

Health and Disability

Assessing the effectiveness of the ‘Incredible Years[®] parent training’ to parents of young children with ADHD symptoms – a preliminary report

TEA TRILLINGSGAARD,¹ ANEGEN TRILLINGSGAARD¹ and CAROLYN WEBSTER-STRATTON²

¹Aarhus University, Aarhus, Denmark

²University of Washington, Seattle, USA

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This study examined the effectiveness of an evidence-based parent training program in a real-world Scandinavian setting. Parents of 36 young children with or at risk of Attention Deficit Hyperactive Disorder (ADHD) self-referred to participate in the Incredible Years[®] Parent Training Program (IYPT) through a Danish early intervention clinic. Using a benchmarking approach, we compared self-report data with data from a recent efficacy study. Eight out of nine outcome measures showed comparable or higher magnitude of effect from pretest to posttest. Effects were maintained or improved across six months. The methodology of this study exemplifies a rigorous but feasible approach to assessing effectiveness when evidence-based US protocols are transferred into the existing Scandinavian service delivery. Findings suggest that IYPT can be implemented successfully as an easy-access early intervention to families of children with or at risk of ADHD.

Key words: Attention Deficit Hyperactivity Disorder, ADHD, young children, parent-training, effectiveness, benchmarking.

Tea Trillingsgaard, Department of Psychology and Behavioural Sciences, Aarhus University, Bartholins Alle 9, DK-8000 Aarhus C, Denmark.

Tel: +45 87165843; e-mail: teatri@psy.au.dk

INTRODUCTION

Attention Deficit Hyperactivity Disorder (ADHD) is a complex and heterogeneous neurodevelopmental disorder. The core symptoms are inattention, impulsivity, and over-activity. In order to receive the ADHD diagnosis these symptoms are required to be pervasive across settings and to cause significant impairment to the child’s functioning (Coghill, Bonnar, Duke, Graham & Seth, 2009). In a meta-analysis of more than 100 studies worldwide, the prevalence of ADHD in school-aged children was estimated to 5.2%, making ADHD one of the most common mental disorders in childhood (Polanczyk, deLima, Horta, Biederman & Rohde, 2007). Furthermore, recent US estimates indicate a rising ADHD prevalence rate (Pastor & Reuben, 2008). In Denmark, ADHD ranks as the most frequently registered mental health diagnosis among children and youth (Sundhedsstyrelsen, 2013) and there has been a rapid growth in the number of children referred for diagnostic evaluation through child psychiatric services (Socialstyrelsen, 2013). The increasingly excessive load on child and adolescent psychiatry services combined with long waiting lists delay access to help during a critical period of children’s development. This situation has emphasised the need for simple yet effective interventions which are more readily available for parents with young children with or at risk of ADHD.

Parents of pre-schoolers with ADHD perform twice as many controlling and negative parenting interactions with their children as compared to positive ones (Cunningham & Boyle, 2002). Hostile or coercive interaction is theorized to lead to conduct problems (Patterson & Yoerger, 2002). About 70% of the pre-schoolers who meet diagnostic criteria for ADHD will also meet criteria for at least one additional psychiatric diagnosis, most commonly oppositional defiant disorder (ODD) or conduct

disorder (CD). Indeed, ODD is present in 52.1% of all ADHD cases which are presented clinically (Posner, Melvin, Murray *et al.*, 2007). Thus, an important argument for making early interventions accessible for parents, is that the enhancement of nurturing parenting and positive relationships can be a protective factor guarding against the potential cascade of hostile interactions with family, peers, and teachers; ultimately preventing the development of conduct problems.

The efficacy of the program *The Incredible Years[®] Parent Training* (IYPT) for children aged 2–8 with ODD/CD has been demonstrated in numerous randomized controlled trials (RCTs) by the program developer Carolyn Webster-Stratton and colleagues at the University of Washington (for review see Webster-Stratton & Reid, 2010). Overall, more than 10 RCTs by the developer found that the IYPT programs improve parental attitudes and parent-child interactions and reduce harsh discipline and child conduct problems. In addition, the results of the IYPT has been replicated in several effectiveness trials by independent investigators in applied mental health clinics with families of children diagnosed with ODD/CD including a British (Scott, Spender, Doolan, Jacobs & Aspland, 2001), a Norwegian (Larsson, Fossum, Clifford, Drugli, Handegård & Mørch, 2009), and a Swedish study (Axberg & Broberg, 2012). Recently a meta-analytic review concluded that IYPT parent training is “well-established” based on 50 studies targeting young children with disruptive behavior (Menting, Oribio de Castro & Matthys, 2013).

When it comes to young children with ADHD, behavioral treatment research is not extensive; however parent training have shown some promising outcome (for review see Webster-Stratton & Reid, 2012). Due to the co-occurrence of ODD/CD and ADHD in young children, children with comorbid ODD and

ADHD appear in many of the earlier trials. Some findings indicate that IYPT also reduce ADHD-symptoms (Drugli, Larsson, Fossum & Mørch, 2010; Hartman, Stage & Webster-Stratton, 2003) although a comorbid ADHD diagnoses have been associated with poor treatment outcome, possibly due to the fact that comorbid ODD and ADHD constitutes a more severe form of child conduct problems (Fossum, Mørch, Handegård, Drugli & Larsson, 2009). This underscores a need for existing programs to be adapted to young children with ADHD specifically and evaluated in relation to this clinical group. Though ADHD may constitute a specific challenge, there is overall support for the choice of parent training (in comparison to other psychosocial treatments) when it comes to young children with ADHD (for review see LaForett, Murray & Kollins, 2008; McGoey, Eckert & DuPaul, 2002).

Lately, a handful of RCTs have documented that parent training programs designed for young children with ADHD produce positive effects on both parental competence and ADHD symptoms. This was found for the Incredible Years[®] Parent and Child Training Programs (see Webster-Stratton, Reid & Beauchaine, 2011, 2012; for studies using the BASIC version see Azevedo, Seabra-Santos, Gaspar & Homem, 2013; Jones, Daley, Hutchings, Bywater & Eames, 2007, 2008; Perrin, Sheldrick, McMenamy, Henson & Carter, 2014) and for the New Forest Parenting Program (Thompson, Laver-Bradbury, Ayres *et al.*, 2009). However, to the best of our knowledge, we have not seen data on how effects generalize when protocols adapted for young children with ADHD are applied under real world conditions and in a Scandinavian culture.

Translating efficacious practices to real world settings to produce effective results is one of the more challenging issues regarding delivery of evidence-based programs (Weersing, 2005). A community setting may apply less rigid standards of diagnostic evaluation (e.g., intake based on clinical evaluation of self-referred parents). This can lead to a more diverse population of children than in original studies. Typically, lower attendance and higher attrition are observed in studies of community samples and may compromise dosage. Moreover, programs may be adapted to fit unique demands and resources in particular settings. Finally, a demand for adaptation may come from cross-cultural differences in child rearing practices, norms and values.

The current study was conducted in a Danish early intervention clinic; thus in a real world setting. With benchmarking as the analytic approach, we included nine measures previously used as outcome measures in a recent efficacy study of a combined IY parent and child training program (Webster-Stratton *et al.*, 2011, 2012). The current study tested whether the effectiveness of the IYPT, to parents of young children with or at risk of ADHD, could be maintained when delivered without the adjunct child treatment program and when parents self-referred for treatment. Thus, differences in program delivery included (1) no adjunct child program, (2) less formal standards for diagnostic evaluation of children and (3) minor adaptations to the format of sessions in order to meet local demands.

At the root of benchmarking is the aim of reaching similar outcomes. In line with this, we hypothesized that there would be no differences in the size of effects reported by parents in the current Danish study (from now on termed the Danish study)

compared to the results of the American efficacy study reported by Webster-Stratton *et al.* (2011, 2012) (from now on termed the efficacy study). To account for the likelihood of the opposite finding (treatments not being comparable in effect), we conducted all analyses using two-tailed tests.

METHODS

Participants

Participants were 36 self-referred families with a child between the ages of three and eight who displayed ADHD symptoms. Of the 36 families, 35 had previously been in contact with public services. Twelve out of 36 children (33%) had been through diagnostic evaluation and received an ADHD diagnosis prior to contacting the clinic. More of remaining children were on a waiting list for diagnostic evaluation. None of the families were previously offered participation in parent training. The children's mean age was 6.4 ($M = 77.1$ months, $SD = 18.7$ months) and 75% were boys. Most parents were in their thirties ($M = 34.4$ years, $SD = 6.3$). The average length of the parents' education was 15.3 years, ranging from not completing high school (16.1% of mothers and 17.9% of fathers/partners) to having a bachelor degree or above (18.8% of mothers and 32.1% of fathers/partners). Skilled workers constituted the largest single group within both genders (25.8% of mothers and 35.7% of fathers/partners), see Table 1.

Study setting

At the time of this study, the waiting list for a diagnostic evaluation at the regional child and adolescent psychiatric facility was lengthy. Furthermore, any local access to parent training was limited. Center for ADHD was established in 2010, with the purpose of increasing access to parent-oriented interventions for children with, or at risk of ADHD. Parents of young children (3–8 years of age) with ADHD symptoms could self-refer to the clinic. Children were not required to have a formal psychiatric diagnosis. The clinic held yearly informational meetings for leading professionals within child and family mental health services in the district. These professionals were encouraged to provide

Table 1. Comparison of sample characteristics

Variable	Danish study ($N = 36$)	Webster-Stratton <i>et al.</i> (2011) Intervention group ($N = 49$)
Child's sex (% male)	75	73
Child's age (months)	77.1 (18.7)	64.1 (11.3)
Child's grade (%)		
-Preschool	15 (41.7)	22 (45)
-Kindergarten	6 (16.6)	17 (35)
-1st Grade	15 (41.7)	10 (20)
Child with ADHD diagnosis (%)	29 (81) ^a	49 (100) ^c
Child with co-morbid behavior disorder ^b (%)	18 (50) ^b	26 (53) ^c
Primary parent partnered (%)	20 (56)	38 (77)
Primary parent's age (%)	34.4 (6.3)	37.3 (6.0)
Primary parent's education years	15.3	15.6 (2.3)
Number of children in home	1.8 (0.7)	1.8 (0.7)

Notes: Continuous variables are expressed as M (SD). ^a diagnostic probability score (above 95%ile) based on Conners 3 ADHD index at intake (Conners 3AI, 2009). ^b diagnostic high risk prediction based on Strength and Difficulties Questionnaire at intake (SDQ; Goodman, 1999). ^c diagnosed at intake (Webster-Stratton *et al.*, 2011).

information about the clinic to staff, which was encouraged to provide information to parents. Parents were, however, required to self-refer based on this information. Information to parents and professionals about the clinic, the program (IYPT) and the target group was also posted on the clinic website, announced in a local newspaper and distributed with flyers.

Procedure

The parents were admitted to the IY parent training groups on the basis of a clinical evaluation of the child's ADHD symptoms. During the initial telephone contact, the parents were asked to describe their child's behavior and its impact on family life. The parents were also informed about the requirements and obligations of the program. All parents with children in the target group were offered a home-visit intake interview by two clinical psychologists. The foci of the interview were (a) current problem behavior, (b) child developmental history, (c) everyday family life, (d) family relationships and network, and (e) parenting practices. The admission to the parenting program was based on the overall assessment of symptoms of ADHD and current needs of the family. No requirements were made concerning fulfillment of formal ADHD criteria such as cut-off scores on rating scales or diagnostic instruments. A total of 41 families contacted the clinic during the intake to the Danish study. Five families chose to withdraw prior to the intake interview due to the relatively high demands on time and effort devoted to the program. Based on the intake interview, all of the remaining 36 families were eligible for treatment and chose to enrol. Parents signed an informed consent concerning participation in the evaluation of the effectiveness of the intervention.

Pretest measures were obtained no later than three weeks prior to the start of the intervention and posttest measures were obtained no later than four weeks after terminating the program. Follow-up assessments were obtained six months after terminating treatment.

Measures

Parent reports of child behavior. Conners 3 ADHD Index (Conners 3AI; Conners, 2009) contains the 10 highest loading items from the full-length form that best differentiates youth diagnosed with ADHD from youth in the general population. The Conners manual offers a 3ADHD index probability score (DSM-IV-TR) calculated on basis of normative data from the full-length Conners 3. Coefficient α ranged from .79 to .87 across pretest, posttest and follow-up measures in the Danish sample. The efficacy study applied a 57-item instrument from Conners' Parent Rating Scale – Revised (Conners, Sitarenios, Parker & Epstein, 1998). Nine of these items are identical, and one item is almost identical with Conners 3AI used in the Danish study. The comparison was conducted by retrieving data on the comparable 10 items from the original dataset used by Webster-Stratton and colleagues (2011).

Eyberg Child Behavior Inventory (ECBI; Eyberg & Pincus, 1999). The ECBI is a 36-item inventory of conduct problem behaviors for children aged two to 16. Two summary scores are calculated to measure the number of conduct problems ($\alpha = .76 - .80$) and problem intensity ($\alpha = .81 - .80$).

Social Competence Scale (P-COMP; Conduct Problems Prevention Research Group; CPRG, 1999a, 1999b). The P-COMP consists of 12 items that assess parental perceptions of children's competence on two subscales; social competence ($\alpha = .71 - .78$) and emotion regulation ($\alpha = .76 - .67$).

The Strengths and Difficulties Questionnaire (SDQ; Goodman, 1999). Based on parent information, scores were obtained within the following areas: Overall stress, emotional distress, conduct difficulties, hyperactivity and attention difficulties, difficulties getting along with other children, kind and helpful behavior, and impact of any difficulties on the child's life. For the current report, only pretest data on the five items included in the *conduct* subscale was used ($\alpha = .43$).

Parent reports of parenting behavior and adjustment. Parenting Practices Inventory (PPI; Conduct Problems Prevention Research Group, 1996). This questionnaire measures the parent's use of specific rearing practices. Four summary scores were included in this project (a) appropriate discipline ($\alpha = .76$), (b) praise and incentive ($\alpha = .80 - .81$), (c) harsh and inconsistent discipline ($\alpha = .78 - .84$), and (d) physical punishment ($\alpha = .79 - .81$).

Intervention. In the efficacy study, the newest version of IYPT (Webster-Stratton & Reid, 2008) was conducted with 20 weekly 2-hour sessions including four sessions from the advanced IY program. Sessions were conducted with six families per group and children participated in parallel IY child training groups (Webster-Stratton *et al.*, 2011).

In the Danish study, the same version of the basic parent program plus four sessions from the advanced program was offered as in the efficacy study. This version has a treatment protocol adapted for preschool children with ADHD. In comparison to the basic versions targeting disruptive behavior in general, this version incorporates tools of use for parents of children with ADHD. There is more focus on academic persistence, social coaching, establishing predictable household routines and schedules, emotion regulation strategies, teaching children to problem solve, and helping parents understand the development of children with ADHD. In order to meet local demands, including expectations from Danish parents, some of the sessions were adapted in format. Two sessions were offered as individual consultations, and two sessions were offered as evening workshops. In one evening workshop parents invited their social network (e.g., grandparents, neighbours, teachers) to an introduction to the IY program and in another workshop all parents from the three simultaneously conducted groups met to discuss topics of parenting. The remaining 16 sessions were conducted as 2-hr weekly sessions with six families per group. Children and their infant siblings were offered childcare during the 16 parent training groups, but attendance was optional and not registered. The childcare providers were psychology students supervised by a psychologist trained in IY child groups. The students organized play activities for the children following behavioral principles for IY child training, but not the manualized sessions. The majority of children attended childcare.

Similar to the Webster-Stratton *et al.* (2011) efficacy study, the Danish study promoted fidelity by using standard manuals and protocols for the parent groups. In addition, group leaders were either accredited group leaders or were undergoing the accreditation process. During weekly supervision, group leaders, who received support and consultation from an IY-accredited mentor, reviewed videotapes from all parent sessions. Highly skilled group leaders were a characteristic of the Danish clinic (and similar to the group leaders in the efficacy study). Three of the four group leaders conducting the Danish parent training were experienced clinical psychologists who have specialized in ADHD in children. The fourth was an IY-accredited health visitor and nurse. The group leaders completed protocol checklists after each session, indicating which vignettes, activities, and practice exercises were used in each session. Reviews of session protocols and videos were sent to the program developer Webster-Stratton who confirmed that all groups were shown all required vignettes and completed all practice activities.

Analytic approach

In benchmark studies, a gold-standard treatment study from the literature is selected, comparable outcome measures are obtained in the applied setting, outcomes are compared point-by-point, and reasons for differential outcomes are discussed (Weersing, 2005). In the following, the benchmarking method is applied as an analytic strategy to test the hypotheses of generalizability of effects found in the efficacy study to effects obtained in the Danish study.

We compare the size of effect from each of the two studies by calculating Cohen's *d* effect sizes on pretest to posttest changes in the intervention condition in both studies with regard to nine similar outcome

measures. With the test statistics z we compare effect sizes across studies:

$$z = (d_{\text{Danish}} - d_{\text{efficacy}}) / (Sd_{\text{Danish}} + Sd_{\text{efficacy}}).$$

With d being Cohen's d of pretest to posttest change and S being the variance.

Second, we estimate the clinical significance in the Danish study by specifying the percentage of children who scored above a predefined clinical cut-off at pretest and their trajectories in relation to the cut-off from pretest to posttest and from pretest to follow-up assessment. To avoid relying solely on cut-off values we also calculated the percentage of children experiencing reliable change in symptom levels, using the Reliable Change Index (RCI; Jacobson & Truax, 1991):

$$\text{RCI} = 1,96 \times \text{SEdiff},$$

$$\text{SEdiff} = \sqrt{2 \times \text{SE}^2} \text{ and } \text{SE} = \text{SD} \times \sqrt{1 - r_{xx}}$$

SD being the standard deviation of the sample, and R_{xx} being the reliability of the measure.

In the reporting of results, we present benchmarked findings on changes from pretest to posttest. We report clinical significance of changes from pretest to follow up in the Danish study. Due to the fact that the follow up period was 6 months in the Danish study and 12 months in the efficacy study, results from the follow up period are not compared.

RESULTS

Prior to analysis, the data was screened for errors. The percentage of missing values was fairly small (3–6%). Thus, the Expectation Maximization algorithm, which has been demonstrated to be an effective method of dealing with missing data (Bunting, Adamson & Mulhall, 2002), was performed to impute missing data on all included scales.

Comparison of sample characteristics and diagnoses

Descriptive statistics from the Danish sample and the efficacy sample are presented in Table 1. Compared to the efficacy study, the mean age of the Danish children was 13 months higher, the parents were younger, and the mothers were less frequently partnered. To compare symptom severity across the two studies, we relied on diagnostic probability measures of risk of ADHD diagnosis, based on Conners 3AI (Conners, 2009), and risk of behavior disorder, based on SDQ predictive algorithm (Goodman, 1999). Specifically, on the basis of parent information (at baseline), a Conners 3AI probability score was calculated indicating the likelihood of an ADHD diagnosis (above the 95 percentile). The conduct problem subscale of the Strengths and Difficulties Questionnaire (SDQ) was used to calculate the likelihood of having a behavioral disorder severe enough to warrant a diagnosis. These probability scores are estimates only. Given that their probabilities are reliable, the two study samples were highly similar with regard to the occurrence of behavior disorders (53% diagnosed with comorbid ODD in the efficacy study compared with 50% estimated high risk of a behavior disorder in the Danish sample). With regard to the occurrence of ADHD, all children in the efficacy study were diagnosed, compared to 81% of the Danish sample being likely to meet all diagnostic criteria. The similarity between the two study samples with regard to the occurrence of obtained diagnoses (the efficacy study) and the

predicted diagnoses (the Danish Study) is supported by the similarity between the samples with regard to the baseline scores on symptoms scales (Conners 3 AI and the Eyberg Intensity and Problem Scales, see Table 2).

To rule out the possibility that treatment effects in the Danish sample were biased by the higher age in the Danish sample, we conducted a series of mixed between-within subjects analyses of variance on all symptom measures by age group. Higher age at baseline was not significantly associated with more (or less) reduction in symptoms over time.

Comparison of intervention dose

During the Danish intervention, the primary parents attended on average 81% of the 16 2-hours sessions ($M = 13.0$, $SD = 2.9$). In 66% of the families a second parent or parents' partner attended one or more of the sessions. This group of partners attended on average 75% of sessions ($M = 12.0$, $SD = 3.8$). At the two workshops, no information on attendance was obtained, and thus this treatment is not included in the calculation of dosage.

In the efficacy study, mothers attended 92.5% of sessions ($M = 18.5$, $SD = 4.2$; out of 20 sessions) and partners attended 85.5% of sessions ($M = 17.1$, $SD = 4.3$; out of 20 sessions). Partner attendance was calculated on the 37 families (75.5%) from which a partner came to at least one session.

Thus, as often found in real world settings, the average attendance for the program was somewhat lower compared to the efficacy study.

Comparison of study completion

Of the 36 families who initiated treatment in the Danish study, three dropped out after one or two sessions (8.3%). Their reasons for dropping out were (a) stressful family situation making it difficult to attend, (b) illness in the family, or (c) being a single parent/mother of several children. In the remaining 33 families (91.7%), at least one partner completed more than two sessions. As such they were included in pretest to posttest analyses. Analyses based on follow-up data were conducted on 28 families (77.8%) who provided partial data. In the efficacy study, two families (4%) dropped out of the program. Pretest to posttest analyses were conducted on 48 of 49 families (98%). Analyses at follow-up were conducted on 42 families (85.7%) in the efficacy study.

The higher percentage of families who dropped from the Danish study calls for some caution and will be discussed.

Comparison of treatment effects

Among Danish families receiving more than two session of IYPT, paired comparisons (two-tailed) revealed a significant pretest to posttreatment reduction in child behavior symptoms as measured by the Eyberg Intensity Scale, $t(32) = 7.68$, $p < 0.001$, Eyberg Problem Scale, $t(32) = 6.72$, $p < 0.001$, Conners 3AI ADHD symptoms, $t(32) = 5.08$, $p < 0.001$, and Conners 3AI ADHD impact, $t(32) = 5.08$, $p < 0.001$. Also significant pretest to posttest treatment improvement was found on both Social Competence measures; emotion regulation, $t(32) = -3.87$,

Table 2. Comparison of immediate outcome on mother reported child and parenting behavior

Variable	Danish study			Webster-Stratton <i>et al.</i> (2011) (efficacy study)						Effect size difference Z (p)	
	Intervention		d	Intervention			Waitlist				
	Pre M (SD)	Post M (SD)		Pre M (SD)	Post M (SD)	d	Pre M (SD)	Post M (SD)	d		
Eyberg											
Intensity	156.1 (19.1)	130.9 (19.8)	-1.3	155.7 (20.8)	125.8 (27.0)	-1.3	155.9 (20.8)	150.3 (26.3)	-0.2	-0.41 (ns)	
Problem	19.3 (6.0)	11.1 (5.4)	-1.4	22.5 (6.2)	13.7 (6.9)	-1.3	20.5 (6.2)	19.7 (6.9)	-0.1	-0.17 (ns)	
Conners											
Symptom	23.5 (4.5)	19.8 (5.2)	-0.8	21.5 (5.7)	16.6 (6.5)	-0.8	20.6 (5.7)	20.9 (5.7)	0.1	-0.18 (ns)	
Impact	4.8 (1.0)	3.7 (1.2)	-1.0	-	-	-	-	-	-	-	
P-comp											
Emotion regulation	1.1 (0.6)	1.5 (0.6)	0.7	1.9 (0.5)	2.5 (0.6)	1.1	1.9 (0.4)	1.9 (0.5)	0.0	2.10 (0.036)	
Social competence	1.5 (0.6)	1.9 (0.7)	0.6	2.7 (0.6)	2.9 (0.7)	0.3	2.6 (0.6)	2.7 (0.7)	0.2	-1.21 (ns)	
PPI											
Appropriate discipline	3.5 (0.8)	3.6 (0.2)	0.2	4.7 (0.9)	5.0 (0.9)	0.3	4.6 (0.8)	4.6 (0.9)	0.00	0.89 (ns)	
Harsh discipline	3.3 (0.7)	2.7 (0.5)	-1.0	2.9 (0.7)	2.4 (0.5)	-0.8	2.9 (0.8)	2.8 (0.7)	-0.1	0.66 (ns)	
Physical discipline	1.6 (.46)	1.3 (.29)	-0.8	1.5 (0.7)	1.2 (0.3)	-0.6	1.3 (0.4)	1.3 (0.4)	0.0	0.88 (ns)	
Praise	3.7 (.43)	4.4 (.52)	1.5	4.4 (0.8)	5.0 (0.9)	0.7	4.3 (0.8)	4.6 (0.8)	0.4	-2.76 (0.006)	

Notes: All entries are expressed as mean (M) and standard deviation (SD) of raw scores. *d* = Cohen's *d* (Cohen, 1988). Effect size difference regards intervention conditions only. Eyberg = Eyberg Child Behavior Inventory (Eyberg & Pincus, 1999); Conners = Conners 3AI (Conners, 2009); P-comp = Social Competence Scale (Conduct Problems Prevention Research Group, 1999a, 1999b); PPI = Parenting Practices Inventory (Conduct Problems Prevention Research Group, 1996).

$p = 0.001$ (two-tailed), and social competence $t(32) = -4.25$, $p < 0.001$ (two-tailed). Three out of four measures on the Parenting Practices Inventory improved significantly. Praise and incentives increased $t(32) = -5.14$, $p < 0.001$ (two-tailed), physical discipline was reduced $t(32) = 5.19$, $p < 0.001$ (two-tailed), and harsh discipline was reduced $t(32) = 6.56$, $p < 0.001$ (two-tailed). No significant change was found with regard to appropriate discipline $t(32) = -0.39$, $p = 0.70$ (two-tailed). Table 2 shows the means, standard deviations, and effect sizes of pretest to posttest changes compared to the efficacy study.

In assessing whether effect sizes were significantly different from each other under the two different intervention conditions we used a two-tailed test. Effect sizes were of a comparable magnitude (no significant difference between effects sizes) on seven of the nine benchmarks. Significant difference between effect sizes were found with regard to pretest to posttest mean change in emotion regulation skills, with larger effects on this measure among children in the efficacy study ($d = 1.1$) compared to children in the Danish study ($d = 0.7$), $Z = 2.10$, $p = 0.036$. On the contrary, parents in the Danish study experienced a significantly larger treatment effect ($d = 1.5$) on pretest to posttest mean change in praise and incentives compared to parents in the efficacy study ($d = 0.7$), $Z = 2.76$, $p = 0.006$.

MAINTENANCE AND OVERALL EFFECTS

Three outcome measures were included to examine maintenance and overall effect over time (see Table 3). In the Danish study, Eyberg Problem Scale scores decreased further from posttest to follow-up, $t(27) = 2.37$, $p = 0.025$, whereas no significant

change from posttest to follow-up was found on Eyberg Intensity Scale scores $t(27) = 1.24$, $p = 0.226$ and Conners 3AI ADHD symptom $t(27) = 0.65$, $p = 0.52$.

In Table 3, data on maintenance and overall effect is presented from both the Danish study and the efficacy study, though not compared due to the longer follow-up period in the efficacy study.

Clinical significance in the Danish study

On the Eyberg Intensity and Problem Scales, 93.5% of the Danish sample had an intensity score above cut-off (T score ≥ 60) at pretest and 77.4% had a problem score above clinical cut-off (T score ≥ 60) at pretest. The percentage of children who moved from above to below the clinical cut-off was 51.6% with regard to intensity scores and 35.4% with regard to problem scores. At follow-up, the percentage of children with clinically significant change had increased to 42.8% (intensity score) and 46.4% (problem score) placing a total of 50.0% (intensity score) and 67.8% (problem score) of the Danish children below cut-off at follow-up (see Table 3).

Using the 95 percentile as a clinical cut-off we calculated similar estimates of clinical significant change on the Conners 3AI scale. From pretest to posttest 26% of children moved from above to below this ADHD cut-off. From pretest to follow-up assessment 43% moved from above to below cut-off. Results with regard to reliable change are shown in Table 3. Children with change scores above the calculated RCI was 39% with regard ADHD symptoms and 60.7% (intensity score) and 57.1% (problem score) on the Eyberg scales. In Table 3, results regard-

Table 3. Posttreatment maintenance and clinical significance at follow-up.

Variable	Danish study N = 28					Webster-Stratton <i>et al.</i> (2012) N = 42						
	Pre M (SD)	Post M (SD)	FU M (SD) ^a	Post FU d	Pre FU d	% below cut-off (% RCI)	Pre M (SD)	Post M (SD)	FU M (SD) ^b	Post FU d	Pre -FU d	% below cut-off (% RCI)
Eyberg Intensity Problem	156.7 (19.5)	131.3 (21.0)	126.9 (26.1)	-0.2	-1.6	50.0 (60.7)	159.1 (23.0)	128.8 (25.6)	131.8 (29.7)	0.1	-1.0	44.2 (68.1)
Conners'-10 Symptom Impact	19.5 (5.5)	13.3 (6.6)	10.9 (5.4)	-0.4	-1.6	67.8 (57.1)	23.2 (5.9)	14.4 (7.1)	14.7 (8.9)	0.0	-1.1	51.2 (74.5)
	23.3 (4.6)	20.3 (5.4)	19.6 (5.7)	-0.1	-0.7	60.7 (39.0)	21.8 (5.50)	17.1 (6.4)	18.0 (6.1)	0.2	-0.7	-
	4.9 (1.1)	3.8 (1.2)	3.7 (1.3)	-0.2	-1.0	-	-	-	-	-	-	-

Notes: Eyberg = Eyberg Child Behavior Inventory (Eyberg & Pincus, 1999); Conners = Conners 3AI (Conners, 2009). Clinical cut-off T-scores were 60 for Eyberg intensity and 60 for Eyberg problems. d: Cohen's d (Cohen, 1988). RCI: Reliable Change Index (Jacobson & Truax, 1991). All entries are expressed as mean (M) and standard deviation (SD) of raw scores. ^a Follow up after 6 months. ^b Follow up after 12 months.

ing clinical significance is presented separately for the Danish study and the efficacy study.

Other treatment services

At intake, three of the Danish children (9%) were taking stimulant medication for ADHD and continued to do so during the treatment; two (6%) were prescribed stimulants during the treatment; and a total of nine children (27%) were taking stimulants at the follow-up assessment.

In the efficacy study no children were taking stimulant medication at intake, five children (8%) were medicated during the intervention and 14 (29%) were taking stimulants at follow up.

Since a higher percentage of children in the efficacy study compared to the Danish study changed in medication during treatment, this factor should act in favor of the efficacy study.

DISCUSSION

This study investigated the effectiveness of the IYPT, when offered without the child adjunct program to self-referred Danish parents with young children with ADHD symptoms. The findings were statistically and clinically significant reductions from pretest to posttest with regard to the children's ADHD symptoms and disruptive behavior. We also found a significant improvement of the children's social and emotion regulation skills. Parents furthermore reported using more incentives and praise as well as less negativity. All effects were maintained or improved at 6 months follow-up. Out of nine outcome measures, similar to those used by Webster-Stratton *et al.* (2011, 2012), eight showed comparable or higher magnitude of effect from pretest to posttest.

Two important differences appeared from the benchmark comparison. First, children in the efficacy study experienced a significantly larger treatment effect size on pretest to posttest mean change of emotion regulation skills compared to children in the Danish study. This effect may be related to the fact that the Danish children were offered childcare as opposed to treatment groups. Previous studies comparing parent training with child training plus parent training showed that the child program added to the impact on the child's peer relationship and problem solving skills (Webster-Stratton & Hammond, 1997; Webster-Stratton, Reid & Hammond, 2004). Thus, it is likely that child treatment groups in the efficacy study have effects on child emotion regulation skills that are not obtained through the child care in the Danish study. We cannot, however, rule out, that offering child care may have enhanced the overall outcome of the Danish intervention in indirect ways by encouraging the presence of all family members in the clinic and thereby increasing the overall amount of contact between family and staff. Future studies distinguishing effects of parent training from direct and indirect effects of child groups may provide a clearer answer to this finding. Second, parents in the Danish study experienced a significantly larger treatment effect on pretest to posttest mean change of praise and incentives compared to parents in the efficacy study. Since a popular pedagogical trend in Denmark advises against the use of direct praise in child rearing (Juul, 1999), the program component *praise* may introduce a more radical change in parenting practice in a Danish setting. This culture-specific negative attitude towards praise may

not benefit children with or at risk of ADHD, and if so, parents may have much to gain from changing this practice. In support of this interpretation, the Danish parents rated *praise* as the most efficient among program components.

One obvious limitation in the Danish study is the absence of a control group. This leaves open the possibility that study factors other than the intervention (e.g., the passing of time, attending to problems, or being observed) caused the effect. Using a benchmarking strategy allows us, albeit with caution, to conclude that this was most likely not the case. Parents and children in the control condition in the efficacy study (similar in characteristics and undergoing similar procedure) showed no significant change on any of the included measures over time (shown in Table 2). This speaks to the effect of the intervention and to the validity of the Danish results. It is important to mention that three families dropped out of the Danish study (8.3%) whereas only one family dropped out of the efficacy study (4%). We have no data indicating that the Danish families who dropped out constituted more complex cases, yet this cannot be ruled out.

A second limitation is the sole use of parental self-report measures. A diagnosis of ADHD, by definition, presupposes that symptoms are evident in both home and school environment. Furthermore, referrals often arise from behavioral reports from the school or preschool. Although data in the efficacy study suggested a high correspondence between teachers' and parents' report on symptoms measures, as well as between observational and self-report measures, future work including teachers' observations – is important to strengthen conclusions from this preliminary report.

From a research perspective, the lack of a thorough diagnostic assessment of ADHD as an inclusion criterion for the study is a limitation. However, the time demand involved in the diagnostic procedures was in direct opposition to the aim of the clinic being immediate and easily accessible support to families of young children with ADHD symptoms. The obtained baselines measures of symptoms indicate that the large majority of the sample had a very high likelihood of receiving an ADHD diagnosis if evaluated. Thus, from a practitioner and policy maker perspective, the current study speaks to the potentials of reaching the intended target group of young children with ADHD symptoms early, and the benefit of admitting families to treatment without allocating high amounts of resources to prior formal diagnostic assessment.

Overall, it speaks to the general strength of the Danish results that they were highly concordant with results from the efficacy study in spite of the differences in study conditions. It is important to note that several factors may have been against the odds of positive results within the Danish study; for example there were no child treatment groups, there were more complex cases (more single parents), and there was a lower attendance from both primary parents and partners. However, the treatment effects were found to generalize across conditions that could in fact obstruct the ability to find one. This speaks to the strength of effectiveness of the parenting program.

In conclusion, the current study suggests that the IYPT can be successfully implemented in a Danish early intervention setting to which parents with children showing ADHD symptoms can self-refer. This adds to previous Scandinavian studies (targeting

young children with ODD/CD) that also supported the transferability of IYPT into Norwegian (Larsson, Fossum, Clifford, Drugli, Handegård & Mørch, 2009) and Swedish (Axberg & Broberg, 2012) clinical settings. Furthermore, with the use of a benchmarking approach, this study can serve to demonstrate an alternative method for assessing effectiveness, when new versions of US protocols are implemented in a Scandinavian real-life setting. Although studies of this type cannot replace controlled trials, the method is rigorous and feasible and can provide valuable information on how IYPT transports across different delivery settings and populations. The Danish study found a remarkable similarity between the symptom levels in the diagnosed population in the efficacy study and in the Danish self-selected group of parents, as well as a high similarity between effects in the efficacy study and effects in the Danish study. Thus, the findings are generally in favor of offering IYPT as a more accessible service for parents to young children with, or at risk of, ADHD.

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