Preschool children with ADHD symptoms and behavioral problems
Mulders, Lianne

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Document Version
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Publication date: 2018

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Chapter 3

Preschool children’s response to behavioral parent training and parental predictors of outcome in routine clinical care

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This chapter has been published in Clinical Psychology & Psychotherapy (2018), 25(1):1-9.
doi: 10.1002/cpp.2117

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Abstract

Objective: To investigate the effectiveness of behavioral parent training for preschool children with disruptive behaviors and to explore parental predictors of response.

Methods: Parents of 68 preschool children, aged between 2.7 and 5.9 years, participated in behavioral parent training. We evaluated the changes in children’s behavior after behavioral parent training with a one group pretest-posttest design, using a waiting period for a double pretest. Outcome was based on parents’ reports of the intensity and number of behavior problems on the Eyberg Child Behavior Inventory. Predictor variables included parents’ attention-deficit/hyperactivity disorder (ADHD) symptoms, antisocial behaviors, and alcohol use, and maternal parenting self-efficacy and disciplining.

Results: Mother-reported child behavior problems did not change in the waiting period but improved significantly after behavioral parent training ($d = 0.63$). High levels of alcohol use by fathers and low levels of maternal ineffective disciplining were each associated with somewhat worse outcome.

Conclusions: Behavioral parent training under routine care conditions clearly improves disruptive behaviors in preschool children. Mothers who consider themselves as inadequate in disciplining and mothers whose partners do not consume high levels of alcohol report the largest improvements.
Introduction

Behavioral parent training is a first-line treatment for preschool children with disruptive behaviors (Charach, Carson, Fox, Ali, Beckett & Lim, 2013; Comer, Chow, Chan, Cooper-Vince, & Wilson, 2013; LaForett, Murray, & Kollins, 2008; Mulqueen, Bartley, & Bloch, 2013) and its efficacy has been confirmed in meta-analyses (Charach et al., 2013; Comer et al., 2013; Mulqueen et al., 2013; Rimestad, Lambek, Zacher Christiansen, & Hougaard, 2016). Behavioral parent training aims to decrease disruptive behavior problems in children by enhancing parenting skills. Parents learn to manipulate antecedents of child behaviors in order to enable the child to behave adequately, and how to react to child behaviors in an effective, controlled, consistent, and consequent way (contingency management techniques).

Behavioral parent training improves not only child disruptive behaviors, including attention-deficit/hyperactivity disorder (ADHD) symptoms, but also parenting skills and sense of competence (Charach et al., 2013; Comer et al., 2013; Mulqueen et al., 2013). However, evidence until now has mostly been based on formal randomized trials, whereas little is known about behavioral parent training outcome in referred cases under routine care conditions. Only one study showed that behavioral parent training for clinically referred young children with disruptive behavior problems, including ADHD symptoms, was effective in reducing behavioral problems in a real-world outpatient mental health setting (Trillingsgaard, Trillingsgaard, & Webster-stratton, 2014).

Another issue, besides the lack of behavioral parent training studies using data from clinical practice, is the limited use of father and teacher reports as outcome measure. In the majority of studies, mothers were the only raters of outcome measures (Fabiano, 2007). Ideally, behavioral parent training for preschoolers should consider both parents’ ratings. So far, only one trial presented father-reported data of a combined parent and child training for preschool children (Webster-Stratton, Reid, & Beauchaine, 2011). Also, teacher reports of child behavior are useful in behavioral parent training trials, as teachers may be more independent informants and may reflect generalization of intervention effects.

Furthermore, there is large variability in the degree to which individual children improve through behavioral parent training (Sonuga-Barke, Daley, Thompson, Laver-Bradbury, & Weeks, 2001; Webster-Stratton et al., 2011). Various predictors of response to behavioral parent training in preschool children with disruptive behavior problems have been investigated, mostly child factors, such as gender and severity of behavior problems (Beauchaine, Webster-Stratton, & Reid, 2005; Hautmann, Eichelberger, Hanisch, Plück,
Walter, & Döpfner, 2010; Lavigne, LeBailly, Gouze, Cichetti, Jessup, Arend, Pochyly & Binns, 2007; Lavigne, Dahl, Gouze, LeBailly, & Hopkins, 2014; Sonuga-Barke, Daley & Thompson, 2002; Webster-Stratton, Reid, & Beauchaine, 2013; Werba, Eyberg, Boggs & Algina, 2006). Whereas male or female gender did not predict change in externalizing behavior problems after behavioral parent training in preschoolers (Beauchaine et al., 2005; Hautmann et al., 2010; Lavigne et al., 2007; Sonuga-Barke et al., 2002; Webster-Stratton et al., 2013; Werba et al., 2006), pretreatment severity of externalizing behavior problems was found to be a significant predictor of outcome; children with high levels of externalizing behavior problems before behavioral parent training showed more improvement than children with lower levels (Hautmann et al., 2010; Webster-Stratton et al., 2013).

The influence of parental factors, such as parental psychopathology, parenting style, and parenting self-efficacy on behavioral parent training outcome in preschoolers has been understudied. This is surprising, as behavioral parent training programs are aimed at changing children’s behavior through their parents as mediators. It could well be that various parental factors may influence the capability of parents to learn, practice, and implement specific parenting skills and may therefore play a role in outcome of behavioral parent training. The studies that did examine parental variables as possible predictors of response to behavioral parent training in preschool children mainly concerned parental internalizing problems, such as depressive mood and parental stress (Beauchaine et al., 2005; Lavigne et al., 2007; Sonuga-Barke et al., 2002). In addition to parental internalizing problems, externalizing behavior problems in parents may also be of influence on behavioral parent training outcome in preschoolers. Although parental externalizing problems, such as parental ADHD, disruptive behaviors, and substance abuse, are more often present in parents of young children with disruptive behavior problems, compared to parents of non-ADHD children (Chronis et al. 2003), treatment studies that included these behaviors as possible predictors are still scarce. Parental externalizing problems may, however, disrupt parenting and may lead to a situation of reciprocal influences of difficult to handle child behavior and impaired parental functioning leading to continued disruptive behavior problems (Breaux, Harvey, & Lugo-Candelas, 2014). Therefore, more analyses on the influence of parental externalizing behaviors on behavioral parent training outcome in preschoolers is warranted.

One study found high levels of maternal ADHD symptoms to be associated with less successful behavioral parent training for preschool children (Sonuga-Barke et al., 2002). Also, alcohol abuse in parents may play a role in the effectiveness of behavioral parent training, given that problematic alcohol use of mothers is a risk factor for externalizing behavior
problems in young children, especially when mothers engage in harsh parenting techniques (Conners-Burrow, McKelvey, Pemberton, Mesman, Holmes & Bradley, 2015). Furthermore, preschool sons of alcoholic fathers appear to be at increased risk of self-regulation problems, especially when their fathers show less parental warmth (Eiden, Edwards, & Leonard, 2004). In contrast to these observations, a history of parental alcohol or drug misuse was found to be associated with a better response in two behavioral parent training treatment study in young children with oppositional defiant disorder (ODD) (Baydar, Reid, & Webster-stratton, 2003; Beauchaine et al., 2005). It may, however, well be that current, rather than a history of abuse has a negative impact on behavioral parent training results.

It could also be hypothesized that parents with high levels of antisocial behavior may be less sensitive to behavioral parent training treatment, given that antisocial behavior symptoms in fathers are associated with child conduct problems (LeMoine & Romirowsky Woods, 2015) and in mothers with reduced warmth and sensitivity towards their children (Jaffee, Belsky, Caspi, & Moffitt, 2006). However, to our knowledge, no studies concerning the role of parental antisocial behavior in behavioral parent training success are available.

Finally, parenting style, especially disciplining practices, and parenting self-efficacy may be involved in behavioral parent training treatment outcome. Various studies found an association between inadequate disciplining and elevated disrupted behavior problems in preschool children (Harvey, Metcalfe, Herbert, & Fanton, 2011; Rinaldi & Howe, 2012; Vecchio & Leary, 2006). We also know that parents of young children with disruptive behavior problems have a lower sense of parenting competence (Cunningham & Boyle, 2002; Wittkowski et al., 2016) and exhibit less adequate discipline practices than parents of children without behavior problems (Harvey 2011; Lorber et al. 2014). Low levels of maternal self-efficacy were found to be a predictor for maternal coercion (Bor et al. 2004).

Regarding the association between parenting self-efficacy and outcome of behavioral parent training in preschool children, study findings were mixed. Higher levels of maternal self-efficacy predicted better outcome of parent child interaction therapy (Werba, 2006), whereas another study found no effect of parenting self-efficacy on improvement of the child’s ADHD symptoms after parent training (Sonuga-Barke et al., 2002).

In the present study, we examined the effects of behavioral parent training on disruptive behaviors of referred preschool children in a real world clinical setting, using mothers, fathers, and teachers to assess outcome. Consistent with previous studies, we hypothesized that behavioral parent training would result in decreased disruptive behavior problems in children, with moderate effect sizes. Furthermore, we examined the role of parental
psychopathology, including parental ADHD symptoms, antisocial behaviors, and alcohol use, as well as maternal disciplining and self-efficacy as possible predictors of behavioral parent training outcome. We expected elevated levels of parental psychopathology, low maternal sense of parenting competence, and maternal ineffective disciplining to be associated with worse behavioral parent training outcome. Due to the modest sample size, we were unable to investigate all possible parental predictors. We chose to focus on parental externalizing behaviors, sense of parenting competence and parental discipline style.

Method

Study design
We evaluated the changes in children’s behavior after behavioral parent training treatment with a one group pretest-posttest design, using a double pretest. The time between the initial assessment (T0, the first pre-test) and directly before the start of the behavioral parent training (T1, the second pre-test) was approximately 13 weeks ($M = 12.80, sd = 9.41$). In the waiting period (T0-T1) results of the clinical assessment were reported to the parents and treatment options were discussed. There was no treatment offered during this period. The treatment period (T1- T2, post-test within four weeks after the last treatment session) was approximately 18 weeks ($M = 17.8, sd = 8.93$). We conducted outcome assessments at T0, T1, and T2 for parent-reported child behavior problems, and T1 and T2 for teacher-reports. Furthermore, we collected data on predictor variables at T1.

Participants and procedure
We conducted our study at our outpatient clinic for child- and adolescent mental health, in which parents of preschool children with disruptive behavior problems receive behavioral parent training as part of routine care. As part of our standard diagnostic procedures, ADHD symptoms and other disruptive behavior symptoms were assessed with a semi-structured interview with the parents (i.e., the Dutch version of the Parent Interview for Child Symptoms PICS-4; (Schachar, Ickowicz, & Sugarman, 2000)) and the teacher/caregiver (i.e., the Dutch version of the Teacher Telephone Interview: TTI; (Tannock, Hum, Masellis, Humphries & Schachar, 2002)) we also collected mother’ reports of child problem behavior on the Eyberg Child and Behavior Inventory (ECBI; (Eyberg & Pincus, 1999), as part of our regular assessment procedure.
Our sample consisted of parents of 68 children with behavior problems at home (i.e., score on the Intensity scale of the ECBI ≥ 131 and/or at least 2 oppositional defiant symptoms), who received behavioral parent training between 2010 and 2014. In that period, in 134 families behavioral parent training was indicated, and 83 (62%) actually started the treatment. Fourteen families (10%) did not want any treatment, four families wanted only pharmacological treatment (3%), and fifteen families (11%) could not organize to come to treatment on a regular basis. Furthermore, nine families (7%) preferred care from another organization while the remaining nine families (7%) did not start for a variety of reasons.

We could not analyze data of parents of 15 children who had also received parent training in this period, as they failed to provide adequate T2 ratings: seven T2 assessments were filled in too late and parents of eight children were unable or unwilling to fill in the T2 assessments. These 15 children did not differ from the 68 analyzed children in age, T1 severity of behavior problems, and parental education level.

Twenty-nine of the analyzed families (43%) had received some kind of previous parent counseling but not in the form of a manualized behavioral parent training. None of the children had previous or current pharmacological treatment. Participating parents gave written informed consent to use the routine care assessments for research purposes. The study was approved by the Medical Ethical Committee of the University Medical Centre Groningen.

Characteristics of the analyzed families are presented in Table 1. Although one of the secondary caretakers was a grandmother, we report on secondary caretakers as ‘fathers’. Parents of 66% (n = 45) of the participating children completed all twelve behavioral parent training sessions, while 34% (n = 23) stopped the treatment before the last session (range 1-11 sessions). The mean number of sessions for the whole group was 9.6 (SD = 3.66), with a significant difference between both caregivers, t(53) = 2.37, p = .021, if they both participated in behavioral parent training (n = 53), i.e., mothers received on average one more session than fathers. Reasons for treatment drop out included not being able to manage to come to the outpatient clinic on a regular basis (n = 11; 48%), mostly because of a stressful family situation related to illness or working problems. Eight families (35%) dropped out because behavioral parent training did not meet their expectations. Parents of two children (8.5%) stopped because they felt no need for treatment anymore and two families (8.5%) terminated the treatment because of personal circumstances.
Table 1 Child and family characteristics

<table>
<thead>
<tr>
<th>Child characteristics</th>
<th>n</th>
<th>%</th>
<th>Mean</th>
<th>SD</th>
<th>Range</th>
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<tr>
<td>Number</td>
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<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Male</td>
<td>54</td>
<td>78</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Female</td>
<td>14</td>
<td>22</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Age in years</td>
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<td></td>
<td>4.66</td>
<td>0.88</td>
<td>2.67-5.92</td>
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<tr>
<td>Total IQ</td>
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<td></td>
<td>101</td>
<td>14.2</td>
<td>72-131</td>
</tr>
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<td>ADHD symptoms</td>
<td>68</td>
<td></td>
<td>10.4</td>
<td>3.63</td>
<td>4-18</td>
</tr>
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<td>2.28</td>
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<td>CD symptoms</td>
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<td>0.31</td>
<td>0.94</td>
<td>0-6</td>
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<td>Group educational activity</td>
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<tr>
<td>• Preschool</td>
<td>53</td>
<td>78</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>• Kindergarten</td>
<td>13</td>
<td>19</td>
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<td></td>
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<tr>
<td>• At home with a caretaker</td>
<td>2</td>
<td>3</td>
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<tr>
<td>Family characteristics</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Highest education level</td>
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<td></td>
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<tr>
<td>Low</td>
<td>27</td>
<td>40</td>
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<td></td>
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<tr>
<td>Middle</td>
<td>29</td>
<td>42</td>
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<tr>
<td>High</td>
<td>12</td>
<td>18</td>
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<td></td>
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<tr>
<td>Single mother family</td>
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<tr>
<td>Two parent family</td>
<td>53</td>
<td>78</td>
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</table>
### Maternal characteristics

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<thead>
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<th>Number</th>
<th>Age in years</th>
<th>Biological mothers</th>
<th>Foster mother</th>
</tr>
</thead>
<tbody>
<tr>
<td>68</td>
<td>33.1 4.53 24-44</td>
<td>67 98.5</td>
<td>1 1.5</td>
</tr>
</tbody>
</table>

### Characteristics of the secondary caregiver

<table>
<thead>
<tr>
<th>Number</th>
<th>Age in years</th>
<th>Biological fathers</th>
<th>Foster father</th>
<th>Stepfather</th>
<th>Grandmother</th>
</tr>
</thead>
<tbody>
<tr>
<td>58</td>
<td>36.1 4.58 24-54</td>
<td>51 88</td>
<td>1 1.5</td>
<td>5 9</td>
<td>1 1.5</td>
</tr>
</tbody>
</table>

*Note. ADHD = Attention Deficit Hyperactivity Disorder; ODD = Oppositional Defiant Disorder; CD = Conduct Disorder.*

1 Three children were not testable.

2 33% (n =5) of the single mothers were accompanied by the biological father of the child in the behavioral parent training, 7% (n =1) by her own mother, 7% (n =1) by the stepfather and 53% (n =8) participated alone.

3 9% (n =5) of the biological fathers provided baseline data but did not take part in behavioral parent training and 91% (n =53) did actually participate.
Treatment
In a previous study, we had demonstrated the effectiveness of our behavioral parent training program for behavioral and internalizing problems of school-aged children with ADHD (Van den Hoofdakker, Van der Veen-Mulders, Sytema, Emmelkamp, Minderaa & Nauta, 2007). We adapted the behavioral parent training manual for preschool children (Behavioral Parent Training Groningen – Preschool; BPTG-P). BPTG-P was provided in a group or individual format and consisted of twelve sessions: two-hour group sessions led by two therapists, or one-hour individual sessions led by one therapist. Both formats were comparable in content and structure of the sessions. Therapists were graduated psychologists, trained and experienced in delivering behavioral parent training to parents of children with behavioral problems. Parents could express their preference for the individual or group format and the majority of parents \( n = 60, 88\% \) preferred and started the individual BPTG-P.

The primary focus of the behavioral parent training was to reduce disruptive child behaviors and to increase positive child behaviors. Psycho-education and restructuring of unhelpful and inaccurate cognitions were part of every session. The first treatment phase focused on teaching parents how to observe and report children’s behavior in Antecedent-Behavior-Consequence (ABC) schedules and how to manipulate antecedents to evoke appropriate behaviors (Van den Hoofdakker et al., 2007). Parents were taught to structure the environment, set rules, give instructions, praise appropriate behaviors, and anticipate misbehaviors. The second phase of the treatment focused on contingency management techniques and maintenance training. Treatment was tailored for each child, based on behavior problems selected by the parents in the first treatment session. Furthermore, parents were stimulated to play with their child on a daily basis, in order to increase positive parent-child interactions.

We strongly recommended two-parent families to participate together in the treatment. In case it was not possible for the father to participate, the therapists discussed with the mother how to inform the father about the parent training and how to involve him in homework assignments. We encouraged single mothers to join in with the father of the child or with another important person.

Homework assignments tailored to the specific target behaviors were an important part of the training. Each week the parents read about, and trained the skill that had been introduced in the preceding session. Every session started with discussions about the homework reports from both parents and every session ended with new homework assignments. In between, a new topic was introduced and practiced.
After each session, therapists completed a treatment integrity checklist in which they reported which parts had been included. Topics that had not been covered were postponed to the next session. Supervision was given on a weekly basis and all sessions were video recorded to check adherence to the treatment protocol. Observed adherence to the treatment protocol was high ($M = 96\%$ of all topics covered, $SD = 70\%$, range 79 - 100\%).

Measures
The mothers’ scores on the Intensity Scale of the ECBI (Eyberg & Pincus, 1999), was our primary outcome measure. The ECBI is a 36-item inventory of current disruptive problem behaviors for children aged 2 to 16, consisting of two scales: the Intensity Scale (ECBI-I) measuring the frequency of child behavior problems on a 7-point Likert scale (1 = never to 7 = always), and the Problem Scale (ECBI-P) reporting if the item-behavior is a problem or not (ECBI-P) for the parent on a dichotomous scale (0 = no, 1 = yes). The cut-off the Intensity Scale is 131 (higher scores indicating that the child potentially has a significant problem) and of the Problem Scale 15 (higher scores indicating that the parent is significantly distressed by the child’s behavior; ECBI; Pincus & Eyberg, 1999). Mothers’ ratings on the ECBI-P were a secondary outcome measure. Cronbach’s coefficient $\alpha$ (which provides a lower bound for the reliability of the scale) equaled .92 for both parents’ ECBI-I in our sample. Fathers’ ratings on the ECBI-I and ECBI-P were also secondary outcome measures as well as teachers’ reports of externalizing behavior problems on the Externalizing Scale of the Caregiver-Teacher Report Form (C-TRF, (Achenbach & Rescorla, 2000)), a 36-item subscale of the preschool version of the TRF consisting of attention problems and disruptive behaviors. On the C-TRF, the teacher scores current child behavior, now or within the last two months, with 0 (not true), 1 (sometimes true), or 2 (very true or often true). Cronbach’s coefficient $\alpha$ equaled .96 for the Externalizing Scale in our sample.

A number of possible parental predictors were assessed in both parents at baseline. We used the total score on the 18-item Adult ADHD Rating Scale (AARS; (Barkley & Murphy, 1998)) to assess parental ADHD symptoms. Ratings are on a 4-point Likert scale ranging from 0 (never or rarely) to 5 (nearly all the time) over the last 6 months. Cronbach’s coefficient $\alpha$ equaled .92 for the mothers’ and fathers’ scores on the AARS in our sample. Parental antisocial behavior was measured with the total score on the Subtypes of Antisocial Behavior Questionnaire (STAB; (Burt & Donnellan, 2009)), a 32-item self-rating scale on aggressive behavior in adults during the last year scored on a 5-point Likert scale ranging from 1 (never) to 5 (nearly all the time). Cronbach’s coefficient $\alpha$ equaled .82 for the both parents’ STAB
in our sample. Parental frequency of alcohol use, binge drinking, typical drinking patterns, and harm caused by drinking was assessed by the Alcohol Use Disorders Identification test (AUDIT; World Health Organization, (Babor & Higgins-Biddle, 2001)). This questionnaire consists of ten items on frequency and amount of alcohol use, typical drinking patterns, and harm caused by drinking, with ratings between 0 (never, 1 or 2, no) and 4 (4 or more times a week, 10 or more, daily or almost daily, yes). Ratings of ≥ 8 in men and ≥ 7 in women are considered to indicate problematic alcohol use (Babor & Higgins-Biddle, 2001). Cronbach’s coefficient α equaled .72 for mothers’ and fathers’ scores on the AUDIT in our sample.

The mothers’ total score on the Parenting Scale (PS; (Arnold, O’Leary, Wolff, & Acker, 1993)) was used as a measure of dysfunctional parenting style and extent to which parents are able to set rules in various discipline situations. The PS consists of 30 items, scored on a 7-point Likert scale, varying from 1 (always) to 7 (never). A low PS score indicates an effective disciplining practice. Cronbach’s coefficient α equaled .83 for mothers’ PS in our sample. The mothers’ total score on the Parenting Sense of Competence Scale (PSOC; (Johnston & Mash, 1989)) was used to measure parenting satisfaction and parenting self-efficacy regarding the parenting role. The PSOC consists of 16 items, scored on a 6-point Likert scale, varying from 1 (strongly agree) to 6 (strongly disagree). A low PS score indicates an effective discipline strategy while a high PSOC score indicates stronger sense of competence. Cronbach’s coefficient α equaled .84 for mothers’ PSOC in our sample.

Statistical analysis
Changes in ECBI-I and ECBI-P ratings for mothers and fathers separately were analyzed with repeated measures ANOVA, using the available parental data from T0 to T1 (n = 67) and from T1 to T2 (n = 68). The same was done with regard to changes in teachers’ reports on the Externalizing Scale of the TRF (TRF-E) from T1 to T2. Outcome data were analyzed with an intention-to-treat approach, which means that T2 data of all participants were included, irrespective of the number of treatment sessions they had received. With repeated measures ANOVA, with a Greenhouse-Geisser correction in case our data violated the assumption of sphericity. We also measured overall change of mean outcome scores between the initial assessment (T0, first pre-test) and post-treatment (T2), with pair-wise post-hoc T0-T1 and T1-T2 comparisons in case of a significant overall time effect. Significant P values were adjusted with the Holm-Bonferroni procedure, to correct for multiple testing (Gaetano, 2013). To evaluate the clinical significance of the results based on changes in mothers’ and fathers’ scores on the ECBI-I and ECBI-P from T1 to T2, effect sizes were calculated with Cohen’s d.
We explored discrepancies between parents on parenting stress and parental psychopathology using independent t-tests. To assess the predictive value of parental and parenting variables two multiple regression analyses were conducted, with post-treatment scores (T2) from mothers on the ECBI-I and ECBI-P, respectively, as dependent variables. First, to control for baseline effects on the outcome measure at T2, the outcome measure at T1 was entered in both regression analyses. In a second step, we added both mothers’ and fathers’ scores at pre-treatment (T1) on parental characteristics (AARS, STAB, AUDIT). In a third step, mothers’ ratings on parenting factors (PS, PSOC) were added to significant parental characteristics. Predictors that were not significant were removed from the analyses.

We considered the variables ‘received some kind of previous parent counseling’ and ‘individual or group format’ both as covariates in the repeated measures ANOVA, and as control variables in the regression analyses, but they were removed in all analyses because of non-significance.

In case of more than half items missing, the scale was discarded from analyses. If there were guidelines available on how to deal with missing items, we followed these guidelines. In case of no such rules and less than half missing values for a scale, these values were replaced with the mean of other items of the scale. In case of more than 50% items missing, the scale was discarded from analyses. In total, < .1% of the total item scores, randomly distributed among scales, assessment timepoints, and participants, were missing.

The statistical significance level was set at $p < .05$. All analyses were performed in the Statistical Package for the Social Sciences (SPSS).

Results

Changes in child behavior
Parental and teacher or caregivers’ ratings on child’s behavior problems are listed in Table 2. Repeated measure ANOVAs revealed that mean ECBI scores differed significantly between T0 and T2, both on mothers’ ECBI-I, $F(1.52, 100.) = 23.0, p < .001$, and ECBI-P ratings $F(2.0, 122) = 32.6, p < .001$, as well as on fathers’ ECBI-I, $F(1.66, 71.2) = 12.0, p < .001$, and ECBI-P, $F(1.70, 66.1) = 16.9, p < .001$. Post hoc tests showed that between T0 and T1 there were no significant differences in maternal ECBI-I ($p = .561$) and ECBI-P ($p = .792$) reports, and neither did fathers report changes on both ECBI-I ($p = .988$) and ECBI-P ($p = .417$). In contrast, after the behavioral parent training phase (from T1 to T2), mothers and fathers reported significant improvements on both scales of the ECBI, with moderate to large effect sizes (range 0.51 - 0.87,
<table>
<thead>
<tr>
<th>Variable</th>
<th>Initial assessment (To, first pre-test)</th>
<th>Pre-treatment (T1, second pre-test)</th>
<th>Post-treatment (T2)</th>
<th>Cohen's d</th>
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<tr>
<td></td>
<td>n</td>
<td>Mean</td>
<td>SD</td>
<td>Range</td>
</tr>
<tr>
<td>Mothers’ ECBI-Intensity</td>
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<td>158</td>
<td>23.8</td>
<td>118-219</td>
</tr>
<tr>
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<td>19.4</td>
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</tr>
<tr>
<td>Fathers’ ECBI-Intensity</td>
<td>52</td>
<td>145</td>
<td>22.0</td>
<td>103-202</td>
</tr>
<tr>
<td>Fathers’ ECBI-Problem</td>
<td>48</td>
<td>18.4</td>
<td>7.65</td>
<td>5-34</td>
</tr>
<tr>
<td>Teachers’ TRF-Externalizing</td>
<td>58</td>
<td>27.4</td>
<td>16.2</td>
<td>1-58</td>
</tr>
</tbody>
</table>

Note. ECBI = Eyberg Child Behavior Inventory; TRF = Teacher Report Form.
t test values, Holm–Bonferroni adjusted p values * p < .05. ** p < .01. *** p < .001.
see Table 2). Teachers also reported significant changes in externalizing behavior problems after behavioral parent training, the effect size was small (see Table 2).

**Predictors of change**

On the predictor variables, parents only differed in alcohol use, with mothers \((M = 1.88,\) range 0 - 7) drinking significantly less, \(t(120) = -4.84, p < .001,)\) alcohol than fathers \((M = 4.14,\) range 0 - 15). There were two mothers with problematic alcohol use (AUDIT scores ≥ 7) participating in our study and eight fathers (AUDIT scores ≥ 8), who all had a partner with non-problematic alcohol use.

Results on the hierarchical multiple regression analyses are reported in Table 3. Higher scores on the ECBI-I before treatment were associated with higher scores after behavioral parent training. It appeared that 38% of the variance in ECBI-I scores at T2 could be predicted by the ECBI-I score at T1 (see Table 3). Also, higher mother-ratings on ECBI-P at T1 were associated with a higher score on the ECBI-P after treatment, accounting for 21% of the variance (see Table 3).

Second, the multiple regression analyses revealed that more problematic alcohol use in fathers predicted higher scores on the ECBI-P at T2 (see Table 3), and mothers rating themselves as less adequate in disciplining before treatment predicted lower scores on the ECBI-I after treatment (see Table 3). None of the other factors (i.e., parental ADHD, parental antisocial behavior, and maternal parenting self-efficacy) predicted the ECBI-I and -P ratings after treatment.

**Discussion**

In the current study, we examined the effectiveness of behavioral parent training in referred preschool children’s disruptive behavior problems and the role of various possible parental predictors of treatment response. Fathers and mothers reported significant and large improvements of children’s behaviors after behavioral parent training, both in intensity and number of problematic behaviors (effect sizes ranged from 0.51 - 0.87). Especially the father reports on child outcome are informative, as these reports are scarce (Rimestad et al., 2016). Although we did not include a control group in our study design, the significant improvements after behavioral parent training stand out from the non-significant changes during the waiting list period. Therefore, it may be assumed that the reductions of the
Table 3 Hierarchical Multiple Regression Analyses predicting change in disruptive behavior problems after behavioral parent training with parental factors and maternal parenting factors

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Intensity of disruptive behavior problems after treatment (ECBI-I, T2)</th>
<th>Number of disruptive behavior problems after treatment (ECBI-P, T2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R²</td>
<td>se B</td>
</tr>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>0.38</td>
<td>0.21</td>
</tr>
<tr>
<td>ECBI-I before treatment (T1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>20.4</td>
</tr>
<tr>
<td>ECBI-P before treatment (T1)</td>
<td></td>
<td>0.13</td>
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<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ECBI-P before treatment (T1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fathers’ alcohol use (AUDIT)</td>
<td></td>
<td></td>
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<tr>
<td><strong>Step 3</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>0.44***</td>
<td></td>
</tr>
<tr>
<td>ECBI-I before treatment (T1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.12</td>
</tr>
<tr>
<td>ECBI-P before treatment (T1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mothers’ parental effectiveness in disciplining (PS)</td>
<td></td>
<td>0.19</td>
</tr>
</tbody>
</table>

Note. ECBI = Eyberg Child Behavior Inventory; AUDIT = Alcohol Use Disorders Identification test; PS = Parenting Scale.
* p < .05. ** p < .01. *** p < .001.
disruptive behaviors were not merely due to time. Moreover, also the more independent teachers reported improvement of child behavior after behavioral parent training treatment points to true effects. Thus, also in the natural setting of an outpatient mental health clinic results behavioral parent training in significant improvements of disruptive behaviors.

Parents not only indicated improved behavior in their children but also experienced fewer child behaviors as problematic after behavioral parent training. This result may be due to the cognitive interventions that were part of the behavioral parent training program and that were aimed to learn to differentiate between developmentally appropriate and disruptive child behaviors, to increase parental understanding of disruptive behaviors in a developmental context, and to establish realistic expectations of the possibilities to change the child’s behavior. However, further research is needed to investigate if changes in parental cognitions are indeed related to more tolerance towards children’s disruptive behaviors.

Although treatment attendance appeared to be high, about one third of the parents dropped out of the treatment, mostly because they could not manage to organize participation in behavioral parent training on a regular basis. Parents of preschool children, who spend most of their time at home and need to be continuously monitored, may have more difficulties to attend to treatment than parents of school-aged children. Offering child care for the children in the family during the behavioral parent training sessions may enhance presence at the treatment sessions (Trillingsgaard et al., 2014). For some families, it may be necessary to provide behavioral parent training at home, because attending clinic-based behavioral parent training sessions may be too demanding.

We found that pretreatment level of behavior problems was an important predictor of treatment outcome, while parental factors only played a modest role. In contrast with findings of the Multimodal Treatment Study of children with ADHD (Hoza, Owens, Pelham, Swanson, Conners, Hinshaw & Arnold, 2000), behavioral parent training in our study was most effective in children from mothers rating themselves as less adequate in disciplining before treatment, perhaps due to room for improvement in mothers who showed less good parenting before treatment. Another explanation may be that mothers who consider themselves already as effective in disciplining before the treatment are less receptive to therapists’ advices concerning changes in parental behaviors. It could also be argued that mothers who perceive themselves as good in disciplining tend to attribute the behavior problems more to the child and less to their own parenting role and therefore are less willing to change their own behaviors.
Alcohol use in fathers played a role in the amount of behavior problems after behavioral parent training as well. Mothers perceived more behavior problems in their children after treatment in case fathers were currently more problematic alcohol users. Large drinking discrepancies between partners have been shown to be negatively associated with relation satisfaction, especially for young couples with children (Foulstone, Kelly, Kifle, & Baxter, 2016). Having a partner with high alcohol consumption may lead to relational stress and more parenting responsibilities in mothers. It may be more difficult for these mothers to implement and practice the learned parenting skills because of lack of support or negative parenting practices of their partners. Therefore, it could be that mothers with a partner drinking a lot of alcohol experience their children's behavior more often as demanding.

We found no associations between parental ADHD and response to behavioral parent training, despite presence of high levels of self-rated ADHD in almost a third of the parents. This finding is in contrast with a previous preschool study (Sonuga-Barke et al., 2002), but in line with an earlier study from our group (Van den Hoofdakker, Nauta, Van der Veen-Mulders, Sytema, Emmelkamp, Minderaa & Hoekstra, 2010). However, the fact that parental ADHD was not predictive of response to behavioral parent training may be related to the sample, as those with lacking organizational skills did not even start behavioral parent training (11% of otherwise suitable families).

Also, pretreatment maternal parenting satisfaction and parenting self-efficacy was not associated with behavioral parent training outcome. Finally, antisocial behavior in parents was also not found to be predictive for changes in children's behavior after behavioral parent training, perhaps because of low parental ratings on the STAB.

**Limitations**

A strength of our study was the embedding within clinical practice and the use of mother, father, and teacher outcome ratings. However, a number of limitations must also be acknowledged, most notably the lack of a control group and the modest sample size. Because of no control group, the possibility remains that factors other than the intervention produced the effect, although no effects were reported in the waiting period before the intervention. The modest sample size may explain why we did not find other significant predictors than the mother-rated level of dysfunctional parenting and alcohol use in fathers for changes in children's disruptive behavior after behavioral parent training.
Furthermore, we only used information from self-report questionnaires and not from blinded observers. Future research on divergence and convergence between self-ratings and blinded observational data of child and parenting behavior should provide additional important information on this topic.

**Clinical implications**

Behavioral parent training in a real-world outpatient mental health setting clearly improves preschool children’s disruptive behavior problems. Furthermore, behavioral parent training is useful to help parents experience fewer behaviors as troublesome, maybe due to a better understanding of their child and more realistic expectations. However, about one third of the parents for whom behavioral parent training was indicated, could not manage or were not motivated to participate in behavioral parent training and never started behavioral parent training, thus refraining from an effective treatment. This highlights the importance of motivating and facilitating parents to actually participate in behavioral parent training. Special formats may be needed for families who are not able to participate, such as home-based behavioral parent training.

All in all, behavioral parent training is a valuable intervention for parents of young children with disruptive behavior problems, especially for those that are open to this intervention and can manage to participate. Behavioral parent training may be particularly useful when mothers perceive themselves as inadequate in disciplining practices. Finally, alcohol problems in fathers may be targeted before or during behavioral parent training, but we do not know if such an additional intervention will enhance behavioral parent training outcome.

**References**


