

Incredible Years parent training: What changes, for whom, how, for how long?

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Abstract

The aims of this study were to examine the efficacy of the Incredible Years program (IY) with Portuguese families of preschoolers, moderator and mediator effects, and sustainability of results. Design: randomized controlled design with pre- and post-intervention, 12 and 18 months assessments. Participants: 124 children aged 3-6 years, at risk of disruptive behavior problems. Children in the IY group showed significant reduction in behavior problems and increase in social skills; caregivers improved parenting practices and self-confidence. Positive clinical and functional impacts were demonstrated. IY was efficacious with a wide range of families. The moderating effect of the child's age suggests that IY prevents a decrease in social skills for the ages covered by this study. Changes in parental self-efficacy affected changes in parental practices, promoting changes in children's behavior. Positive effects were maintained over time.

Keywords: parenting; preschoolers; disruptive behavior; trial (randomized); mediator; moderator.

Incredible Years parent training: What changes, for whom, how, for how long?**Introduction**

Behaviors such as hyperactivity, aggression and noncompliance are frequently displayed by preschoolers and may be considered normal for this age. However, a smaller percentage of children manifest these behaviors with such intensity that they become disruptive to family life and school routines, to the point of jeopardizing the child's relationships with peers and adults. The increasing numbers of young children referred to specialized intervention for behavior problems in recent years is widely recognized by clinicians, and this may only be the visible part of the iceberg, with many children who exhibit disruptive behaviors remaining unidentified and untreated (Lavigne, LeBailly, Hopkins, Gouze, & Binns, 2009). Although many of these children will subsequently follow normal developmental trajectories, some will continue to have difficulties in middle childhood (Campbell, Shaw, & Gilliom, 2000), and other problems may arise in the mid- and long-term, such as social rejection, school failure, substance abuse and juvenile delinquency (Patterson, 2002; Scott, Spender, Doolan, Jacobs, & Aspland, 2001).

Whether a child will follow a pathway that is more or less adaptive may be determined not only by the extent of their behavioral difficulties, but also by their parents' ability to adjust their parenting style to their children's needs and temperament (Sonuga-Barke, Auerbach, Campbell, Daley, & Thompson, 2005) and guide them through the multiple stressful situations triggered by the maladaptive behavior (see Chess and Thomas' concept of *goodness of fit*, 1999). As children under six years of age are very dependent on their caregivers, their behavior is highly moderated by the characteristics of the caregiving environment, and any change in the child will necessarily be preceded by changes in their environment. Therefore, it is not surprising that psychosocial interventions are

recommended as first-line interventions for these early disruptive behavior problems (AAP, 2011; Comer, Chow, Chan, Cooper-Vince, & Wilson, 2013). The purpose of the present study was to analyze the impact of a parent training (PT) program on early disruptive behavior in Portuguese preschoolers.

PT programs aimed at enhancing parenting skills and behavior management strategies have been shown to be effective in reducing children's disruptive behavior (Almeida et al., 2012; Kaminski, Valle, Filene, & Boyle, 2008; Lee, Niew, Yang, Chen, & Lin, 2012; Lundahl, Risser, & Lovejoy, 2006; NICE, 2008, 2013; Roskam & Meunier, 2012), in both prevention and treatment studies. Furthermore, the likelihood of success was enhanced if these interventions were implemented early in the child's life (Campbell, et al., 2000; Sonuga-Barke et al., 2013). The change in parenting practices, from harsh and coercive to positive and respecting, has a mediating effect on children's behaviors when parents participate in such programs (Gardner, Hutchings, Bywater, & Whitaker, 2010; Posthumus, Raaijmakers, Maassen, Engeland, & Matthys, 2011), by interrupting the coercive cycle that otherwise becomes established in parent-child interactions (Patterson, 2002). The role of parents' self-efficacy beliefs as important contributors to this change has also been demonstrated, with stronger parental self-efficacy beliefs being related to increases in supportive parenting behavior and decreases in controlling parenting behavior (Roskam & Meunier, 2012). However, despite the recognition accorded to parental training in changing children disruptive behavior, the number of robust studies identifying mechanisms of change that explain why treatments work is limited and can still be viewed as a challenge for the future (Kazdin, 2008; Weisz & Kazdin, 2010).

The Incredible Years Basic Parent Training (IYPT, Webster-Stratton, 2001) is a widely researched well-established program that has proved its effectiveness in changing

parenting practices and child behavior, particularly in children with early disruptive behavior problems (Menting, de Castro, & Matthys, 2013). The program's efficacy has been demonstrated in numerous studies by the program developer and her team in the USA (see Webster-Stratton, Gaspar, & Seabra-Santos, 2012, for a review), and replicated in independent research centers, in both treatment (Larsson et al., 2008; Taylor, Schmidt, Pepler, & Hodgins, 1998), and prevention trials (Posthumus, et al., 2011; Trillingsgaard, Trillingsgaard, & Webster-Stratton, 2014) in numerous countries, such as England (Gardner, Burton, & Klimes, 2006; Scott et al., 2001), Denmark (Trillingsgaard et al., 2014), Holland (Leijten, Raaijmakers, de Castro, van den Ban, & Matthys, 2015; Posthumus et al., 2011), and New Zealand (Sturrock & Gray, 2013). The effects of treatment have been shown to be durable over time (Posthumus et al., 2011; Scott, Briskman, & O'Connor, 2014), and a meta-analysis assessing the effectiveness of IYPT (Menting et al. 2013) concluded that the program was an effective intervention for reducing disruptive behavior and increasing pro-social behavior in children from a diverse range of families.

There have also been a few studies that investigated the change mechanisms underlying IYPT effects. Fossum, Mørch, Handegard, Drugli, and Larsson (2009) found that high levels of maternal stress, clinical levels of ADHD in children, and female sex predicted less improvement in conduct problems at home after IYPT. Gardner et al. (2010), on the other hand, showed that IYPT tended to produce better outcomes for younger children and for boys with conduct problems (while girls generally improved irrespective of intervention allocation), and for children with more depressed mothers. In the same study, no predictive effects were observed for other risk factors, such as single or teen parenthood, very low income or high initial levels of problem behavior. A previous study (Beauchaine,

Webster-Stratton, & Reid, 2005) demonstrated that moderators such as poor marital adjustment, paternal substance abuse, child comorbid anxiety/depression, and maternal depression were related to greater response to IYPT, while the child's age and sex did not show any effect. Baydar, Reid, and Webster-Stratton (2003) also demonstrated that mothers who were depressed or had a previous history of abuse or substance use, were just as likely to benefit from IYPT as mothers without such risk factors. In the above mentioned meta-analysis, Menting et al. (2013) found that family characteristics such as ethnic minority status or single parenthood were not related to the intervention effects. This was in contrast to the initial severity of problems, which were the strongest predictor of IYPT intervention effects, with larger effects observed in studies comprising more severe cases.

Although not conclusive, these results suggest that the most disadvantaged families benefited from this intervention at least as much as more advantaged ones. As far as mediator variables are concerned, changes in positive parenting skills (Gardner et al., 2006; Gardner et al., 2010) and a decrease in observed critical, harsh and ineffective parenting (Beauchaine et al., 2005; Fossum et al., 2009; Posthumus et al., 2011) appeared to be key variables for change in child conduct problems.

In Portugal, dissemination of the IYPT started in 2003 (Webster-Stratton et al., 2012). Results from an initial pilot study (Cabral et al., 2009) showed that after a IYPT training, extremely socially-disadvantaged parents were more empathic and able to address their children's needs, and showed less stress in the exercise of their parental role. In addition, results from a subsample of the study presented in this paper, with children at risk for ADHD, demonstrated reductions in children's hyperactive behaviors and improvements in their mothers parenting practices (Azevedo, Seabra-Santos, Gaspar, & Homem, 2013, 2014). Family relationships of a subsample of children with oppositional-defiant disorder

symptoms were also analyzed showing decreases in fathers' negative parenting practices, increases in positive parenting, and some changes in the couple's relationships (Homem, Gaspar, Seabra-Santos, Azevedo, & Canavarro, 2015; Homem, Gaspar, Seabra-Santos, Canavarro, & Azevedo, 2014). This paper extended previous work, including the larger and more heterogeneous sample, and also explored mediator and moderator effects.

This study aimed to answer three questions: *Question 1*) Is the program efficacious with Portuguese families of preschoolers with disruptive behavior? This question addresses an important issue concerning transportability (Schoenwald & Hoagwood, 2001): the fact that an intervention has been effective for a particular population or in a certain cultural and linguistic context (as was the case with IYPT in several different countries) does not necessarily mean that it will be equally effective in a different one (Weisz, Sandler, Durlak, & Anton, 2005). On the other hand, it is likely that IYPT is able to be successfully transported to the Portuguese context if the same clinical outcomes and levels of participant engagement found in different cultural contexts are also found in this study, provided that the intervention is administered with fidelity and at the optimal dose (Lau, 2006). *Question 2*) If efficacious, for whom and how does the program work? Drawing on prior literature, the moderator effects of child-related variables (sex, age, comorbidity and intensity of initial deviant behavior), and family-related variables (maternal depressive symptoms and socioeconomic status) were analyzed. Parenting practices and parents' sense of self-efficacy concerning parenting were explored as possible mediators of change in child behavior. *Question 3*) If program efficacy is demonstrated, are the results sustained over time? In line with other studies (Lee et al., 2012; Posthumus et al., 2011), we hypothesized that results would be maintained 12 and 18 months after baseline.

Method

Design

The study used an experimental randomized controlled between-group design, with pre- and post-intervention, 12 and 18 months assessments (follow-up 1 – FU1 – and follow-up 2 – FU2), four data collection points in total. After baseline assessment, children were stratified by age and sex, and randomly allocated to an Incredible Years intervention group (IY; $n = 68$) or to a Waiting-List Control group (WLC; $n = 56$) (see flow chart in Fig. 1). Team members who had not participated in the baseline assessment and were unaware of the characteristics of the children and families were responsible for randomly allocating participants using sequentially numbered containers. At the beginning of the trial participants were allocated on a 2:1 basis, so that more families could receive the intervention and fewer would have to wait for it (Jones, Daley, Hutchings, Bywater, & Eames, 2007). However, after initiating the randomization procedure, it became clear that a more efficient method was needed in order to assure that the control group would have the required number of participants to achieve the necessary power. As a result, a 1:1 ratio was adopted, ensuring the adequate number of participants in the control group while maintaining the randomization procedure. All data were collected in the laboratory by research assistants who were kept blind to the participants' allocation condition, as parents were asked not to reveal whether they had or had not attended a group. For ethical reasons, families assigned to the WLC group were invited to participate in an IY group after the post-intervention assessment and were no longer assessed thereafter.

[Insert **FIGURE 1** about here]

Participants

One hundred twenty-four three- to six-year-old children and their families participated in this study. All the children were identified as being at risk for disruptive

behavior based on caregivers' ratings. This was defined as above the 80th percentile on at least one of the following two scales of the Strengths and Difficulties Questionnaire (SDQ, Abreu-Lima et al., 2010; Goodman, 1997): the Hyperactivity Scale (HY) or the Conduct Scale (CP). Nineteen percent of children met only the first criterion (HY), while 30% met only the second one (CP), and 51% were above the cut-off point on both subscales (comorbidity). For inclusion in the trial caregiver agreed to participate in an IYPT group. Children were excluded from the study if they had a formal diagnosis of neurological or developmental disorder, severe developmental delay, or if they were undergoing any pharmacological or psychotherapeutic intervention.

The average age of the children was 55.86 months ($SD = 11.20$), and 73% of them were male. Almost all of the main caregivers (from now on referred to as "mothers") were mothers (98%), who were mostly married or living as married (80%), with a mean age of 35.35 ($SD = 5.50$). The sample also included two grandmothers and one father. Forty-four percent of the families had medium socioeconomic status (SES), as estimated by the parents' occupation and years of education, and almost half of the mothers (48%) had a university degree.

Procedures

This study was authorized by the Portuguese Data Protection Authority (No.1253/2011) and by the Medical Ethical Committee for clinically referred children. Some children were clinically referred by pediatricians, child psychiatrists or psychologists ($n = 64$), while others were self-referred by parents ($n = 50$) or screened in preschool settings ($n = 10$). The parent report SDQ subscales (HY and CP) were used for screening children for inclusion, and those who scored as at risk for disruptive behaviors were considered eligible for the study (cf. inclusion criteria), even in the absence of a formal

diagnosis. Children and families were then formally evaluated using a multi-method and multi-informant procedure (baseline assessment) that included parent reports of the child's behavior and parent self-report measures, and a laboratory-based mother-child interaction observation.

Assessment

The assessment protocol used in this study is described in detail at <http://www.fpce.uc.pt/anosincriveis/protocolo.doc>. This site also includes details of previous studies with the selected measures in Portuguese samples.

An initial semi-structured interview was carried out to obtain demographic data and recollect developmental milestones and medical history. Stressful life events were evaluated using the *Stressful Life Events* subscale of the *Parenting Stress Index* (PSI; Abidin, 1983; Abidin & Santos 2003). This is an optional checklist of 24 life events that are likely to cause stress (e.g., unemployment, divorce, death of a relative). Although external to the parent-child relationship, these events are viewed as potential exacerbators of stress in parenting (Abidin & Santos, 2003). The respondent has to indicate whether each of the events has been experienced in his/her close family during the past 12 months. Life events are scored from a minimum of 2 (e.g., for “reconciliation of the couple”) to a maximum of 8 (e.g., for “psychiatric condition”), according to the amount of stress they are likely to cause. The total score, used in this study as a baseline measure, is the sum of all items and ranges from 0 to 114.

Measures of child behavior.

The *Strengths and Difficulties Questionnaire* (SDQ, Goodman, 1997; Portuguese version by Fleitlich, Loureiro, Fonseca, & Gaspar, 2005) was used as the screening instrument in this study. This is a 25-item inventory designed as a brief behavioral

screening measure to assess the occurrence of behaviors that have been associated with conduct problems (CP), hyperactivity (HY), emotional symptoms, peer problems and pro-social behavior in children aged 2-16. CP and HY results were analyzed as outcome variables as well as used as moderators in moderation analyses (comorbidity and intensity of symptoms at baseline). Respondents (parents or teachers) provide answers reporting on the child's behavior over the last six months. The SDQ also includes an Impact Supplement, used in this study as an outcome measure, with questions addressing the burden caused by the difficulties in different domains (at home, with friends, at school, during playtime). The SDQ has been included in a number of similar studies (e.g., Hutchings, Bywater, Daley, et al., 2007). It showed good psychometric properties with English (Goodman, 2001) and acceptable psychometric properties with Portuguese samples (e.g., $\alpha = .60$ for HY and $\alpha = .59$ for CP Scale in Abreu-Lima et al., 2010). In this study the internal consistency for the parent version was .66, .46 and .77, for the HY Scale, the CP Scale, and the Impact Supplement, respectively.

Preschool and Kindergarten Behavior Scales – Second Edition (PKBS-2, Merrell, 2002). This is an 80-item behavior rating scale designed to measure social skills and problem behaviors of children between three and six years old. This instrument may be completed by parents, teachers or other caregivers and comprises two separate scales: a 34-item Social Skills Scale (PKBS-SS) and a 46-item Problem Behaviors Scale, which scores on two subscales – Externalizing (PKBS-Ext) and Internalizing Problems (PKBS-Int). Responses are based on the occurrence of behaviors during the past three months. In this study, only parents' results of the PKBS-SS ($\alpha = .88$) and the PKBS-Ext ($\alpha = .90$) were analyzed (primary measures of children outcomes given the psychometric robustness of this instrument). The teachers' results will be reported elsewhere, and were used in this

paper only to characterize the sample concerning the presence of behavior problems at school, at baseline (Cronbach alpha coefficient for the PKBS-Ext answered by teachers = .97).

Measures of psychopathological symptoms, parenting skill and parenting confidence.

Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961; Vaz-Serra & Abreu, 1973). This is a 21-item self-report inventory measuring the severity of symptoms associated with depression. For each item, respondents select from four categories (0 = symptom is not present, to 3 = symptom is severe). The total BDI score, used in this study as a baseline measure and as a moderator in the moderator analyses, is the sum of all items and ranges from 0 to 63. Results showed an internal consistency of .90.

The *Brief Symptom Inventory* (BSI; Canavarro, 2007; Derogatis, 1993) was used to assess psychopathology in mothers. This is a 53 item self-report inventory, covering nine dimensions (e.g., somatization, depression, anxiety). Subjects evaluate the frequency to which they experienced specific symptoms during the past week on a Likert scale ranging from 0 (“not at all”) to 4 (“extremely”). Internal consistency in this sample was high ($\alpha = .97$). For purposes of the present study the Positive Symptom Distress Index was calculated and used as a baseline measure, representing the average intensity of the symptoms marked as present (above zero). This index has been considered the best summary indicator of psychopathology and a threshold of 1.7 was taken into account as an indicator of risk (Canavarro, 2007).

The Parenting Scale (PS; Arnold, O’Leary, Wolff, & Acker, 1993). This is a 30-item inventory designed to measure dysfunctional discipline practices. A higher score represents

greater use of negative parenting practices. It was used in this study as an outcome measure as well as in the mediation analyses. Factor analytic studies with Portuguese samples (cf. <http://www.fpce.uc.pt/anosincriveis/protocolo.doc>) revealed poor replicability of the original three factor structure (that traditionally supports three subscales), which justified the use of a single total score in the present study, with a Cronbach alpha of .74.

Parenting Sense of Competence scale (PSOC; Johnston & Mash 1989 following Guibaud-Wallston & Wandersman initial works). This scale, used in the present study as an outcome measure and in the mediation analyses, assesses parental perceptions of their competence as parents of children aged from four to nine years regarding two dimensions: Satisfaction and Efficacy. Higher scores indicate higher levels of confidence in parenting capacities. The levels of internal consistency reported for this sample were .76 and .79 for the Satisfaction and Efficacy subscales respectively.

Parent-child interaction behaviors – observation measure.

Mothers and children were observed for 25 minutes in a laboratory free-play session with a fixed set of toys, using the *Dyadic Parent-Child Interaction Coding System* (DPICS; Robinson & Eyberg, 1981) to assess the quality of parent-child interaction. This measure records categories covering parent and child behaviors, coded as present or absent during each 5-minute time segment. The DPICS has been shown to be sensitive to the effects of treatment (Jones et al., 2007; Posthumus et al., 2011). In line with other studies (Hutchings, Bywater, Daley, 2007; Webster-Stratton, Reid, & Beauchaine, 2011) child and parent variables were used as outcome measures. Child variables were: Child Pro-Social Behavior (verbal and non-verbal positive affect, and physical warmth); and Child Deviance and Non-Compliance (cry-whine-yelling, physical negativity, smart talk, destructiveness, and non-compliance). Parent variables were: Positive Parenting (labeled and unlabeled praise,

positive affect, physically positive behavior, and problem-solving); and Critical Parenting (critical statements and negative commands). The interactions were videotaped and coded by a trained rater who was blind to allocation. Approximately 20% of all recorded interactions were coded by a second rater, and a mean of 76% inter-rater agreement was achieved. In the present sample intra-class correlations for the variables analyzed equaled: .53 for Child Pro-Social Behavior; .92 for Child Deviance and Non-Compliance; .97 for Positive Parenting; and .91 for Critical Parenting.

Consumer satisfaction.

After the 14-session IYPT program, parents rated their satisfaction with the program's different components using a detailed questionnaire (Webster-Stratton, 2001). Ratings use a 7-point scale, on which higher scores mean higher levels of satisfaction. In this paper we analyzed responses to some key questions: feelings about child's progress ("Very dissatisfied" to "Greatly satisfied"), feelings about appropriateness of the approach used to enhance child's behavior ("Very inappropriate" to "Greatly appropriate"), whether the participant would recommend the program to a friend or relative ("Strongly not recommend" to "Strongly recommend"), usefulness of the teaching methods and of the specific parenting techniques trained ("Extremely useless" to "Extremely useful").

Intervention

The fourteen-session Incredible Years Basic Parent Training Program (IYPT; Webster-Stratton, 2001) was used as the intervention. This program mainly aims to promote mental health in young children by training parents to use positive parenting strategies, including playing with children, praising and rewarding, setting limits effectively, handling misbehavior in respectful ways, and strengthening parent-child relationships. In the IYPT program, a strong emphasis is put on a collaborative approach,

involving active learning methods, such as role-play, video modeling, homework assignments and group discussion directed to the identification of social learning principles. Groups of 8 to 12 parents met weekly for two hours, for over 14 weeks. Sessions were run in the evening by two trained facilitators, in a university community facility (9 groups) or in a mental health center (2 groups). Childcare and snacks were provided to increase the likelihood of parents attending the sessions. Both mothers and fathers were strongly encouraged to attend the program and in 43% of the families both parents actually participated, although only the primary caretaker's outcomes are analyzed in this paper. In line with other studies (Lees & Ronan, 2008; Posthumus et al., 2011) two booster sessions were carried out, one after post-assessment (9 months after baseline) and the second after FU1 (15 months after baseline). Although these sessions are not formally a part of the program, they have been considered desirable from a clinical and ethical point of view (Lee et al., 2012), and are strongly recommended by the program's developer as an opportunity to review the main content, solve new or resistant problems and enhance parents' support network.

In order to promote *treatment integrity*, all six facilitators who ran the intervention had attended the accredited 3-day IYPT workshop and were either certified group leaders ($n = 4$) or undergoing the certification process ($n = 2$) (a summary of the certification process can be found on the Incredible Years website, <http://incredibleyears.com>). They all had previous experience in child psychology or psychiatry. Sessions were videotaped for weekly self-review and regular peer supervision, and all group leaders received consultation from an IY-accredited trainer. Also, in order to support treatment integrity (Hutchings, Bywater, Daley, et al., 2007), the IYPT protocol was closely followed (e.g., standardized handouts were given to parents in all sessions, leader checklists were

completed for monitoring protocol adherence and peer and self-evaluation questionnaires were filled in for key sessions).

Data Analysis

Statistical analyses were performed using SPSS 20.0. Differences between groups at baseline were analyzed with chi-square and *t* tests for categorical and continuous variables, respectively, and Mann-Whitney tests were used to compare the attrition sub-samples to participants who completed the assessments (at post-intervention, FU1 and FU2). For all the dependent variables a per protocol analysis was conducted and General Linear Model (GLM) for repeated measures analysis of variance (ANOVAs) was used to study the effects of the interaction between condition (IY/WLC) and time (Pre-/Post-intervention), and the maintenance of the effects within the IY group (Post/FU1/FU2), followed by pairwise comparisons with Bonferroni adjustment. When required, the Greenhouse-Geisser sphericity correction was performed and reported for multivariate analyses. Effect sizes (ES) were calculated with partial eta square (η_p^2), and classified according to Cohen (1988): 0.01 for a small effect, 0.06 for a medium effect and 0.14 for a large effect size. The significance level used was .05. A priori sample size calculations revealed that for a power of .90, with $p < 0.05$, testing for interaction effects between two groups with repeated measures ANOVA (with two time measurements), a minimum of 84 participants in the total sample was required for detecting small to medium effects ($f = .15$). Regarding sample size calculations for repeated measures for the intervention group across the three time measurements, a priori sample size calculations revealed that for a power of .90, with $p < 0.05$, a minimum of 49 participants in the total sample was required for detecting small to medium effects ($f = .15$). The clinical significance of the change was analyzed according to two criteria: a reduction of at least 30% from baseline to subsequent assessments in PKBS-

Ext behaviors at home (Axberg, Hansson, & Broberg, 2007; Webster-Stratton, Hollinsworth, & Kolpacoff, 1989) and the percentage of children who moved from a moderate- or high-risk range to the normative range, from baseline to subsequent assessments (analyzed using the non-parametric McNemar change test).

Moderation and mediation analyses were performed using the SPSS Macro Process (Hayes, 2012). Moderation analyses were conducted using multiple regression procedures, including the independent and moderation variables and the multiplicative term (the interaction) in the regression. In all analyses the baseline score of the outcome variable (PBKS-Ext or PBKS-SS) was controlled by including it in the regression. Mediation analyses were conducted to examine the mechanism underlying change in child behavior (PBKS-Ext). Therefore, new variables were built based on the change in parental practices (PS total score), the parental sense of efficacy (PSOC – Efficacy subscale) and child externalizing behavior (PBKS-Ext) from Time 1 to Time 2 (score at T1 – score at T2). Regression analyses were conducted predicting change in child externalizing behavior (PBKS-Ext), with condition (intervention group = 0; waiting list group = 1) as the predictor and change in parental sense of efficacy and in parental practices as the mediator variables. The significance of the mediating effects was ascertained using bootstrap procedures with 5000 samples, following recent recommendations (Cheung, 2009; Hayes, 2009, 2012; MacKinnon & Fairchild, 2009; MacKinnon, Lockwood, & Williams, 2004; Shrout & Bolger, 2002).

Results

Sample Characteristics at Baseline

According to the mothers' ratings on the Preschool and Kindergarten Behavior Scale – 2nd Edition (Major, 2011; Merrell, 2002), 28% of the children were at moderate risk for

externalizing behavior problems and 46% were at high risk, while 29% were at moderate risk for poor social skills and 30% were at high risk. On the same measure, 55% of the children were rated by their preschool teachers as being at risk for externalizing behavior problems. Twenty-two percent of mothers self-reported depressive symptoms above the clinical cut-off on the Beck Depression Inventory (Beck et al., 1961; Vaz-Serra & Abreu, 1973) and 41% were above the cut-off on the Positive Symptom Distress Index of the Brief Symptom Inventory (Canavarro, 2007; Derogatis, 1993). Forty-one percent had experienced stressful life events above the 80th percentile according to the Parenting Stress Index (Abidin, 1983; Abidin & Santos, 2003). Preliminary analyses showed no significant differences between IY and WLC groups at baseline (see Table 1 for comparison).

[Insert **TABLE 1** about here]

Program Attendance Rate

In the IY condition, four mothers (6%) dropped out of the intervention. Including these mothers, a 78% IY attendance rate was achieved, with 59 mothers (87%) attending nine or more sessions (i.e., two thirds of the program), 62% at least 12 sessions, and 18% all program sessions ($M = 10.99$, $SD = 3.46$).

Study Attrition

Ninety-two percent of participants were retained at post-intervention assessment, six months after baseline (Figure 1). Although more families from the WLC ($n = 7$) were lost at post-intervention assessment compared to the IY ($n = 3$), the test value is not statistically significant, $\chi^2(1) = 1.73$, $p > .05$. When compared to retained mothers, those who were lost had had few years of schooling, $U = 760.50$, $p < .05$, had lower SES, $\chi^2(1) = 9.57$, $p < .01$, were non-married in a higher proportion, $\chi^2(1) = 4.02$, $p < .05$, and evaluated their children

as having higher social skills, $U = 343.00, p < .05$. Nevertheless, when these cases were excluded from the analyses, IY and WLC groups remained equivalent regarding the variables presented in Table 1. Eighty-four percent of mothers from the IY condition who initiated the trial returned the questionnaires at FU1, and 75% at FU2. No differences were found between IY mothers who completed FU1 evaluations ($n = 57$) and those who did not ($n = 11$). At FU2 one significant difference emerged: when compared to retained mothers ($n = 51$), the mothers who dropped out from the study ($n = 17$) reported higher levels of stress at baseline, $U = 377.00, p < .05$.

Post-intervention Effects

Sample sizes, means and standard deviations at baseline and post-intervention for IY and WLC groups are presented in Table 2, along with results of the repeated measures ANOVA and effect sizes.

[Insert **TABLE 2** about here]

Child behavior.

As shown in Table 2, repeated measures ANOVA revealed significant condition x time interaction effects on all of the reported child behavior measures. When compared to the WLC group, the IY group showed larger changes from pre- to post-intervention as reported by mothers, all in the expected direction: a decrease in behaviors related to hyperactivity and conduct problems (SDQ), a decrease in externalizing behaviors and an increase in social skills behaviors (PKBS-2). All of the effect sizes were medium, ranging from .057 (SDQ-CP) to .073 (PKBS-SS). The observation measure (DPICS) change was significantly larger in the IY group than in the WLC group for Child Pro-Social Behavior ($p < .05; \eta_p^2 = .045$), but not for Child Deviance ($p > .05; \eta_p^2 = .000$).

Parenting practices and sense of competence.

The decrease in self-reported negative parenting practices and the increase in mothers' perceptions of self-efficacy with parenting, between baseline and post-intervention, were significantly larger in the IY group than in the WLC group (Table 2). Effect sizes observed for these variables were medium ($\eta_p^2 = .064$ for Efficacy), to large ($\eta_p^2 = .192$ for the Parenting Scale). Condition x time effects were non-significant for the PSOC Satisfaction subscale. In the observation measure (DPICS), the change was significantly larger in the IY group than in the WLC group for Positive Parenting ($p < .05$; $\eta_p^2 = .210$), but not for Critical Parenting ($p > .05$; $\eta_p^2 = .023$).

Consumer satisfaction.

Parents reported high levels of satisfaction with their children's progress: 40% were "Satisfied", while 50% were "Greatly satisfied". They felt the approach used to enhance children's behavior was "Appropriate" (31%) or "Greatly appropriate" (67%). Three percent would "Recommend" the program to a friend or relative, while 97% would "Strongly recommend" it. Using the 7-point scale of the final satisfaction questionnaire, parents rated the usefulness of the teaching methods used in the IY sessions at 6.47 in average ($SD = 0.32$), while they rated the usefulness of the specific parenting techniques trained at 6.60 in average ($SD = 0.44$).

Analysis of Moderators and Mediators

Moderator analyses were performed to examine whether the program worked better for any specific sub-groups of participants. The outcome variables were child externalizing behavior (PBKS-Ext) and child social skills (PBKS-SS). Several variables were explored as moderators, namely child variables – age, sex, comorbidity (both HY and CP Scales of the SDQ above cut-off points), and symptom intensity at baseline assessment (SDQ scores); and family variables – maternal depressive symptoms (BDI), and socioeconomic

status. In all but one analyses the moderations were found to be non-significant (data not shown). Child age was a significant moderator of intervention effects in predicting behaviors that reflect social skills (PKBS-SS) ($R^2 = .36$, $F_{4,104} = 14.96$, $p < 0.001$; $\Delta R^2 = 0.03$, $\Delta F_{1,104} = 4.92$, $p < 0.05$). Using the Aiken and West (1991) recommendations for estimating power of interaction effects, with an R^2 of .36 and the R^2 increase of .03 for the interaction effect, this moderation analysis has the power to detect an effect above .80. Effects were significant at the ages of four ($p < 0.01$) and five ($p < 0.001$), but not at age three, and indicated that the program is efficacious in preventing decreased social skills in children at these ages. Results are displayed in Figure 2.

[Insert **FIGURE 2** about here]

The mechanism by which changes in child behavior occurred was tested by analysis of mediation. In this analysis, a regression model was performed with the condition (IY vs. WLC) as the predictor, changes in child behavior (PKBS-Ext and PKBS-SS) as the outcome and changes in parental practices (PS total score) as the intervening (Mediator) variable. The result was significant for PKBS-Ext (estimate: -1.87, Bootstrap Bias corrected 95% confidence interval: -3.93, -0.26), that is, the intervention group reported greater changes in parental practices which in turn promoted larger changes in child behavior (Figure 3).

[Insert **FIGURE 3** about here]

Another regression analysis was performed to test whether changes in parental practices were preceded by changes in parental sense of efficacy (cf. Figure 4). This analysis also revealed a significant result (estimate: -.20, Bootstrap Bias corrected confidence interval: -.83; -.02), showing that changes in parental perception of self-efficacy

in the intervention group affected changes in parental practices, therefore promoting changes in children behavior.

[Insert **FIGURE 4** about here]

Follow-up Outcomes

For all rating scale measures (both for children and mothers' measures), improvements reported at post-intervention assessment were maintained over time, as evidenced by non-significant differences revealed by repeated measures ANOVA (cf. Table 3) over the three assessment points (post-intervention, FU1, and FU2). In the observation measure (DPICS), the child results were maintained, but not the observed mothers' behavior. Positive Parenting behaviors showed a significant decrease over time ($p < .01$) (from post-intervention, $M = 29.84$, $SD = 12.11$, to FU2, $M = 21.58$, $SD = 10.74$), while Critical Parenting had a positive change, as it also showed a significant decrease over time (from post-intervention, $M = 13.77$, $SD = 9.44$, to FU2, $M = 10.00$, $SD = 7.57$, although only marginally significant in this case, $p = .059$).

[Insert **TABLE 3** about here]

Clinical Significance of Change and Impact of Difficulties at Post-intervention and Follow-ups

The results showed a clinically significant decrease in externalizing behavior problems for children whose parents attended the IY training, with 27% of these children (compared with 11% in the WLC condition, $\chi^2(1) = 3.02$, $p = .08$) having reduced their scores in the PKBS-Ext by at least 30%. Twenty-five percent of children in the IY group met this criterion at FU1 and 33% at FU2. Thirty percent of children in the IY group (and 18% in the WLC group) moved from the moderate or high-risk range to the low-risk range on the PKBS-Ext between pre- and post-intervention. McNemar's test determined that the

difference in the proportion of children out of the risk range between these two moments was statistically significant for the IY group ($p < .01$) but not for the WLC group ($p > .05$). The difference in the proportion of IY children out of the risk range remained statistically significant when FU1 and FU2 were compared with pre-intervention ($p < .01$), with 32% and 33% of children at FU1 and FU2, respectively, having moved from the moderate or high-risk range to the low-risk range.

The impact of difficulties in the child's and family life (as assessed by the SDQ Impact Supplement) decreased from pre- to post-treatment significantly more in the intervention than in the control group, $F(1, 76) = 8.26, p < .01, \eta_p^2 = 0.10$. This positive change was maintained at subsequent follow-ups, $F(2, 58) = 0.41, p > .05, \eta_p^2 = 0.03$.

Discussion

The first aim of this study was to test the transportability of the IYPT to Portuguese families of preschoolers at risk for disruptive behavior problems (*Question 1*). Overall, treatment outcomes showed a significant reduction in children's externalizing behavior and a parallel increase in their social skills and pro-social behavior, with moderate effects. We observed a reduction in negative parenting practices and an increase in positive parenting, with large effects, and in parental sense of self-efficacy, with a moderate effect. Kaminski et al. (2008) have highlighted, in their meta-analysis of components associated with the effectiveness of PT programs, that larger effects are found for programs that include enhancing positive interactions between parents and their children. Patterson (2002) has also emphasized the need to increase relative rates of reinforcement for pro-social behaviors in order to achieve rapid changes during intervention. Therefore, our encouraging outcomes may reflect the emphasis on positive parenting within the IYPT, where all the

behavior management strategies trained are built on strengthening the parent-child relationship, which is the main focus of the program.

Results are positive overall, although some of the outcomes varied depending on the type of measure. While the main effects were significant and of moderate magnitude in all the parental reports (except Parental Satisfaction), on the observation measure (DPICS) changes were significant only for positive behaviors, both of mothers (increased Positive Parenting), and children (increased Child Pro-Social), but not for negative behaviors/practices. This may raise issues about the ecological validity of observation measures (Sonuga-Barke et al., 2013), which in this case were based on a short observation period and in the artificial context of a laboratory rather than at home. This might have failed to demonstrate some of the changes recognized by parents through report measures. On the other hand, the more positive results achieved in report measures may reflect a change in parental attitudes caused by the positive focus of the IYPT, where parents are trained to recognize, give attention to and praise and reward their children's positive pro-social behavior.

The low levels of dropout from the intervention, the high attendance rates and high reported levels of satisfaction with the usefulness of teaching methods and specific parenting techniques, also demonstrate the acceptability of the program among Portuguese parents. This may also be a consequence of the planned and consistent removal of barriers and facilitation of service access and continuous engagement (Koerting et al., 2013; Mann, 2008), which are cornerstones of the IY programs (e.g., by providing child-care, snacks and incentives, phone calls during the week, and catch-up sessions for parents who miss a session) (Hutchings, Bywater, & Daley, 2007). Along with the above-mentioned statistically significant positive effects, of which they are a necessary condition, these

results give strong support to the transportability of the program to the Portuguese context. In line with a recent systematic review and meta-analysis on the transportation of evidence-based parenting programs for child problem behavior between countries (Gardner, Montgomery, & Knerr, 2015), adaptations in the program did not appear necessary for successful transportation.

As far as moderator variables are concerned (*Question 2*), the program was shown to be efficacious with a wide range of families (Baydar et al., 2003; Leijten et al., 2015; Menting et al., 2013; Presnall, Webster-Stratton, & Constantino, 2014), regardless of child, mother and context conditions. This may reflect the program leaders' ability to understand, respect and deal with differences (Weisz et al., 2005), with group leaders engaging parents using a collaborative style (Hutchings & Gardner, 2012), and tailoring the program to the specific characteristics and needs of families (Menting et al., 2013; Webster-Stratton, 2009). Group format delivery might also have reduced the differences between families by normalizing the experiences of parents and underlining the issues they have in common (Menting et al., 2013). It is also worth noting that this sample did not have extreme demographic or psychopathological characteristics that could have resulted in some of the moderator effects that emerged in other studies (Lundahl et al., 2006). Unlike other research (Menting et al. 2013; Sonuga-Barke et al., 2013) the initial severity of child behavior was not predictive of intervention effects, maybe because the sample was composed of children without a formal diagnoses (indicated prevention study).

The only variable showing a moderator effect was the child's age on social skills, in line with other studies that found an effect of child's age on treatment outcome (Beauchaine et al., 2005; Lundahl et al., 2006). This result is due to the lower level of social skills exhibited by older than by younger children in the control group, which is contrary to the

expected emergence and gradual development of social knowledge during the preschool period (Langeveld, Gundersen, & Svartdal, 2012). In children with conduct problems this expected progression may be compromised, as these children are often rejected by their peers (Dodge, & Pettit, 2003) and may consequently have fewer opportunities to develop socially acceptable behaviors in response to challenging social situations. Therefore, although in need of further confirmation by other studies, this result signals the program's potential to prevent the deterioration of social functioning as children grow older, with the associated risk of social exclusion, isolation or association with anti-social groups, and involvement in delinquent acts (Hutchings, Bywater, Davies, & Whitaker, 2006; Scott et al., 2001). The importance of conducting interventions as early as possible (Waller et al., 2014) is also suggested by this result. Nevertheless, results of moderator analyses should be interpreted with caution, as type I error is inflated by conducting several of these analyses (Fairchild & MacKinnon, 2010). Indeed, although all the moderator analyses were based on the results of previous research, we cannot exclude that the significant finding could have been due to chance.

The expected mediating effect of parenting practices on child behavior was confirmed, drawing attention to the need to help parents recognize that although they are not necessarily the main cause of the child's problem, they are certainly part of the solution (Gardner & Shaw, 2008). In line with other studies (Dekovic et al., 2010; Roskam & Meunier, 2012), results also suggest that the change in parenting practices is mediated by the change in their sense of parenting self-efficacy, which may be promoted by collaborative, non-judgmental and parent empowering processes, characteristic of the IYPT. As pointed out by Mann (2008), when participants offer support to other parents and are given opportunities to contribute to the program with their own ideas (converted into

principles), their feelings of self-efficacy and competence are fostered. An interesting issue for future research might be to explore how the positive changes observed by parents in children's behavior and in the affective tone of social interactions in the family may, in turn, reinforce this sense of self-efficacy and positive parenting practices.

By and large the positive results were maintained 12 months after the intervention (18 months after baseline) (*Question 3*), even though the follow-up lasted longer than the usual 5 to 6 months (Weisz et al., 2005). This stability may be the consequence of using a program that puts great emphasis on the quality of relationships (Lundahl et al., 2006), and that is tailored according to the families' needs, thus encouraging the integration of new practices into family routines (Lee et al., 2012). By adjusting overall and weekly goals, and home activities according to the parents' capabilities and needs, the IYPT may contribute to the generalization of learning to the home context and subsequent maintenance of effects. However, as for the post-intervention results, follow-up effects as assessed by blind independent raters are less stable than those evaluated by self-report measures, with a significant reduction in the improvements in Positive Parenting and a significant decrease and large (positive) effect in Critical Parenting. In addition to the considerations made above concerning the measures, these mixed results raise some other issues: i) for some skills, positive effects may continue to show up over time; ii) for some families, extra help (more booster sessions, additional intervention) might be necessary to maintain the behavior management techniques learned (Lee et al., 2012; Mann, 2008). Nevertheless, we should bear in mind that these results were based on a smaller number of subjects than recommended by power analysis, and therefore need to be confirmed by future studies.

The IYPT had a positive clinical impact as assessed by parent reports, and that impact was sustained over time, with a high percentage of children reported as moving out of the

risk for externalizing problems. The demonstration of positive functional outcomes (at home, with friends, at school, in hobbies), as recommended in recent literature (e.g., Sonuga-Barke et al., 2013), although an encouraging contribution of this study, relies on a small number of items and must, therefore, be researched in more depth in future studies. Some limitations of the present study need to be considered. First, the characteristics of participant mothers (more highly educated than the national average, with stable marital relationships, medium SES, and being willing to participate in a PT) might make them more receptive to change. Second, the program's participants originated from a heterogeneous source of recruitment (clinical/community). Although no differences in effects between these two groups are found in preliminary analyses of our data (not reported in this paper), the impact of this variable on the IYPT deserves further investigation, as broader effects have been observed in treatment than in prevention studies and, among these, with indicated rather than with selective samples (Menting et al., 2013). A recent research (Scott et al., 2014) also supports the idea that early prevention of antisocial behavior may be effective in the long term for some samples (i.e., indicated) but not for others (i.e., selective).

A third limitation is the poor to fair reliability of some dimensions of the measures used (namely, the CP Scale of the SDQ screening tool and the Child Pro-Social Behavior category of the DPICS), which highlights the importance of cautious interpretation of results and the need for further psychometric studies. Fourth, the fact that the observation of mother-child interaction took place in a single period and was conducted in the artificial environment of a laboratory might have contributed to the loss of ecological validity and consequent instability of results from the observation measure. Future research must try to use measures that guarantee both the independence of assessments and their ecological

validity (Sonuga-Barke et al., 2013). Although direct observation is essential to provide objective measures of behavior, coding systems and procedures must be improved in order to make contents more representative of the children's real life (the multi-method observational measure recently developed by Waller et al., 2014, represents a positive contribution in this field). Finally, although we recognize that booster sessions could have influenced the maintenance of the positive effects, this variable was not analyzed as an independent component of the intervention.

This research has demonstrated the transportability of a PT program, the Incredible Years delivered in 14 weekly sessions plus two booster sessions, to the Portuguese context. The use of such parental interventions might reverse deviant trajectories for some children and the associated negative impact in terms of personal, social and economic costs (Patterson, 2002; Scott et al., 2001). By recognizing that positively focused processes are critical to change, and integrating them as core components of the program, Webster-Stratton's IYPT achieves Kazdin's recommendation (2008) of transposing lessons from research to practice.

This study contributes to the knowledge of the IYPT and to the parent training literature by supporting previous findings that the program is efficacious in reducing behavior problems and their associated negative impacts, and in increasing social skills in children. In addition, it further clarifies some of the processes that might contribute to the efficacy of such interventions. More specifically, it points to the importance of the child's age as a moderator of the positive effects in ways that, to our knowledge, had not been discussed to this point, and underlines the mediating effects not only of parenting practices but also of parental self-efficacy.

In the national context our study contributes to increasing interest and opportunity for use in services of an evidence-based parenting intervention. The potential value of evidence-based interventions in improving youth outcomes (Weisz & Kazdin, 2010; Perrin, Sheldrick, McMenamy, Henson, & Carter, 2014) draws attention to the urgency of transporting this intervention to usual-care Portuguese settings moving from efficacy to effectiveness (Schoenwald & Hoagwood, 2001), increasing dissemination efforts and removing barriers concerning psychosocial care for children in need (Comer et al., 2013). Therefore, Portuguese clinicians as well as other professionals, institutions, and policy makers should work together to make the provision of high quality training, sustained supervision and organizational support for staff possible (Azevedo, Seabra-Santos, Gaspar, & Homem, 2013; Hutchings, 2012; Weisz et al., 2005), so that the positive outcomes demonstrated in this study can benefit families and children outside university trials.

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Table 1

Participants' Characteristics at Baseline

Variable	Group		Test (<i>t</i> / χ^2)	Sig (<i>p</i>)
	IY (<i>n</i> = 68)	WLC (<i>n</i> = 56)		
Child				
Age (years): No (%)				
3-year-olds	19	15		
4-year-olds	22	17	0.05 ^a	.978 ^a
5-year-olds	25	18		
6-year-olds	2	6		
Age (months): Mean \pm SD	55.07 \pm 10.83	56.82 \pm 11.65	-0.86	.389
Sex (male): No (%)	49 (72%)	41 (73%)	0.00	1.000
Type of reference: No (%)				
Clinically referred	35 (51%)	29 (52%)		
Community self-referred	33 (49%)	27 (48%)	0.00	1.000
SDQ Hyperactivity Scale: No (%)	47 (69%)	40 (71%)	0.01	.934
SDQ Conduct Scale: No (%)	54 (79%)	46 (82%)	0.02	.877
PKBS-2 Externalizing Behavior: No (%)				
Low risk	20 (29%)	12 (22%)		
Moderate risk	17 (25%)	17 (31%)	1.08	.584
High risk	31 (46%)	26 (47%)		
PKBS-2 Social Skills: No (%)				
Low risk	24 (35%)	26 (47%)		
Moderate risk	21 (31%)	15 (27%)	1.92	.384
High risk	23 (34%)	14 (26%)		
Early identified behavior problems at school: No (%)	36 (58%)	25 (50%)	0.44	.509
Primary Caregiver				
Age (years) ^b : Mean \pm SD	35.68 \pm 5.24	34.96 \pm 5.81	0.72	.475
Marital Status: No (%)				
Married/as married	55 (83%)	42 (75%)		
Divorced/separated	8 (12%)	12 (21%)	1.94	.380
Single	3 (5%)	2 (4%)		
Years of education: Mean \pm SD	14.07 \pm 4.02	13.49 \pm 3.60	0.84	.404
Depressive symptoms above clinical cut-off (BDI): No (%)	13 (20%)	13 (25%)	0.10	.747

Psychopathology risk (BSI-PSDI): No (%)	24 (40%)	22 (43%)	0.02	.888
Stressful life events above 80th percentile (PSI): No (%)	25 (38%)	23 (44%)	0.26	.611
Family SES^c: No (%)				
Low	21 (31%)	18 (32%)		
Medium	26 (38%)	28 (50%)	3.08	.215
High	21 (31%)	10 (18%)		

Notes. IY = Incredible Years condition; WLC = Waiting-List Control condition; *SD* = Standard deviation; SDQ = Strengths and Difficulties Questionnaire; PKBS-2 = Preschool and Kindergarten Behavior Scales, 2nd ed.; BDI = Beck Depression Inventory; BSI-PSDI = Brief Symptom Inventory - Positive Symptom Distress Index; PSI = Parenting Stress Index; SES = Socioeconomic Status.

^a Six-year-olds were excluded from this analysis.

^b Grandmothers were excluded from this analysis.

^c SES was defined using a standardized classification developed for the Portuguese population considering three categories (Almeida 1988): low (e.g., unskilled workers; industry, transport, agriculture and fishery workers); medium (e.g., intermediate technicians; administrative, trade and services professionals); and high (e.g., owners and entrepreneurs, managers, scientific and intellectual professionals). The family's SES was defined based on the highest professional category and educational level of both parents.

Table 2

Condition (IY/WLC) X Time (Pre-/Post-intervention) Interaction Effects

Variable	<i>n</i>	Baseline IY	Post IY	<i>n</i>	Baseline WLC	Post WLC	T1 - T2 (<i>F</i> , <i>p</i>)	ES (η_p^2)
		T1	T2		T1	T2		
<i>Child</i>								
SDQ - Hd (≥ 7) ^a	65	7.26±2.14	6.05±2.26	49	7.35±1.84	7.10±2.22	8.10 (.005)	.067
SDQ - Cd (≥ 5) ^a	65	6.02±1.96	4.40±2.32	49	5.90±1.61	5.35±1.93	6.77 (.011)	.057
PKBS-SS (≤ 76) ^a	64	72.22±10.66	79.75±8.18	45	73.60±10.64	75.71±10.29	8.45 (.004)	.073
PKBS-EXT (≥ 46) ^a	64	53.06±13.37	44.34±14.77	45	55.04±9.85	52.20±10.76	7.47 (.007)	.065
<i>Mother</i>								
PS	61	3.59±0.55	3.05±0.49	44	3.70±0.57	3.60±0.54	24.44 (.000)	.192
PSOC - Sat	59	31.64±4.82	33.53±4.53	43	28.88±4.92	29.84±5.09	1.47 (.228)	.014
PSOC - Effic	59	23.83±4.40	25.92±3.92	43	23.58±4.81	23.95±4.81	6.79 (.011)	.064
<i>Lab observed behaviors: DPICS</i>								
Child Pro-social	52	7.50±6.61	9.08±6.91	42	7.88±4.97	6.60±4.16	4.34 (.040)	.045
Child Deviance	52	15.18±14.48	12.06±12.50	42	18.21±20.52	14.79±19.89	0.01 (.907)	.000
Positive Parenting	52	17.48±11.93	28.10±13.33	42	15.79±9.78	14.38±6.76	24.52 (.000)	.210
Critical Parenting	52	19.00±10.50	13.35±9.18	42	19.81±14.35	17.79±12.75	2.18 (.143)	.023

Notes: Results are expressed as mean \pm standard deviation. ^aPortuguese threshold for risk. IY = Incredible Years condition; WLC = Waiting-List Control condition; ES = Effect Size (η_p^2 = Partial Eta Squared); SDQ = Strengths and Difficulties Questionnaire; SDQ-Hd = Hyperactivity Scale of the SDQ; SDQ-Cd = Conduct Scale of the SDQ; PKBS = Preschool and Kindergarten Behavior Scales; PKBS-SS = Social Skills scale of the PKBS; PKBS-EXT = Externalizing Problems Subscale of the PKBS; PS = Parenting Scale; PSOC-Sat = Satisfaction subscale of the PSOC; PSOC-Effic = Efficacy subscale of the PSOC; DPICS = Dyadic Parent-Child Interaction Coding System.

Table 3

Comparison between Post-intervention, Follow-up 1 and Follow-up 2 (IY Experimental Condition)

Variable	<i>n</i>	Post-intervention T2	Follow-up T3	Follow-up2 T4	T2 - T3 - T4 (<i>F, p</i>)	ES (η_p^2)
<i>Child</i>						
SDQ - Hd (≥ 7) ^a	51	6.08±2.37	6.37±1.91	6.33±2.10	0.96 (.390)	.038
SDQ - Cd (≥ 5) ^a	51	4.24±2.33	4.18±2.22	4.20±2.11	0.02 (.980)	.001
PKBS-SS (≤ 76) ^a	50	79.64±7.68	80.80±9.60	82.16±9.32	1.95 (.154)	.075
PKBS - EXT (≥ 46) ^a	50	43.62±13.36	44.42±15.04	43.30±13.77	0.23 (.795)	.010
<i>Mother</i>						
PS	48	3.07±0.52	3.08±0.50	3.14±0.52	1.14 (.327)	.047
PSOC - Sat	49	32.92±4.86	33.27±5.41	33.27±5.84	0.25 (.781)	.010
PSOC - Effic	49	25.90±3.67	25.86±3.57	26.20±4.16	0.26 (.771)	.011
<i>Lab observed behaviors: DPICS</i>						
Child Pro-Social	31	8.48±6.79	9.35±4.64	7.84±5.49	0.69 (.474)	.023
Child Deviance	31	13.13±14.22	13.97±18.86	13.71±13.50	0.04 (.937)	.001
Positive Parenting	31	29.84±12.11	25.68±13.85	21.58±10.74	6.48 (.005)	.309
Critical Parenting	31	13.77±9.44	13.06±10.05	10.00±7.57	3.54 (.042)	.196

Notes: Results are expressed as mean ± standard deviation. ^aPortuguese threshold for risk.

IY = Incredible Years condition; WLC = Waiting-List Control condition; ES = Effect Size (η_p^2 = Partial Eta Squared); SDQ = Strengths and Difficulties Questionnaire; SDQ-Hd = Hyperactivity Scale of the SDQ; SDQ-Cd = Conduct Scale of the SDQ; PKBS = Preschool and Kindergarten Behavior Scales; PKBS-SS = Social Skills scale of the PKBS; PKBS-EXT = Externalizing Problems Subscale of the PKBS; PS = Parenting Scale;

PSOC-Sat = Satisfaction subscale of the PSOC; PSOC-Effic = Efficacy subscale of the PSOC; DPICS = Dyadic Parent-Child Interaction Coding System.

Figure 1. Flow of participants through the trial

Figure 2. Moderation effects of child age on child Social Skills (PKBS-SS scores at post-intervention as dependent variable)

Figure 3. Mediation Model 1: Intervention effects in child behavior is mediated by changes in parental practices

Figure 4. Mediation Model 2. IY intervention affects child behavior by changing parental self-efficacy and subsequently parental practices, promoting changes in child externalizing behavior

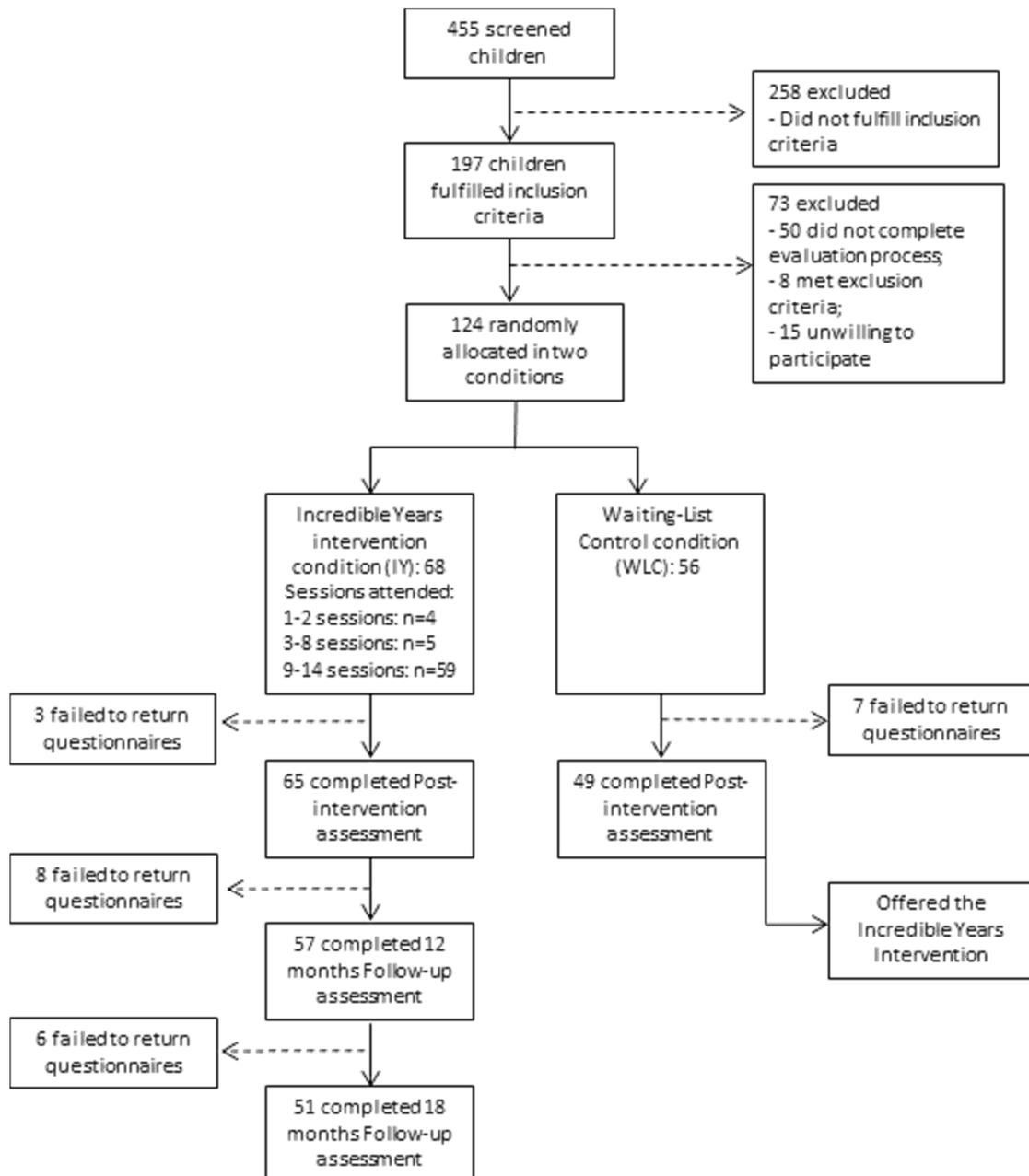


Figure 1. Flow of participants through the trial

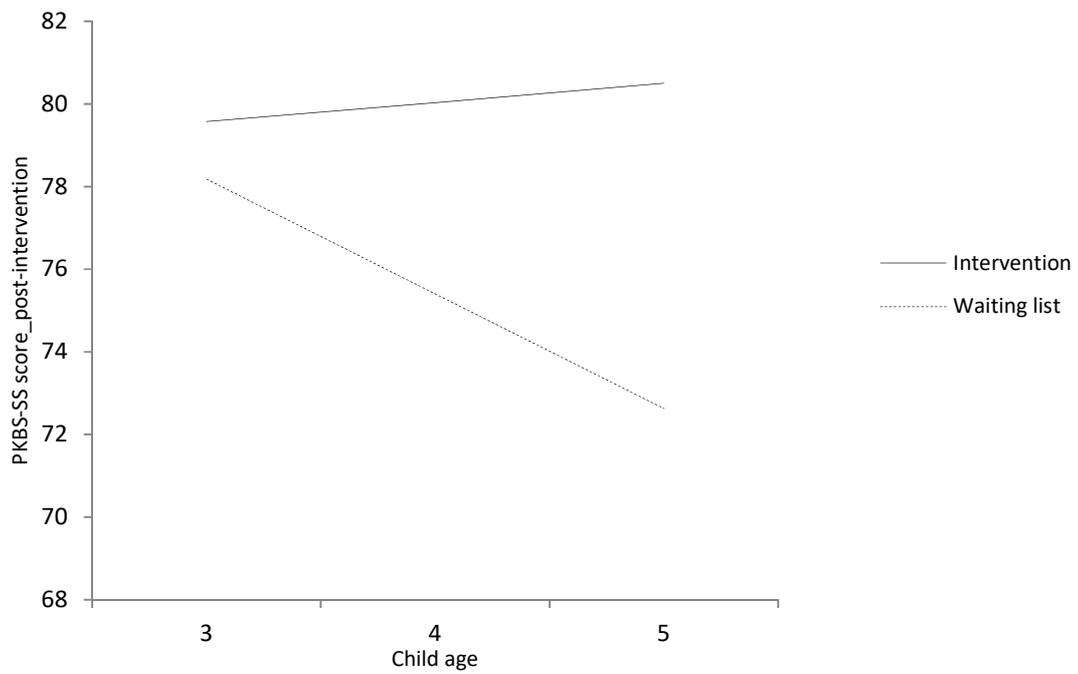


Figure 2. Moderation effects of child age on child Social Skills (PKBS-SS scores at post-intervention as dependent variable)

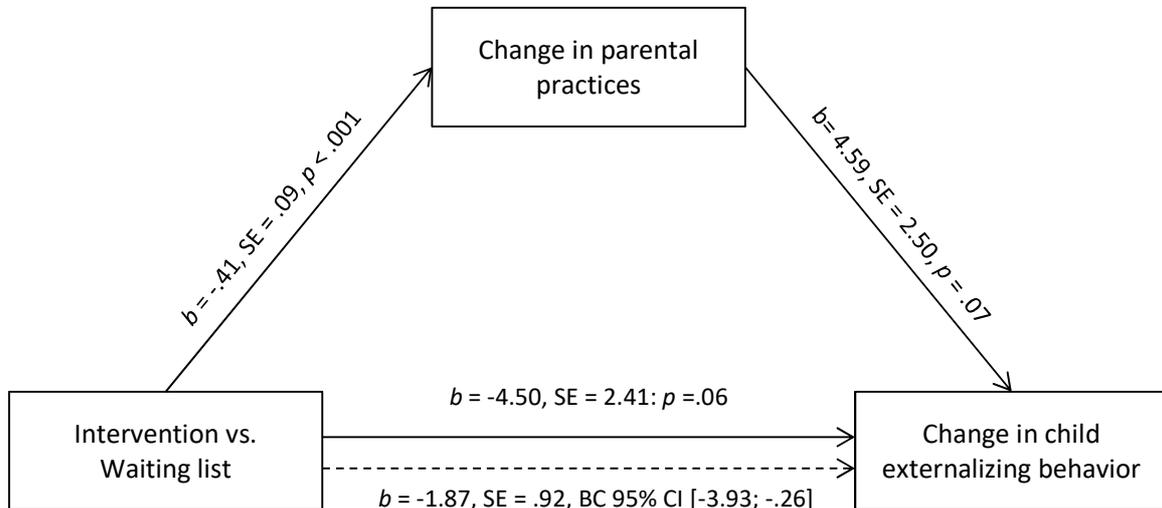


Figure 3. Mediation Model 1: Intervention effects in child behavior is mediated by changes in parental practices.

Straight lines represent the direct effects. The dotted line represents the indirect effect from the bootstrap analysis. BC95%CI = Bias corrected 95% Confidence Interval; Condition: Intervention Group = 0; Waiting list Group = 1; Change in parental behavior was calculated by subtracting the PS total score from post intervention score from the baseline score (T1 – T2); Change in child behavior was calculated by subtracting the PBKS-Ext score from post intervention score from the baseline score (T1-T2).

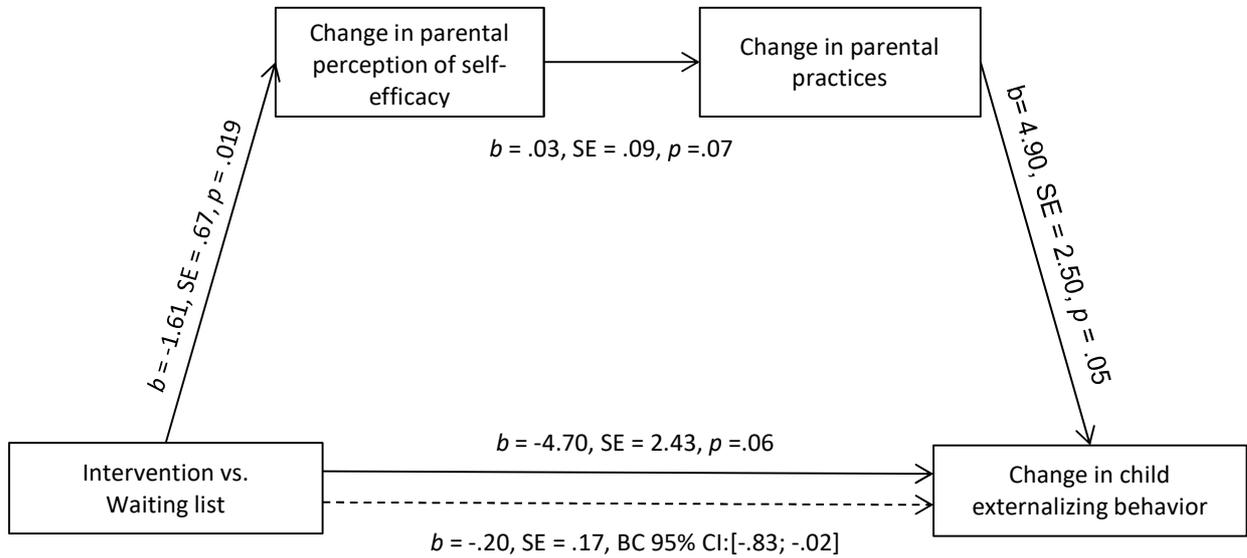


Figure 4. Mediation Model 2. IY intervention affects child behavior by changing parental self-efficacy and subsequently parental practices, promoting changes in child externalizing behavior

Straight lines represent the direct effects. The dotted line represents the indirect effect from the bootstrap analysis. BC95%CI = Bias corrected 95% Confidence Interval; Condition: Intervention Group = 0; Waiting list Group = 1; Change in parental perception of self-efficacy was calculated by subtracting PSOC Efficacy subscale score from post intervention score from the baseline score (T1 – T2); Change in parental behavior was calculated by subtracting the PS total score from post intervention score from the baseline score (T1 – T2); Change in child behavior was calculated by subtracting the PBKS-Ext score from post intervention score from the baseline score (T1-T2).