Anton, B. S. (2005). Promoting and protecting youth mental health through evidence-based prevention and treatment. *American psychologist*, *60*(6), 628.Werba, B. E., Eyberg, S. M., Boggs, S. R., & Algina, J. (2006). Predicting outcome in parent-child interaction therapy: Success and attrition. *Behavior Modification, 30*(5), 618-646, https://doi.org/10.1177/0145445504272977

*Werba, B. E., Eyberg, S. M., Boggs, S. R., & Algina, J. (2006). Predicting outcome in parent-child interaction therapy: Success and attrition. *Behavior Modification*, 30(5), 618-646, https://doi.org/10.1177/0145445504272977

Wilson, D. B., & Lipsey, M. W. (2001). The role of method in treatment effectiveness research: Evidence from meta-analysis. *Psychological methods*, *6*(4), 413, https://doi.org/10.1037//1082-989X.6.4.413

*Zachary, C., Jones, D. J., McKee, L. G., Baucom, D. H., & Forehand, R. L. (2017). The role of emotion regulation and socialization in behavioral parent training: A proof-of-concept study. *Behavior Modification*, 0145445517735492, https://doi.org/10.1177/0145445517735492

* = study included in analysis

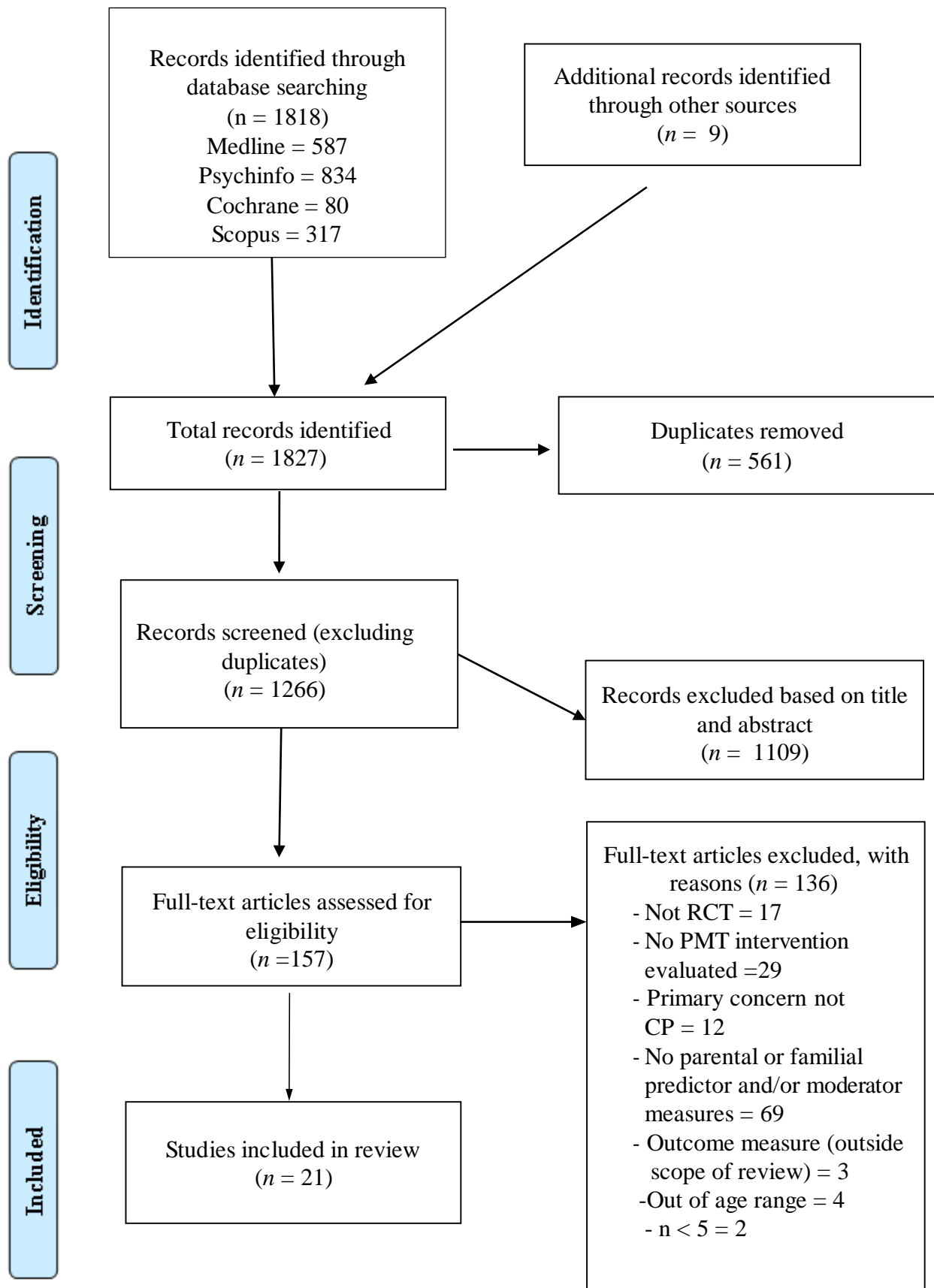*Figure 1*. Overall flow chart of articles screened.

Table 1. *Study Characteristics.*

| Study | Age, Gender and Ethnicity | Intervention, format and N | Measures | Criteria required for inclusion | Follow-up Length |
|---|---|---|---|---|---|
| *Incredible Years (IY; Webster-Stratton, 1981; 1982; 2008)* | | | | | |
| Scott (2005)<br><br>Sample from Scott et al. (2001)<br><br>(UK) | Age range:<br>3-8yrs. (M=7, SD 1.66).<br>71% male<br><br>Ethnicity:<br>10% ethnic minority, specific not reported. | Group.<br>N=59 | Demographic information; PACS; SDQ; PDPQ; BDI. | Referred for antisocial behaviour. | 1yr |
| Beauchaine et al. (2005)<br><br>Combined sample from 6 RCTs by Webster-Stratton (1982, 1984, 1994), Webster-Stratton & Hammond (1997), Webster-Stratton et al. (1989) and Webster-Stratton et al. (1999).<br><br>(USA) | Age range: 3-8.5yrs. (M=5.4, SD=1.3).<br>78% male<br><br>Ethnicity:<br>4.8% African American, 88.5% Caucasian, 3.9% Latino, 2.8% other. | Group.<br>N=514<br>PT=317<br>CT=60<br>PT+ CT=38<br>PT + TT=24<br>CT + TT=23<br>PT+CT+TT= 25<br>WLC=27. | CBCL; DDI; PSI; ECBI; DPICS-R; DAS; BDI; PSAAQ; Hollingshead two factor index. | Diagnosis of ODD and/or CD according to DSM-III-R or DSM-IV. Clinically significant levels on the ECBI. | 1yr |
| Fossum et al. (2008)<br><br>Sample from Larsson et al. (2009)<br><br>(Norway) | Age range:<br>4-8yrs. (M=6.6, SD=1.3). Boys: PT 80.9%, PT + CT 78.8 %, WLC 78.6%<br><br>Ethnicity:<br>98% native- speaking Norwegians, other 2% ethnicity not reported. | Group.<br>N=127<br>PT=47<br>PT+C=52<br>WLC=28. | ECBI; DPICS-R; PBQ-TRF; KSADS; PSI; BDI. | Diagnosis of ODD and/or CD according to DSM-IV. Clinically significant levels on the ECBI. | None |

Table 1. Continued.

| Study | Age, Gender and Ethnicity | Intervention, format and N | Measures | Criteria required for inclusion | Follow-up Length |
|---|---|---|---|---|---|
| Lavigne et al. (2008)<br><br>Sample from Lavigne et al. (2007)<br><br>(USA) | Age range:<br>3-6yrs. (M=4.6, SD=1.0).<br>53% male<br><br>Ethnicity:<br>75% White, 25% not white. | Group.<br>N=117<br>Nurse-led=49,<br>Psychologist-led=37,<br>Minimal Intervention =31. | Family Background Questionnaire; BDI; RABI; ECBI; CBCL; Videotaped Parent-child Interaction; PSI-SF; C-GAS. | Met diagnostic criteria DSM-IV for ODD based on clinical consensus diagnoses. | 12 months |
| Gardner et al. (2010)<br><br>(UK) | Age range:<br>36-59 months. IY:(M=46.4, SD=6.6);<br>WLC: (M=46.2, SD=4.2).<br><br>Gender: IY: 57% male; WLC: 66% male<br><br>Ethnicity:<br>Not specified. | Group.<br>Total N=133<br>IY=86<br>WLC=47. | PDHQ; ECBI Problem Scale score; BDI. | At risk of developing CD-scored above clinical cut off on the ECBI problem or intensity scale. | 6 months |
| Drugli, Fossum et al. (2010)<br><br>Sample from Larsson et al. (2009)<br><br>(Norway) | Age range:<br>4-8yrs. (M=6.6, SD=1.3).<br>80% male<br><br>Ethnicity:<br>Not specified. | Group.<br>Total N=99<br>PT= 47<br>CT+PT = 52. | Parent interview; Demographics; ECBI; CBCL; Kiddie-SADS; PPI; PBI-TRF; PSI. | Sub-threshold or diagnosis of ODD and/or CD determined by Kiddie-SADs. | 1yr |
| Drugli, Larsson et al. (2010)<br><br>Sample from Larsson et al. (2009)<br><br>(Norway) | Age range:<br>4-8 yrs.<br>(M=12.1, SD=1.3).<br>83% male<br><br>Ethnicity:<br>Not specified. | Group.<br>Total N=54<br>PT=20<br>PT+CT=34. | Demographics; Kiddie-SADS, ECBI, CBCL; PPI, BDI, PSI. | Sub-threshold or diagnosis of ODD and/or CD determined by Kiddie-SADs. | 5-6yrs |

Table 1. Continued.

| Study | Age, Gender and Ethnicity | Intervention, format and N | Measures | Criteria required for inclusion | Follow-up Length |
|---|---|---|---|---|---|
| Seabra-Santos et al. (2016)<br><br>(Portugal) | Age range:<br>3-6yrs. (M=55.86 months, SD=11.20).<br>73% male<br><br>Ethnicity:<br>Portuguese. | Group.<br>Total N=124<br>IY=68<br>WLC=56. | Demographics; SDQ; PKBS-2; BDI. | A score above 80th percentile on the SDQ to determine if at risk for disruptive behaviours. | 12 and 18 months |
| Weeland et al. (2017)<br><br>(Netherlands) | Age range:<br>4-8yrs.<br>(M=6.21, SD=1.33).<br>30% male<br><br>Ethnicity:<br>97.4% born in The Netherlands, other 2.6% specifics not reported. | Group.<br>Total N=387<br>IY=197<br>Control=190. | Demographics; PPI; ECBI; DPICS. | A score at or above the 75th percentile on ECBI. | 4 months |
| Leijten et al. (2017)<br><br>(Netherlands) | Age range:<br>3-8 yrs. (M=5.6, SD=1.35).<br>62% male<br><br>Ethnicity:<br>Recruited (n=110)<br>26% Caucasian, 39% Moroccan, 18% Turkish, 17% other.<br>Referred (n=46) 84% Caucasian, 11% Moroccan, 5% other. | Group.<br>N=154<br>IY=107<br>WLC=47. | ECBI; PPI; PSI-SF; SDQ; K-DBDS; DISC-IV; Parent Rating of Aggression instrument. | Recruited: Identified parenting difficulties due to disruptive child behaviour.<br><br>Referred: Diagnosis of ODD, CD, ADHD or parent–child relational problems. | 3 months |
| *Defiant Child (DC: Barkley, 2013)* | | | | | |
| Ollendick et al. (2016)<br><br>(USA) | Age range:<br>7-14yrs. (M=9.52, SD=1.80).<br>Gender:<br>CPS 67% male,<br>DC 57% male, WLC 64% male | Individual.<br>Total N=134<br>CPS=60<br>DC=63<br>WLC=11. | Demographic form; ADIS-C/P; CGI-S; CGI-I; DBDRS; BASC-2. | Diagnosis of ODD based on the ADIS-C/P. | 6 months |

Table 1. Continued.

| Study | Age, Gender and Ethnicity | Intervention, format and N | Measures | Criteria required for inclusion | Follow-up Length |
|---|---|---|---|---|---|
| Ollendick et al. cont. | Ethnicity: 84% Caucasian, 16% non-Caucasian. | | | | |
| Miller-Slough et al. (2016) <br><br> Sample from Ollendick et al. (2016) <br><br> (USA) | Age range: 7-12yrs. (M=9.66, SD=1.75) 61% male <br><br> Ethnicity: 88.45 % Caucasian, 4.75 % African American, 4.3 % Asian American, 2.65 % Hispanic/ Latino, 0.25 % Native American, 1.8 % Biracial. | Individual. Total N=75 (ie DC+CPS) – specific group n's not specified. | ADIS-C/P; Emotion Talk Task; BASC-2. | Diagnosis of ODD according to diagnostic criteria. | None |
| Eckshtain et al. (2019) <br><br> Sample from Weisz et al. (2012) <br><br> (USA) | *Age range: 7-13yrs (M=10.11, SD=1.69) Gender: 67.6% male <br><br> Ethnicity: 46.5% White/Caucasian, 9.9% African, American/Black, 5.6% Hispanic/Latino, 1.4% Asian, 32.4% multi-racial, 4.2% other. | Individual. DC= 63. | CBCL; YSR; BPC; BSI. | DSM–IV diagnosis or clinically elevated problem levels in the areas of anxiety, depression, and/or disruptive conduct. | None |
| *Communication Method (COMET: Kling, Forster, Sundell & Melin, 2010).* | | | | | |
| Kling et al. (2010) <br><br> (Sweden) | Age range: 3-10 yrs. (M=6, SD=2.3) 60% male | Group. Total N=148 PMT-nurse group=56 PMT-self led=52 WLC=40. | Demographic questionnaire and composite score of: PDR, ECBI-IS, ECBI-PS; PPI. | A score above the 90th percentile on the impact and burden scale from SDQ. | 6 months |

Table 1. Continued.

| Study | Age, Gender and Ethnicity | Intervention, format and N | Measures | Criteria required for inclusion | Follow-up Length |
|---|---|---|---|---|---|
| Kling et al. cont. | Ethnicity: 78% born in Sweden, 22% immigrants. | | | | |
| Högström et al. (2014) Sample from Enebrink et al. (2012) (Sweden) | Age range: 3-11 yrs. (M= 6.71, SD = 2.31) 53.4% male<br><br>Ethnicity: 98.3 % born in Sweden, remaining % NR. | Group. Total N=104 iCOMET=58 WLC=46. | ECBI; PPI; SDQ; Homework Assignments: Total number of homework tasks completed;<br><br>Prompting positive behaviour: Responsive playtime; prepare and prompt; tasks and rewards.<br><br>Homework intended to reduce negative behaviors: Ignoring misbehaviour; time out. | One SD above the mean on the ECBI in relation to the age of the child. | 18 months |
| Stattin at al. (2015) (Sweden) | Age range: 3-12 yrs. Mean (SD): Connect 7.32 (2.41), Cope 7.07 (2.54), IYP 6.93 (2.15), Connect 9.8 (1.35), WLC 6.71 (2.35) Male: Comet 64.90% Cope 61.10% IYP 67.10% Connect 60.40% WLC 60.40%.<br><br>Ethnicity: 89% born in Scandinavian countries. | Group. Total N=908 COMET=207 IYP=122 Cope =202 Connect=218 WLC=159. | Demographics questionnaire; ECBI; SNAP-IV (ODD subscale). | All children seeking usual services, without an autism spectrum disorder diagnosis. | None |

Table 1. Continued.

| Study | Age, Gender and Ethnicity | Intervention, format and N | Measures | Criteria required for inclusion | Follow-up Length |
|---|---|---|---|---|---|
| *Parent Child Interaction Therapy (PCIT; Eyberg, & Robinson, 1982)* | | | | | |
| Werba et al. (2006) (USA) | Age Range: 3-6 yrs. (M=58.1mth, SD=13). 80% male  Ethnicity: 78% White, 14% Black, 8% Hispanic/Asian/biracial. | Individual. Total N=99 WLC=47 PCIT=52. | Treatment success was defined as meeting highly specific treatment completion criteria for PCIT. ECBI; PSI; BDI, PPVT-R, WPT, DAS, PLOC, DPICS-II and demographic information, Hollingshead's four-factor index, Maternal distress = composite of BDI and PSI. | ODD diagnosis determined by DSM-III-R Structured Interview. | None |
| *Helping the Non- compliant Child (HNC; Forehand & McMahon,1981; McMahon & Forehand, 2003)* | | | | | |
| Parent et al. (2011) (USA) | Age range: 3-6yrs. (M= 4.50, SD= NR). 51% Male  Ethnicity: 92.3% European American, 7.7% other. | Group. N=39 GC=NR WLC=NR. | ECBI; BSI; PCS (conflict subscale); demographics. | Parents expressed an interest in improving their child's behaviour. | 2 months |
| Zachary et al. (2017)  Secondary analysis of data from Jones et al. (2014)  (USA) | Age range: 3-8 yrs. (M=5.69, SD=1.58) 47% male  Ethnicity: 16% Hispanic/Latino, 31% African-American, 47% Caucasian, 6% other. | Individual. N=22. HNC=11 TE-HNC=11. | ECBI; CCNES; DERS; Efficiency of services. | Clinical range of disruptive behaviours on the ECBI. | None |

Table 1. Continued.

| Study | Age, Gender and Ethnicity | Intervention, format and N | Measures | Criteria required for inclusion | Follow-up Length |
|---|---|---|---|---|---|
| *Brief Parent Training (BPT: Askeland, Berg, Christiansen, Flock & Launes, 2006)* | | | | | |
| Kjøbli et al. (2014)<br><br>(Norway) | Age range: 3-12 yrs. (M=7.28, SD=2.61) 68.1% male Ethnicity: 93.5% Norwegian background, 1.9% other Western European Countries, 4.6% 'other'. | Individual. Total N=187 BPT=95 TAU=92. | Parent: ECBI; CBCL; HCSBS. Teacher: SSBS. Maternal mental distress: SCL-5. | Exhibit problem behaviour, based on clinical judgements at first contact. | None |
| *Triple P (Sanders, 1999)* | | | | | |
| Dittman et al. (2014)<br><br>Sample from Sanders et al. (2014)<br><br>(New Zealand) | Age range: 3-8yrs. (M=5.63, SD=1.65) 71% male<br><br>Ethnicity: 92% New Zealand European background, 4% Maori, 4% Pacific Islanders. | Individual. Total N=89 TPOL=89. | Demographics; ECBI; PS; PTC; Brief-CAP; DASS; PAI; PPC; Parent child relationship quality; Parental attributions regarding child misbehaviour. | Elevated levels of disruptive behaviour problems. | None |

*Note.* *Demographics are based on a combined sample of internalizing (n = 79) and externalizing disorders (n = 63). Results for the externalizing disorders are presented.

ADHD: Attention Deficit Hyperactivity Disorder; ADIS-C/P: Anxiety Disorders Interview Schedule for DSM–IV, Child and Parent Versions; BASC-2: Behaviour Assessment System for Children, Second Edition; BDI: Beck Depression Inventory; BPC: The Brief Problem Checklist; Brief-CAP: Brief version of Child Maltreatment Risk; BSI: Brief Symptom Inventory; CBCL: Child Behaviour Check List; CCNES: Coping With Children's Negative Emotions Scale; CD: Conduct Disorder; C-GAS: Children's Global Adjustment Scale; CGI-I: Clinical Global Impression–Improvement; CGI-S: Clinical Global Impression–Severity; CPS: Collaborative & Proactive Solutions; CT: Child Training; DAS: Dyadic Adjustment Scale; DASS: Depression Anxiety Stress Scales; DBDRS: Disruptive Behaviour Disorders Rating Scale; DDI: Daily Discipline Inventory; DERS: Difficulties in Emotion Regulation Scale; DISC-IV: Diagnostic Interview Schedule for Children Version IV; DPICS: Dyadic Parent–Child Interaction Coding System; DPICS-II: Dyadic Parent-Child Interaction Coding System II; DPICS-R: Dyadic Parent-Child Interaction Coding System-Revised; DSM-III-R: Diagnostic and Statistical Manual of Mental Disorders -Third Edition–Revised; DSM-IV: Diagnostic and Statistical Manual of Mental Disorders - Fourth Edition; ECBI: Eyberg Child Behaviour Inventory; ECBI-IS: Eyberg Child Behaviour Inventory - Intensity Scale; ECBI-PS: Eyberg Child Behaviour Inventory - Problem Scale; GC: Group Curriculum; HCSBS: Home and Community Social Behaviour Scales; IQ: Intelligence Quotient; K-DBDS: Kiddie-Disruptive Behaviour Disorder Schedule; K-SADS: Kiddie Schedule for Affective Disorders and Schizophrenia; NR: Not Reported; NS: Not Significant; ODD: Oppositional Defiant Disorder; PACS: Parent Account of Child Symptoms; PAI: Parental Anger Inventory; PBQ-TRF: Preschool Behaviour Questionnaire - Teacher Report Form; PCS: Parenting Convergence Scale; PDHQ: Personal Data and Health Questionnaire; PDPQ: Parent Defined Problems Questionnaire; PDR: Parent Daily Report; PKBS-2: Preschool and Kindergarten Behaviour Scales — Second Edition; PLOC: Parental Locus of Control Scale; PPC: Parent Problem Checklist; PPI: Parent Practices Interview; PPVT-R: Peabody Picture Vocabulary Test–

Revised; PS: Parenting Scale; PSAAQ: Parental Substance and Alcohol Abuse Questionnaire; PSI: Parenting Stress Index; PSI- SF: Parenting Stress Index - Short Form; PT: Parent Training; PTC: Parenting Task Index; RABI: Rochester Adaptive Behaviour Inventory; RCTs: Random-Controlled Trials; SCL-5: Symptom Check List-5; SDQ: Strengths and Difficulties Questionnaire; SES: Socio-economic Status; SNAP-IV: Swanson, Nolan, and Pelham Rating Scale; SSBS: School Social Behaviour Scales; TAU: Treatment as usual; TE-HNC: Technology-Enhanced Helping the Noncompliant Child; TRF: Teacher Report Form; TT: Teacher Training; VPCI: Videotaped Parent-Child Interaction; WLC: Wait list control; WPT: Wonderlic Personnel Test; YSR: The Youth Self-Report.

- indicates not applicable.

Table 2. *Main Findings.*

| Study | Predictors | Moderators | Main Findings | |
|---|---|---|---|---|
| | | | Predictors | Moderators |
| *Incredible Years (IY; Webster-Stratton, 1981; 1982; 2008)* | | | | |
| Scott (2005) | Mother in ethnic minority; SES; single parent; maternal depression, maternal education level, shorter pregnancy. | None. | All NS. | - |
| Beauchaine et al. (2005) | *All variables tested as moderators and predictors*<br><br>Life stress, marital adjustment and satisfaction, maternal depression, parental substance and alcohol abuse, maternal education, maternal age, maternal relationship status, social class. | See previous column. | More positive treatment responses were observed at 1 year in children of (a) younger mothers and (b) parents with substance abuse histories. | Children of mothers reporting low marital adjustment had better 1yr outcomes when the interventions included PT. *In mother-reported and behaviour observation models*: Children who (a) were below the sample median on social class, (b) had fathers with a history of substance abuse, (c) were parented by single mothers, or (d) had mothers with higher symptoms of depression, each fared best at 1 year outcome when PT or CT was included in their treatment. |
| Fossum et al. (2008) | Maternal factors: age, marital status, education, stress and depression. | None. | High levels of maternal stress predicted a worse treatment outcome in maternal reports on the ECBI for both treatment groups at post therapy. | - |
| Lavigne et al. (2008) | *All variables tested as moderators and predictors*<br><br>Demographic characteristics: parental education, minority status, marital status, SES.<br>Parent characteristics: maternal life stress, maternal depression, distress<br>Parent-child interactions: initial levels of maternal warmth, respect for autonomy, maternal structure, assistance | See previous column. | Higher levels of initial life stress, parenting distress and parent-child dysfunction, predicted greater gains following treatment at follow up.<br><br>Lower initial levels of parenting distress, life stress and parent-child dysfunction, predicted less behaviour problems following treatment at post and follow up. | All NS (Statistically significant interaction for maternal education but cells too small so results not interpreted). |

Table 2. Continued.

| Study | Predictors | Moderators | Main Findings | |
|-------|-----------|-----------|---------------|---|
| | | | Predictors | Moderators |
| Lavigne et al. cont. | synchrony/quality, or overall competence; parent–child dysfunction interaction; specific interaction variable including: use of a-commands (specifically stated maternal commands), questions, rewards, attends. | | | |
| Gardner et al. (2010) | *Single or teen parenthood, very low income, maternal depression. | None. | Children of more depressed mothers had better outcomes following intervention, relative to children in the control group who experienced poorer outcomes. | - |
| Drugli, Fossum et al. (2010) | Family processes: lone parenthood, contact with child protection service. Maternal factors: educational level, psychiatric treatment, parenting style (positive and harsh parenting), parenting stress. | None. | Having contact with child protection services (vs. no contact) was found to predict treatment nonresponse at the 1-year follow-up. | - |
| Drugli, Larsson et al. (2010) | Living with mother only, maternal depressive symptoms and maternal parenting stress. | None. | At pre-treatment, living with mother only predicted ODD/CD diagnosis at 5-6yr follow up. High levels of maternal depressive symptoms and stress at post-treatment predicted a diagnosis of ODD/CD at 5-6yr follow up. No longer significant when controlling for other variables | - |
| Seabra-Santos et al. (2016) | *Maternal depressive symptoms, SES. | None. | All NS. | - |

Table 2. Continued.

| Study | Predictors | Moderators | Main Findings | |
|---|---|---|---|---|
| | | | Predictors | Moderators |
| Weeland et al. (2017) | *SES, family composition. | None. | All NS. | - |
| Leijten et al. (2017) | *Education level, ethnic background. | None. | All NS. | - |
| *Defiant Child (DC: Barkley, 2013)* | | | | |
| Ollendick et al. (2016) | Socioeconomic status and race/ethnicity. | None. | All NS. | - |
| Miller-Slough et al. (2016) | Parent child synchrony. | None. | Parent child synchrony at pre-treatment was associated with lower emotional lability and less aggression at the end of treatment. | - |
| Eckshtain et al. (2019) | Parental depressive symptoms. | None. | NS for post treatment outcome. However, children of parents with elevated levels of depressive symptoms showed significantly faster levels of improvement during treatment. | - |
| *Communication Method (COMET: Kling, Sundell & Melin, 2010)* | | | | |
| Kling et al. (2010) | None. | Single parent homes, mother's age, father's age, immigrant parents, mothers with higher education, fathers with higher education. | - | All NS. |
| Högström et al. (2014) | Homework promoting positive behaviors; homework intended to reduce negative behaviors. | None. | Pre- to post-improvement was predicted by parents' implementation of Homework assignments intended to reduce negative behavior. | - |
| Stattin et al. (2015) | None. | Parent age, family income, economic | | All NS. |

Table 2. Continued.

| Study | Predictors | Moderators | Main Findings | |
|---|---|---|---|---|
| | | | Predictors | Moderators |
| Stattin et al. cont. | | (personal financial) strain, marital status, immigrant origin and parents' receipt of therapeutic services. | | |
| *Parent Child Interaction Therapy (PCIT; Eyberg, & Robinson, 1982)* | | | | |
| Werba et al. (2006) | Demographic characteristics: SES, maternal age, single-parent status, number of children in family. Maternal characteristics: IQ, depressive symptoms, marital adjustment, parenting stress related to parent characteristics, maternal parenting stress related to child characteristics, total maternal parenting stress, parenting locus of control, tolerance for child misbehaviour. Maternal behaviour management skills: total commands, inappropriate behaviour, prosocial behaviour, direct command ratio. | None. | For mothers: high stress and inappropriate behaviour (criticism and sarcasm observed during parent-child interactions) predicted treatment drop out and poorer treatment outcome. Younger mothers were significantly more likely to drop out of WLC and PCIT groups. | - |
| *Helping the Non- compliant Child (HNC; Forehand & McMahon,1981; McMahon & Forehand, 2003)* | | | | |
| Parent et al. (2011) | Parental depression, marital status; co-parent conflict. | None. | Higher levels of parent depressive symptoms predicted lower levels of child disruptive behavior at 2 month follow-up. | - |
| Zachary et al. (2017) | Caregiver emotion dysregulation and socialisation practices. | None. | Baseline caregiver emotion regulation predicted treatment duration and outcomes (more dysregulation was associated with poorer outcomes and longer treatment duration). | - |

Table 2. Continued.

| Study | Predictors | Moderators | Main Findings | |
|---|---|---|---|---|
| | | | Predictors | Moderators |
| Zachary et al. cont. | | | For emotion socialization, higher, rather than lower, coaching of children's emotions was moderately associated with higher (rather than lower) caregiver ratings of child behaviour as problematic at post treatment. | |
| *Brief Parent Training (BPT: Askeland, Berg, Christiansen, Flock & Launes, 2006)* | | | | |
| Kjøbli et al. (2014) | *Variable examined as moderator and predictor* maternal mental distress (anxiety and depression). | See previous column. | High maternal distress predicted poor treatment outcome for parent and teacher reported conduct problems. For the BPT group, low maternal distress predicted positive (teacher reported) outcomes and high maternal distress reported poorer (teacher reported) outcomes. | Low levels of maternal distress and high levels of parent reported conduct problems predicted better treatment outcomes for the BPT versus comparison group. |
| *Triple P (Sanders, 1999)* | | | | |
| Dittman et al. (2014) | Family processes: parental education and low SES. Parent variables: depression, ineffective discipline, parenting confidence, parent-child relationship quality, child maltreatment risk, and parental attributions regarding child misbehaviour. Father participation in the intervention*. | None. | For mothers: A more negative parent–child relationship at T1 predicted poorer child behaviour at T2. | - |

*Note.* *studies indicated moderation but are prediction analyses (Kraemer et al. 2002)
CD: Conduct Disorder; CT: Child Training; ECBI: Eyberg Child Behaviour Inventory; IQ: Intelligence Quotient; NS: Not Significant; ODD: Oppositional Defiant Disorder; PT: Parent Training; SES: Socio-economic Status; WLC: Wait list control; - indicates not applicable.

Table 3. *Risk of bias summary for included studies.*

| Authors | Randomization process | Deviations from intended interventions | Missing outcome data | Measurement of outcome | Selection of reported results | Overall bias |
|---|---|---|---|---|---|---|
| Scott (2005) | ? | + | ? | + | + | - |
| Beauchaine et al. (2005) | + | - | + | ? | + | ? |
| Fossum et al. (2008) | - | + | + | + | + | - |
| Lavigne et al. (2008) | ? | ? | + | + | + | ? |
| Gardner et al. (2010) | + | + | + | + | + | + |
| Drugli, Fossum et al. (2010) | ? | + | + | - | + | - |
| Drugli, Larsson et al. (2010) | - | + | - | + | + | - |
| Seabra-Santos et al. (2016) | + | + | + | + | + | + |
| Weeland et al. (2017) | + | + | + | + | + | + |
| Leijten et al. (2017) | + | - | + | - | + | - |
| Ollendick et al. (2016) | + | + | + | + | + | + |
| Miller-Slough et al. (2016) | + | + | + | + | + | + |
| Eckshtain et al. (2019) | + | + | + | + | + | + |
| Kling et al. (2010) | ? | + | + | + | + | ? |
| Högström et al. (2014) | + | + | + | - | + | - |
| Stattin at al. (2015) | ? | + | + | + | + | ? |
| Werba et al. (2006) | ? | + | + | - | ? | - |
| Parent et al. (2011) | ? | + | + | - | + | - |
| Zachary et al. (2017) | ? | ? | + | ? | + | ? |
| Kjøbli et al. (2014) | + | + | + | ? | ? | ? |
| Dittman et al. (2014) | ? | - | + | - | + | - |

*Note.* +: low concern; -: high concern; ?: some concern.

*Figure 2*. Risk of bias graph, summarising authors ratings of included studies on risk of bias dimensions, presented as percentages across all included studies.