

Parents Plus Systemic, Solution-Focused Parent Training Programs: Description, Review of the Evidence Base, and Meta-Analysis

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Parents Plus (PP) programs are systemic, solution-focused, group-based interventions. They are designed for delivery in clinical and community settings as treatment programs for families with child-focused problems, such as behavioral difficulties, disruptive behavior disorders, and emotional disorders in young people with and without developmental disabilities. PP programs have been developed for families of preschoolers, preadolescent children, and teenagers, as well as for separated or divorced families. Seventeen evaluation studies involving over 1,000 families have shown that PP programs have a significant impact on child behavior problems, goal attainment, and parental satisfaction and stress. The effect size of 0.57 ($p < .001$) from a meta-analysis of 10 controlled studies for child behavior problems compares favorably with those of meta-analyses of other well-established parent training programs with large evidence bases. In controlled studies, PP programs yielded significant ($p < .001$) effect sizes for goal attainment ($d = 1.51$), parental satisfaction ($d = 0.78$), and parental stress reduction ($d = 0.54$). PP programs may be facilitated by trained front-line mental health and educational professionals.

Keywords: Parent Training; Solution-Focused Therapy; Systemic Child-Focused Intervention

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INTRODUCTION

Parents Plus (PP) programs are systemic, solution-focused, group-based interventions for families with child-focused problems. They are designed for delivery in clinical and community settings for families of children with clinical and subclinical difficulties. Their systemic and solution-focused theoretical basis distinguishes them from other evidence-based group parenting training programs, such as the Incredible Years (Menting, Orobio, & Matthys, 2013) and Triple P (Sanders, Kirby, Tellegen, & Day, 2014) programs. Like these, they have been designed to equip families with the skills for dealing mainly with disruptive behavior disorders, but also with emotional disorders. International epidemiological surveys show that such childhood disorders occur in 10–20% of young people (Rahman & Kieling, 2015).

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The aims of this study were to offer an overview of PP programs; identify all significant empirical studies in the PP evidence base; provide a narrative account of key findings of these studies; and present the results of a meta-analysis indicating overall effects of PP programs and moderators of these effects.

Parents Plus programs help families develop (a) positive family relationships and (b) a constructive approach to discipline issues and conflict management. The current suite of developmentally staged programs evolved from the original PP program (Sharry & Fitzpatrick, 1997), which was designed for families of children aged 4–11 years. In light of evidence for the effectiveness of this program (Behan, Fitzpatrick, Sharry, Carr, & Waldron, 2001; Quinn, 2005; Quinn, Carr, Carroll, & O’Sullivan, 2006, 2007), clinical feedback on ways it could be refined, and the demand for similar programs for preschool children and adolescents, three developmentally staged versions of the intervention were developed. The current suite includes the PP Early Years Program (Sharry, Hampson, & Fanning, 2013) for families of young children aged 1–6 years; the PP Children’s Program (Sharry & Fitzpatrick, 2008) for families of children aged 6–11 years; and the PP Adolescents Program (Sharry & Fitzpatrick, 2012) for families of teenagers aged 11–16 years. For families of adolescents with emotional disorders, the Working Things Out program (Brosnan, Beattie, Fitzpatrick, & Sharry, 2011) has been specifically designed for teenagers to attend while their parents concurrently attend PP Adolescents Program. For families where separation or divorce has occurred, the Parents Plus–Parenting when Separated Program (Sharry, Murphy, & Keating, 2013) has been developed. An outline of these programs is provided in Table S1.

All programs include a facilitator’s manual and printed psychoeducational materials for clients. Each program contains a DVD of vignettes illustrating skills for developing positive parent–child relationships and dealing with parent–child discipline issues in a constructive way. The topics covered in these DVDs were identified in collaboration with families attending child and adolescent mental health service clinics in Ireland. The Working Things Out DVD contains short movies with illustrated graphics, animation, and music based on personal stories of adolescents with depression or anxiety disorders who attended mental health clinics to deal with a range of problems, including loss, trauma, bullying, self-harm, anger management, and comorbid neurodevelopmental disorders such as attention-deficit hyperactivity disorder.

All of these programs involve attending 6–9 small group sessions with 8–12 participants. Group sessions last about 2 hours and programs span 2–3 months. In group sessions, skills are learned through psychoeducation, viewing and discussing video vignettes, role-play, practice, and constructive feedback. In most sessions, both a positive parent–child relationship skill and a discipline skill are covered. In the PP Parenting when Separated Program, in addition to parent–child relationship-building and discipline skills, participants learn skills for co-operative co-parenting, conflict management within the co-parenting relationship, and self-care. In the Working Things Out program, the focus is on adolescents developing self-regulation and relationship-building skills. In all of these programs, typically each group session begins with a review of progress since the previous session and closes with an invitation for participants to practice skills learned during the session in the coming week as homework. Following solution-focused principles, the groups are centered on client goals and there is an emphasis on clients’ strengths and resilience and on creatively using skills in a solution-focused way.

When these programs are offered in clinical settings, additional “individual” sessions are offered to clients which they may attend conjointly with members of their families. In these sessions, clients are helped to implement skills learned in group sessions within their families to achieve specific treatment goals. In the PP Children’s and Adolescents Programs, usually two sessions for individual clients and their families are offered. Where

parents have attended the PP Adolescents Program and their teenagers have concurrently attended the Working Things Out Program, these conjoint family sessions provide a forum for young people and their parents to collaboratively use the communication and negotiation skills they have learned in group sessions to address specific issues and areas of conflict. In the PP Early Years Program, five sessions for individual clients and members of their families are routinely offered. During some of these sessions, child-directed and parent-directed, parent-child interaction is video-recorded. Parents and therapists review these videos collaboratively, and parents are given strengths-focused feedback to help them refine their skills for building strong parent-child relationships and directing their children in an assertive and constructive way. This element of the PP Early Years Program is based on the Marte Meo method (Aarts, 2000).

Parents Plus programs may be facilitated by a range of professionals who undergo an initial 2-day training program and subsequent practice-based supervision leading to accreditation, described at the PP website (<http://www.parentsplus.ie>). In clinical settings, PP programs have been facilitated by professionals from the disciplines of social work, psychology, psychiatry, speech and language therapy, occupational therapy, and nursing. In community settings, they have been facilitated by teachers and child care workers.

THEORETICAL BASIS FOR PP PROGRAMS

Parents Plus programs have been informed by solution-focused systemic therapy, social learning theory, parent training, cognitive behavior therapy, conflict management and negotiation theory, and developmental psychology. The overarching practice framework is systemic and solution-focused. In line with the central assumption of systemic therapy, family relationships are viewed as a major determinant of both positive and negative behavior and experiences of individual family members (Sexton & Lebow, 2015). As solution-focused interventions, all PP programs start by collaboratively creating client-centered goals. Progress toward these goals is made by building on existing skills, resources, and strengths, thus enhancing client resilience (Franklin, Trepper, Gingerich, & McCollum, 2011). A solution-focused groupwork model is employed by facilitators, which encourages group members to support one another and to share ideas and strategies, thus building on group knowledge (Sharry, 2007). In addition, PP facilitators follow a collaborative quality protocol which requires that systematic feedback is collected from clients after each session (e.g., about what worked and what they want more of) and adaptations to program content are made accordingly. In this way, a collaborative therapeutic process is created and parents are empowered to input into the leadership of the program to ensure it meets their goals.

Many of the skills addressed in PP programs are drawn from the parent training (Briesmeister & Schaefer, 2007), cognitive behavior therapy (Dattilio, 2010), and conflict management and negotiation (Fisher, Ury, & Patton, 1981) literature. The collaborative video review process included in the PP Early Years Program is strongly influenced by the Marte Meo method, as outlined in the introduction above (Aarts, 2000). Social learning theory provides a framework for conceptualizing the development of both positive and negative habits and new skills (Bandura, 1976, 1985). Problem behavior and adaptive skills are assumed to be learned through cognitive learning processes (e.g., modeling) and operant and classical conditioning. Video modeling, practice, and feedback are used to help parents learn how to develop solutions to parenting problems. These solutions to parenting problems involve strategies based on both cognitive learning and conditioning principles. PP programs are also informed by developmental psychology, particularly the literature on social and emotional development (Lamb & Lerner, 2015). PP programs are developmentally staged. The preschool children's and adolescents' versions of the PP

program are designed to match the developmental needs and abilities of children at these developmental stages.

IDENTIFICATION OF STUDIES IN THE EVIDENCE BASE FOR PP PROGRAMS

Parents Plus evaluation studies were included in this review and meta-analysis if they were published or unpublished and controlled or uncontrolled trials involving at least 10 cases, conducted before 2016, and if PP programs within these trials were facilitated by professionals trained by the PP organization. Case studies, trials with fewer than 10 cases, and studies in which PP program facilitators were not trained by the PP organization were excluded. All studies were located through the PP organization and its network of trained facilitators. An electronic search did not locate any additional studies. Study identification was conducted by AC and JS, who is the director of the PP organization. Seventeen PP evaluation studies, conducted between 2001 and 2015, were identified. All were conducted in Ireland by program developers and their colleagues from the network of trained PP facilitators in Irish health, social service and educational agencies, and universities. In all studies, program fidelity was maintained by requiring facilitators to follow detailed guidelines in program manuals, complete integrity checklists after each session, and attend pre-program training and regular supervision with program developers. Study characteristics and key findings are given in Table S2.

CHARACTERISTICS OF PP EVALUATION STUDIES

From Table S2, it may be seen that in 17 studies, 919 parents engaged in PP training and 440 were in waiting list control or treatment as usual control groups. In two instances, where the same participants were in two studies, these cases have not been “double counted.” The 22 treated cases in the Quinn et al. (2007) study were included in the Quinn et al. (2006) study as the “developmental disability” group. The 212 cases in the Gerber, Sharry, Streek, and McKenna (2015) study included the 89 cases in the 7-week PP Early Years Program treatment group in the Lonergan, Gerber, Streek, and Sharry (2015) study.

Nine studies were conducted in clinical settings and eight were conducted in community settings. The 17 studies were carried out in a range of settings including child and adolescent mental health services, early intervention team services for developmental disabilities, preschools, schools, special schools for children with intellectual disability, and community clinics.

Families of children ranging in age from 2 to 17 years participated in these studies. In about two thirds of families (67%), the children who parents were concerned about were male. Children’s main presenting difficulties were behavior problems, disruptive behavior disorders (including oppositional defiant disorder, conduct disorder, and attention-deficit hyperactivity disorder), emotional disorders (including anxiety and depressive disorders), and developmental disabilities (including intellectual disability, autism spectrum disorder, and language disorder). In all studies, the majority of clients in PP groups were mothers. In about a quarter of cases (23%), fathers also attended.

Studies varied in design robustness. There were six randomized controlled trials, six nonrandomized controlled trials (in which sequential block designs were used for allocating cases to groups), and five uncontrolled single group trials. In controlled trials, cases in control groups either received treatment as usual or were placed on a waiting list. In studies conducted in clinical settings, treatment as usual involved treatment by a multidisciplinary mental health or disability services team. All of the studies except Hayes, Siraj-Blatchford, Keegan, and Goulding (2013) reported detailed pre- and posttreatment

assessment data. In 11 of the 17 studies, follow-up assessments were conducted, and follow-up periods ranged from 5 months to 2 years. With the exception of the study by Hayes et al. (2013), follow-up data were collected on treatment groups but not control groups. Attrition occurred in all studies and dropout rates before posttreatment assessment ranged from 2% to 33%. In two studies, groups were not matched at baseline on the total difficulties scale of the Strengths and Difficulties Questionnaire (Hand, McDonnell, Honari, & Sharry, 2013; Hand, Ní Raghallaigh, Cuppage, Coyle, & Sharry, 2013). In both instances, the mean of the treatment group was significantly higher than that of the control group at pretreatment, thus potentially biasing the results at posttreatment in favor of the control group. To address this problem, pretreatment scores were taken into account using Klauer's (2001) method in computing between-group posttreatment effect sizes as described below. The Keating, Sharry, Murphy, Rooney, and Carr (2016) study was the only one in which an intent-to-treat analysis was reported. In the remaining investigations, study-completer analyses were conducted. With intent-to-treat analysis, all cases entering the trial are included in data analysis. In completer analysis, only data from cases who completed the trial are analyzed. Because dropouts from the treatment group may have fared worse at posttreatment and follow-up, compared with those who completed the trial, completer analysis carries the risk of biasing results in favor of the treatment group. Also results of analyses of study-completer cases may not have been representative of results from all cases assessed at pretreatment. Most studies in the meta-analysis were underpowered. The sample size in only five studies (Gerber et al., 2015; Hayes et al., 2013; Keating et al., 2016; Lonergan et al., 2015; Nitsch, Hannon, Rickard, Houghton, & Sharry, 2015) was sufficient to provide adequate power ($p = .05$, $\beta = .80$) to detect a small to moderate effect size, which is what has been reported in meta-analyses of other parenting programs (Menting et al., 2013; Sanders et al., 2014).

META-ANALYSIS PROCEDURES

For each study where sufficient data were reported, data were extracted on four dependent variables for treatment and control groups at Time 1 (pretreatment), Time 2 (posttreatment), and Time 3 (follow-up). The dependent variables were child behavior problems, therapeutic goals, parental satisfaction, and parental stress. Child behavior problems were assessed with the total difficulties scale of the parent-report version of the Strengths and Difficulties Questionnaire (Goodman, 2001). The total difficulties scale contains 20 items from Strengths and Difficulties Questionnaire conduct problems, hyperactivity, emotional problems, and peer problems subscales. Goal attainment was assessed with the PP Goals Scale (Sharry & Fitzpatrick, 1997), where parents list up to three child-focused and three adult-focused goals and indicate the extent to which they have achieved each of these using a 10-point response format. Parental satisfaction was assessed with the three-item Kansas Parental Satisfaction Scale (James et al., 1985). Parental stress was assessed with either the 18-item Parenting Stress Scale (Berry & Jones, 1995) or the 36-item short form of the Parenting Stress Index (Abidin, 1995). The short form of the Parenting Stress Index includes items from the parent-child dysfunctional interactions, parent distress, and difficult child subscales. With the exception of the Goals Scale, which is an ideographic index of goal attainment, all of these instruments have been shown in psychometric studies to have acceptable levels of internal consistency reliability and construct validity (Abidin, 1995; Berry & Jones, 1995; Goodman, 2001; James et al., 1985).

For each study where sufficient data were reported, data were extracted on 11 potential moderators: number of cases in the study, randomization, child's age, percentage of male children, percentage of father involvement, program type, clinical status, concurrent child intervention, total number of sessions, number of nongroup family sessions, and duration

of follow-up period. For randomization, studies were coded as randomized, nonrandomized, or single group trials. Child's age was coded as the mean child age of study completers or an estimate of this where only age ranges were reported. Percentage of male children was coded as the percentage of male children who completed the study, or where this was unavailable, the percentage of male children who entered the study. Percentage of fathers was coded as the percentage of fathers who completed the study, or where this was unavailable, the percentage of fathers who entered the study. For program type, studies were coded as PP Early Years Programs, PP Child Program, or PP Adolescent Program; studies using the original PP Program and the PP Parenting when Separated Program were omitted from analysis of this moderator. For clinical status, studies were coded as community-based studies containing nonclinical cases or treatment studies containing clinical cases. Problem severity was indicated by the mean total difficulties score on the parent-completed version of the Strengths and Difficulties Questionnaire (Goodman, 2001). For concurrent child intervention, studies were coded as those where there was no concurrent child intervention; those where concurrent intervention was provided by a multidisciplinary child psychiatry team; or those where adolescents engaged in the Working Things Out program. Total number of sessions was coded as the total number of group PP program sessions and additional nongroup PP program sessions provided to individual families. Number of nongroup family sessions was coded as 0 for studies of nonclinical cases; 5 for studies of clinical cases in the PP Early Years Program; or 2 for studies of clinical cases in the PP Child Program and PP Adolescent Program. Duration of follow-up period was coded as the number of months between program completion and follow-up assessment.

For each dependent variable in each study, where sufficient data were available, three effect sizes were calculated. The first was an effect size reflecting change in the PP treatment group from Time 1 to Time 2, referred to as d_{T1-T2} . The second was an effect size reflecting change in the PP treatment group from Time 1 to Time 3, referred to as d_{T1-T3} . The third was an effect size reflecting the difference between the PP treatment and control group at Time 2, which took account of scores of both groups at Time 1, referred to as d_{PPVC} . For d_{T1-T2} and d_{T1-T3} , where effect sizes reflected differences between two means, Cohen's d standardized mean difference was calculated using the Campbell Collaboration calculator (Wilson, n.d.). Lenhard and Lenhard's (2015) calculator and Klauer's (2001) method were used to calculate d_{PPVC} , which is based on four means from assessments conducted at Times 1 and 2 in treatment and control groups. Using this method, first, Time 1 to Time 2 standardized mean difference effect sizes were calculated separately for treatment and control groups. Then, the standardized mean difference between these two effect sizes was calculated. All effect sizes for individual studies were calculated using means and standard deviations in papers listed in Tables S3–S6. Mean effect sizes and confidence intervals given in bold in Tables S3–S6 are weighted averages. Following Cohen's (1977) interpretation guidelines, effect sizes of 0.2 were considered small, 0.5 medium, and 0.8 large.

The Comprehensive Meta-Analysis (Borenstein, Hedges, Higgins, & Rothstein, 2005) software package was used to conduct all meta-analyses. In these, the effect size for each study was weighted based on the inverse of the variance, which is roughly proportional to sample size, but is a more nuanced measure (Borenstein, Hedges, Higgins, & Rothstein, 2009). This procedure allows more weight to be assigned to studies that carry more information. Before analyzing effect size data from multiple studies, the Q test for heterogeneity was conducted to determine if there was significant variation between studies, and the I^2 index was calculated to determine the degree of heterogeneity (Huedo-Medina, Sanchez-Meca, Marin-Martinez, & Botella, 2006). Results of Q and I^2 tests are included in Tables S3–S6. A significant Q statistic indicates significant heterogeneity among effect sizes. With the I^2 index, 25%, 50%, and 75% indicate small, medium, and large degrees of

heterogeneity, respectively. Where groups of effect sizes were homogenous, a fixed effects model was used for data analysis, and a random effects model was used for analyzing data when the Q test was significant (Borenstein et al., 2009).

For each group of effect sizes analyzed, a main effects test was conducted to determine if the mean effect size differed from zero. Then, a series of regression analyses was conducted to determine if variability in outcome was due to any of the 11 potential moderators mentioned above. In these regression analyses, each potential moderator was entered separately. Meta-regression analyses were conducted with Comprehensive Meta-Analysis Version 2 (Borenstein et al., 2005). Meta-regression analyses were not conducted where there were insufficient studies to do so or where there were collinearity problems. In these analyses, all potential moderators were treated as continuous variables except randomization, program type, clinical status, and concurrent child intervention, which were treated as categorical variables, and analyzed following meta-regression procedures outlined in Borenstein, Hedges, Higgins, and Rothstein (2015).

The large number of statistical tests in the analysis inflated the risk of type I error. However, using the Bonferroni correction to control for the large number of statistical tests would have increased the risk of type II error because of the low power of these tests to detect significant results associated with the relatively small number of studies in the meta-analysis. With these considerations in mind, no correction for type I error was made. However, tests significant at $p < .05$ (rather than at $p < .01$ or $p < .001$) may be interpreted cautiously.

RESULTS

In presenting results, first overall effect sizes from all studies will be given. Then, significant moderators of these overall effects will be considered. This will be followed by a narrative review of studies and effect sizes from meta-analyses of subgroups of studies on each of the five versions of the PP program.

Overall Effect Sizes

From Tables S3–S6, it may be seen that on indices of child behavior problems, goal attainment, parental satisfaction, and parental stress, d_{T1-T2} , d_{T1-T3} , and d_{PPvC} effect sizes in 16 studies of all 5 versions of the PP program ranged from small (0.12) to large (3.01). Overall mean effect sizes ranged from medium (0.55) to large (1.96); all were significantly greater than zero ($p < .05$); and 9 of 12 overall mean effect sizes were highly statistically significant ($p < .001$).

Greatest effect sizes occurred for goal attainment. Mean effect sizes ranged from medium (0.50) to large (3.01; Table S4). The overall mean d_{T1-T2} , d_{T1-T3} , and d_{PPvC} effect sizes for goal attainment were 1.85 ($p < .05$), 1.96 ($p < .001$), and 1.51 ($p < .05$), respectively, and all were large and significant. The d_{T1-T2} and d_{T1-T3} effect sizes of 1.85 and 1.96 indicate that, for goal attainment, after PP programs and at follow-up families who engaged in these programs fared better than 96% and 97% of families, respectively, before treatment. The d_{PPvC} effect size of 1.51 indicates that, for goal attainment, clients who engaged in PP programs fared better than 93% of those in control groups.

For child behavior problems, mean effect sizes ranged from small (0.18) to large (1.47; Table S3). The overall mean d_{T1-T2} , d_{T1-T3} , and d_{PPvC} effect sizes for child behavior problems were 0.60, 0.79, and 0.57, respectively, and all were medium to large and highly significant ($p < .001$). The d_{T1-T2} and d_{T1-T3} effect sizes of 0.60 and 0.79 indicate that, for child behavior problems, after PP programs and at follow-up, families who engaged in these programs fared better than 73% and 78% of families, respectively, before treatment.

The d_{PPvC} effect size of 0.57 indicates that, for child behavior problems, clients who engaged in PP programs fared better than 72% of those in control groups.

For parental satisfaction, mean effect sizes ranged from small (0.32) to large (1.95; Table S5). The overall mean d_{T1-T2} , d_{T1-T3} , and d_{PPvC} effect sizes for parental satisfaction were 0.85 ($p < .001$), 1.01 ($p < .05$), and 0.78 ($p < .001$), respectively. The d_{T1-T2} and d_{T1-T3} effect sizes of 0.85 and 1.01 indicate that, for parental satisfaction, after PP programs and at follow-up families who engaged in these programs fared better than 80% and 84% of families, respectively, before treatment. The d_{PPvC} effect size of 0.78 indicates that, for parental satisfaction, clients who engaged in PP programs fared better than approximately 78% of those in control groups.

For parental stress, mean effect sizes ranged from small (0.12) to large (1.94; Table S6). The overall mean d_{T1-T2} , d_{T1-T3} , and d_{PPvC} effect sizes for parental stress were 0.64, 0.75, and 0.54, respectively, and all were medium to large and highly significant ($p < .001$). The d_{T1-T2} and d_{T1-T3} effect sizes of 0.64 and 0.75 indicate that, for parental stress, after PP programs and at follow-up families who engaged in these programs fared better than 74% and 77% of families, respectively, before treatment. The d_{PPvC} effect size of 0.54 indicates that, for parental stress, clients who engaged in PP programs fared better than approximately 70% of those in control groups.

Moderator Analyses

Results of moderator analyses are given in Tables S7–S10. Two study design features (randomization and number of cases in the study), two child characteristics (age and problem severity), and three program attributes (number of sessions, concurrent child intervention, and program type) significantly moderated the impact of PP programs on effect sizes. Better outcomes occurred in smaller randomized trials in which families had younger children with less severe problems, attended more sessions, and had less concurrent child intervention. Better goal attainment occurred in PP Early Years and Children's programs (compared with the Adolescents program) and greatest parental satisfaction occurred in the PP Children's program.

From Table S7, it may be seen that randomization was a significant predictor of child behavior problem d_{T1-T2} effect sizes. The mean child behavior problem d_{T1-T2} effect size for randomized controlled trials (0.88) was significantly larger than those for nonrandomized controlled trials (0.55) and single group studies (0.48).

From Table S8, it may be seen that child's age, child behavior problem severity, concurrent intervention, and program type were significant predictors of goal attainment effect sizes. Studies of families with younger children yielded greater goal attainment d_{T1-T2} effect sizes. Studies of families of children with less severe problems yielded greater goal attainment d_{T1-T3} effect sizes. The mean goal attainment d_{T1-T2} effect size for studies in which there was no concurrent intervention (2.13) was significantly larger than that for studies in which there was concurrent intervention (1.92), which was significantly larger than that for studies in which adolescents attended the Working Things Out Program (0.42). This counterintuitive finding probably reflects the greater complexity of problems of families of young people in programs involving greater levels of concurrent intervention, and this higher level of problem complexity may have compromised goal attainment from Time 1 to Time 2. Analysis of goal attainment data from the PP Early Years and Children's and Adolescents Programs showed that the mean d_{T1-T2} effect size for studies of the Children's Program (2.55) and the PP Early Years Program (2.38) was significantly larger than that for studies of the PP Adolescents Program (1.23).

From Table S9, it may be seen that number of sessions, number of cases in the study, and program type were significant predictors of parental satisfaction effect sizes. Studies

in which there were fewer cases and in which clients attended more sessions yielded larger parental satisfaction d_{PPVC} effect sizes. The mean parental satisfaction d_{T1-T2} effect size for the PP Children's program (1.44) was significantly greater than that for the PP Adolescents program (0.81), and this was significantly greater than that of the PP Early Years Program (0.47).

From Table S10, it may be seen that concurrent child intervention was a significant predictor of parental stress d_{T1-T3} effect sizes. The mean parental stress d_{T1-T3} effect size for studies in which there was no concurrent intervention (1.94) was significantly larger than those for studies in which there was concurrent intervention (0.64) or where adolescents attended the Working Things Out Program (0.58). This counterintuitive finding probably reflects the greater complexity of problems of families of young people in programs involving greater levels of concurrent intervention, and this higher level of problem complexity may have prevented the reduction in parental stress from Time 1 to Time 3.

Evaluation Studies of the Original PP Program

Three studies of the original PP program have been conducted (Behan et al., 2001; Quinn, 2005; Quinn et al., 2006, 2007). Participants in all three studies were attending clinical services and had been diagnosed with disruptive behavior disorders or developmental disabilities. In a randomized controlled trial of families of children with disruptive behavior disorders attending mental health clinics at two Dublin university hospitals, Behan et al. (2001) found that compared with the treatment as usual control group, after treatment the PP group showed a near-significant trend ($p < .09$) for greater improvement on a range of measures with gains maintained at follow-up. In a nonrandomized controlled trial of families of children with developmental disabilities and comorbid disruptive behavior disorders attending rural early intervention clinics, Quinn (2005) and Quinn et al. (2007) found that compared with the treatment as usual control group, after treatment the PP group showed significantly greater improvement on a range of measures with gains maintained at follow-up. In a further nonrandomized controlled trial comparing families of children with developmental disabilities and comorbid disruptive behavior disorders attending rural early intervention clinics, and families of children with disruptive behavior disorders but without developmental attending rural mental health clinics, Quinn (2005) and Quinn et al. (2006) found that both groups showed significant improvement after treatment on a range of measures with gains maintained at follow-up.

From Tables S3–S6, it may be seen that on indices of child behavior problems, goal attainment, parental satisfaction, and parental stress, d_{T1-T2} , d_{T1-T3} , and d_{PPVC} effect sizes in the three studies of the original PP program ranged from small (0.18) to large (2.88). Greatest effect sizes occurred for goal attainment (Table S4), with the mean d_{T1-T2} and d_{T1-T3} effect sizes being 1.64 ($p < .01$) and 1.90 ($p < .05$), respectively. In the single study where there were sufficient goal attainment data to compute a d_{PPVC} effect size, this was between medium and large (0.74). Smallest mean effect sizes occurred for parental stress (Table S6). These fell within the small to medium range. The mean d_{T1-T2} , d_{T1-T3} , and d_{PPVC} effect sizes for parental stress were 0.44 ($p < .05$), 0.42 ($p < .05$), and 0.25 (*ns*), respectively, and it is noteworthy that the d_{PPVC} effect size was not statistically significant. The magnitude of mean effect sizes for parental satisfaction and child behavior problems fell between those of goal attainment and parental stress. Mean effect sizes for parental satisfaction were large (Table S5). The mean d_{T1-T2} and d_{T1-T3} effect sizes for parental satisfaction were 0.98 ($p < .001$) and 0.89 ($p < .05$), respectively. In the single study where there were sufficient parental satisfaction data to compute a d_{PPVC} effect size, this was between medium and large (0.67). For child behavior problems, mean effect sizes

were moderate to large (Table S3). The mean d_{T1-T2} , d_{T1-T3} , and d_{PPvC} effect sizes for child behavior problems were 0.52 ($p < .01$), 0.84 ($p < .01$), and 0.62 ($p < .01$), respectively.

Evaluation Studies of the PP Early Years Program

Six evaluation studies of the PP Early Years Program have been conducted (Gerber et al., 2015; Griffin, Guerin, Sharry, & Drumm, 2010; Griffin, Sharry, Guerin, & Drumm, 2006; Hayes et al., 2013; Kilroy, Sharry, Flood, & Guerin, 2011; Lonergan et al., 2015; Sharry, Guerin, Griffin, & Drumm, 2005). Two have been run in clinical settings to treat children diagnosed with disruptive behavior disorders and developmental disabilities (Griffin et al., 2006, 2010; Sharry et al., 2005), and four were conducted in community settings where more than half of the families had children without clinically significant behavior problems (Gerber et al., 2015; Hayes et al., 2013; Kilroy et al., 2011; Lonergan et al., 2015). In an uncontrolled single group pilot study of families of children with disruptive behavior disorders and developmental disabilities attending a Dublin university hospital mental health clinic, Sharry et al. (2005) found that a 12 session clinical version of PP Early Years Program led to significant improvements on a range of variables. This provided the impetus for conducting a larger controlled trial in the same setting with similar cases. Griffin et al. (2006) obtained similar positive results in this nonrandomized controlled trial as were found in the pilot study. In qualitative interviews of participants in this study, Griffin et al. (2010) found that 47% of parents highlighted the value of the PP Early Years Program group setting as both a source of support and a forum for skills development.

In a small uncontrolled single group pilot study of families of nonreferred children in the community, Kilroy et al. (2011) found that a six-session version of PP Early Years Program led to significant improvements on a range of variables, and greatest improvement occurred for a subgroup of cases with particularly severe behavior problems on the Strengths and Difficulties Questionnaire. These positive results justified conducting a large-scale community-based study involving over 200 families. In this single group outcome study, Gerber et al. (2015) obtained similar positive results to those found in the Kilroy et al. (2011) pilot study. Lonergan et al. (2015) compared the outcome for a subgroup of cases from the Gerber et al. (2015) study, with that of a group of matched cases who attended a half-day workshop based on material from PP Early Years Program. They found that both programs led to significant improvements on a range of variables, but that the 7-week version of PP Early Years Program led to greater improvements than the half-day workshop. In a large 2-year multisite community-wide randomized controlled trial, Hayes et al. (2013) included the 7-week version of PP Early Years Program as one element in a multicomponent preventative intervention for families of preschool children. They found that parents who attended more PP Early Years Program sessions created better home-learning environments by engaging their children in more learning activities. Unfortunately, pre- and posttreatment data for the PP Early Years Program group and the treatment as usual control group were not reported in a way to permit determining the comparative effectiveness of PP Early Years Program in this study or to compute effect sizes.

From Tables S3–S6, it may be seen that on indices of child behavior problems, goal attainment, parental satisfaction, and parental stress d_{T1-T2} , d_{T1-T3} , and d_{PPvC} effect sizes in 5 studies of all versions of the PP Early Years Program ranged from small (0.13) to large (2.63). Greatest effect sizes occurred for goal attainment (Table S4), where the mean d_{T1-T2} effect size was 2.38 ($p < .001$). In the single study where there were sufficient goal attainment data to compute a d_{PPvC} effect size, this was also large (1.56). There were insufficient goal attainment data to calculate a d_{T1-T3} effect size. For child behavior

problems, mean effect sizes ranged from small to large (Table S3). The mean d_{T1-T2} , d_{T1-T3} , and d_{PPvC} effect sizes for child behavior problems were 0.52 ($p < .01$), 0.83 ($p < .001$), and 0.52 ($p < .001$), respectively. For parental stress, mean effect sizes ranged from small to large (Table S6). The mean d_{T1-T2} , d_{T1-T3} , and d_{PPvC} effect sizes for parental stress were 0.61 ($p < .001$), 1.04 ($p < .001$), and 0.41 ($p < .01$), respectively. From Table S5, it may be seen that the mean d_{T1-T2} effect size for parental satisfaction was small to medium (0.47, $p < .05$). In the single study where there were sufficient parental satisfaction data to compute a d_{PPvC} effect size, this was between small and medium (0.32). There were insufficient parental satisfaction data to calculate a d_{T1-T3} effect size.

Evaluation Studies of the PP Children's Program

There have been three studies of the PP Children's Program, one of which was conducted in a child and adolescent mental health clinic setting (Coughlin, Sharry, Fitzpatrick, Guerin, & Drumm, 2009; Coughlin, Sharry, Guerin, & Beattie, 2009); another was run in a school for children with intellectual disability (Hand et al., 2013); and a third was carried out in regular primary schools (Hand et al., 2013). In a nonrandomized controlled trial of families of children with disruptive behavior disorders and developmental disabilities attending child and adolescent mental health clinics at two Dublin university hospitals, Coughlin et al. (2009) found that compared with the treatment as usual control group, after treatment the PP Children's Program group showed significantly greater improvement on a range of measures, with gains maintained at follow-up. In qualitative interviews, parents said group support was the main benefit of participating in the PP Children's Program, and the most useful skills covered were advice on how to "tune in" to their children, play with them, use planned sanctions to discipline them, and stepping back from conflict situations (Coughlin et al., 2009). In a randomized controlled trial of families of children with developmental disabilities attending a school for children with intellectual disability, Hand et al. (2013) found that compared with the waiting list control group, after treatment the PP Children's Program group showed significantly greater improvement on a range of measures. In this study, PP Children's Program was adapted to address specific concerns of parents of children with developmental disabilities and also for parents with mild intellectual disability. Hand et al. (2013) conducted a randomized controlled trial involving families of nonreferred children attending regular primary schools in the community. In this study, they found that compared with the waiting list control group, after treatment the PP Children's Program group showed significantly greater improvement on a range of measures and these improvements were maintained at follow-up.

From Tables S3–S6, it may be seen that on indices of child behavior problems, goal attainment, parental satisfaction, and parental stress d_{T1-T2} , d_{T1-T3} , and d_{PPvC} , effect sizes in 3 studies of PP Children's Program ranged from small (0.25) to large (3.01). Greatest mean effect sizes occurred for goal attainment (Table S4). The mean d_{T1-T2} , d_{T1-T3} , and d_{PPvC} effect sizes for goal attainment were 2.55, 2.37, and 2.01, respectively, and all were large and highly significant ($p < .001$). For child behavior problems, mean effect sizes ranged from medium to large (Table S3). The mean d_{T1-T2} , d_{T1-T3} , and d_{PPvC} effect sizes for child behavior problems were 0.56, 0.66, and 0.64, respectively, and all were highly significant ($p < .001$). For parental stress, mean effect sizes ranged from medium to large (Table S6). The mean d_{T1-T2} , d_{T1-T3} , and d_{PPvC} effect sizes for parental stress were 0.92 ($p < .05$), 1.32 ($p < .001$), and 0.64 ($p < .001$), respectively. The mean d_{T1-T2} and d_{PPvC} effect sizes for parental satisfaction were 1.44 and 1.21 (Table S5). Both were large and highly significant ($p < .001$). In the single study where there were sufficient parental satisfaction data to compute a d_{T1-T3} effect size, this too was large (1.95).

Evaluation Studies of the PP Adolescents Program and Working Things Out Program

Four studies of the PP Adolescents Program have been conducted. In two of these adolescents attended the Working Things Out Program, while their parents concurrently attended the PP Adolescents Program (Rickard et al., 2015; Wynne, Brosnan, Doyle, Kenny, & Sharry, 2016). There were also conjoint family sessions held midway through these programs and at the end of treatment. Two studies were run in child and adolescent mental health clinics with families of adolescents with psychological disorders (Beattie, O'Donohoe, Guerin, & Fitzpatrick, 2011; Wynne et al., 2016), and two were conducted in schools (Nitsch et al., 2015; Rickard et al., 2015). In a nonrandomized controlled trial of families of adolescents with disruptive behavior disorders, emotional disorders, and developmental disabilities attending mental health clinics at two Dublin university hospitals, Beattie et al. (2011) found that compared with the treatment as usual control group, after treatment the PP Adolescent Program group showed significantly greater improvement on a range of measures, with gains maintained at follow-up. In a randomized controlled trial of the PP Adolescents Program offered to families of normal adolescents attending regular secondary schools in a rural community, Nitsch et al. (2015) found that compared with the waiting list control group, after treatment the PP Adolescent Program group showed significantly greater improvement on a range of measures. These gains were maintained at follow-up. In a single group outcome study in public health service child and adolescent mental health clinics, Wynne et al. (2016) evaluated the combined effectiveness of the PP Adolescents Program and the Working Things Out Program for families of adolescents with disruptive behavior disorders and emotional disorders. After treatment, there was significant improvement on a range of parent- and adolescent-completed measures of adjustment. In another single group outcome study conducted in eight high schools, Rickard et al. (2015) evaluated the combined effectiveness of the PP Adolescents Program and the Working Things Out Program. The programs were offered to families of adolescents, a significant proportion of whom were at risk of developing psychological disorders. On a range of parent- and adolescent-completed measures of adjustment, significant improvement occurred after treatment and gains were maintained at 5-month follow-up.

It is noteworthy that two further studies of the Working Things Out Program offered to adolescents with disruptive behavior disorders and emotional disorders attending child and adolescent mental health clinics without parents concurrently attending the PP Adolescent Program led to positive results (Brosnan, 2015; Fitzpatrick et al., 2015). These studies are not listed in Tables S2–S6, since they did not involve an evaluation of PP. In a randomized controlled trial conducted by Fitzpatrick et al. (2015), there were 14 completers in the Working Things Out Program group and 14 in the treatment as usual control group who received multidisciplinary intervention. Both groups showed significant improvement in global functioning after treatment and at 3-month follow-up on the Children's Global Assessment Scale (Shaffer et al., 1983) and in adaptive coping on the Adolescent Coping Scale (Frydenberg & Lewis, 1993). In a nonrandomized controlled trial conducted by Brosnan (2015), there were 30 completers in the Working Things Out Program group and 27 in the treatment as usual control group who received multidisciplinary intervention. At posttreatment, the Working Things Out Program group showed significantly greater improvement on the clinician-completed Child Global Assessment Scale (Shaffer et al., 1983) compared with the control group. Both groups improved from pretreatment to follow-up on the parent- and adolescent-completed Strengths and Difficulties Questionnaire total difficulties and emotional problems scales, the adolescent-completed Strengths and Difficulties Questionnaire peer problem scale, and depression on the adolescent-completed Adolescent Well-being Scale (Birlleson, 1980).

From Tables S3–S6, it may be seen that on indices of adolescent behavior problems, goal attainment, parental satisfaction, and parental stress, d_{T1-T2} , d_{T1-T3} , and d_{PPVC} effect sizes in four studies of the PP Adolescents Program ranged from small (0.12) to large (2.02). Greatest effect sizes occurred for goal attainment (Table S4). The mean d_{T1-T2} and d_{PPVC} effect sizes were 1.23 ($p < .05$) and 1.31 ($p < .05$), respectively, and were large. In the single study where there were sufficient goal attainment data to compute a d_{T1-T3} effect size, this was also large (1.34). For adolescent behavior problems, mean effect sizes ranged from medium to large (Table S3). The mean d_{T1-T2} , d_{T1-T3} , and d_{PPVC} effect sizes for adolescent behavior problems were 0.60 ($p < .01$), 0.74 (*ns*), and 0.83 ($p < .05$), respectively, and it is noteworthy that the d_{T1-T3} effect size was not statistically significant. For parental stress, mean effect sizes ranged from medium to large (Table S6). The mean d_{T1-T2} , d_{T1-T3} , and d_{PPVC} effect sizes for parental stress were 0.61 (*ns*), 0.50 ($p < .001$), and 0.76 ($p < .001$), respectively, and it is noteworthy that the d_{T1-T2} effect size was not statistically significant. The mean d_{T1-T2} and d_{T1-T3} effect sizes for parental satisfaction were 0.81 ($p < .001$) and 0.70 ($p < .05$), respectively, and were medium to large (Table S5). In the single study where there were sufficient parental satisfaction data to compute a d_{PPVC} effect size, this was large (1.08).

Evaluation Study of the PP Parenting When Separated Program

Only one study of the PP Parenting When Separated Program has been conducted (Keating et al., 2016). In this community-based study, cases were recruited through a national organization for separated families. The study aimed to prevent escalation of separation-related parenting problems. Compared with the waiting list control group, after treatment Keating et al. (2016) found that the PP Parenting When Separated Program group showed significantly greater improvement on a range of child and adult adjustment variables, notably interparental conflict.

From Tables S3–S5, it may be seen that on indices of child behavior problems, goal attainment, and parental satisfaction, d_{T1-T2} and d_{PPVC} effect sizes in the Keating et al. (2016) study of the PP Parenting When Separated Program ranged from small (0.31) to large (1.51). Greatest effect sizes occurred for goal attainment where the mean d_{T1-T2} and d_{PPVC} effect sizes were 1.51 and 1.13, respectively, and were large (Table S4). The mean d_{T1-T2} and d_{PPVC} effect sizes for child behavior problems were 0.89 and 0.31, respectively, and ranged from small to large (Table S3). The mean d_{T1-T2} and d_{PPVC} effect sizes for parental satisfaction were both 0.37 and were small (Table S5).

CONCLUSIONS AND DISCUSSION

This review of 17 evaluation studies involving over 1,000 families has shown that PP programs have a significant impact on child behavior problems, parental satisfaction, parental stress reduction, and therapeutic goal attainment. They are effective in the treatment of families with clinically significant child-focused problems, including disruptive behavior disorders, emotional disorders, and developmental disabilities. They are also effective when delivered in community settings to families of children with subclinical behavioral problems. They are effective for families of preschoolers, school-aged children, and adolescents. They are also helpful for separated or divorced families, where they have a significant effect on co-parental cooperation. Better outcomes occurred in smaller randomized trials in which families had younger children with less severe problems, attended more sessions, and had less concurrent child intervention. Better goal attainment occurred in Early Years and Children's programs. Greatest parental satisfaction occurred in the Children's program. However, these findings from moderator analysis require

cautious interpretation because of the risk of type I error associated with conducted a large number of statistical tests.

The effect size of 0.57 from our meta-analysis of 10 controlled studies of PP programs for child behavior problems compares very favorably with those of 0.3 and 0.47 from meta-analyses of the Incredible Years (Menting et al., 2013) and Triple P (Sanders et al., 2014) parent training programs, respectively. Both of these are well-established parent training programs with large evidence bases.

Parents Plus programs share practices in common with other group-based parent training interventions such as the Incredible Years and Triple P programs. These include, for example, peer support of parents for each other in the training group and emphasizing the importance of both improving parent-child relationships and managing discipline issues. However, a number of features distinguish PP programs from other group parent training interventions. PP programs involve systemic and solution-focused practices which make them particularly accessible to family therapists. These practices are familiar to family therapists who utilize solution-oriented techniques, which have been shown to be effective in family therapy for child-focused problems (Anderson, 2015; Bond, Woods, Humphrey, Symes, & Green, 2013). The PP video modeling materials were developed in Ireland, and so PP programs are particularly suited to the Irish context where the programs have been widely disseminated. In clinical settings, additional sessions are offered to clients which they may attend conjointly with members of their families. In these sessions, clients are helped to implement skills learned in group sessions within their families to achieve specific treatment goals. In the PP Early Years Program in these nongroup sessions, clients collaboratively review video recordings of themselves interacting with their preschool children to identify and refine effective parenting practices.

Studies contained in the evidence base for PP programs have methodological limitations. Of 17 studies, only 6 were randomized controlled trials. Most studies were underpowered. Treatment and control groups were not always matched on critical baseline variables. Father involvement in PP programs was relatively low. Intent-to-treat analyses were the exception rather than the rule, with the risk of biasing results in favor of treatment groups. All studies were conducted by model developers or members of the model developers' professional network, and this may have inflated effect sizes. However, Sanders et al. (2014) found that this variable did not inflate effect sizes in a meta-analysis of Triple P program studies.

Studies contained in the evidence base for PP have important strengths which deserve mention. Studies were conducted by facilitators in settings that are representative of "real-world" contexts in which PP programs are intended to be widely implemented, that is, by frontline professionals in mental health clinics, early intervention developmental disability services, preschools, schools, and community agencies. Frontline professionals were trained (in a relatively brief time period) and supervised to facilitate PP programs with sufficient fidelity to make implementation clinically effective. Pre- and posttreatment assessments were conducted with brief, reliable, and valid psychometric instruments. Despite small sample sizes and low statistical power, statistically significant effects were found. In most studies, follow-up assessments were conducted which showed that gains made during treatment were maintained a number of months later. PP programs and assessment procedures were acceptable to most clients and attrition rates were relatively low.

The next critical steps in developing the evidence base for PP programs is for large multisite methodologically robust randomized controlled evaluations, which include economic as well as clinical outcomes, to be conducted by both the program developers and independent investigators.

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SUPPORTING INFORMATION

Additional Supporting Information may be found in the online version of this article:

Table S1. Parents Plus Suite of Programs.

Table S2. Characteristics and Key Findings of 16 Parents Plus Studies.

Table S3. Effect Sizes for Child and Adolescent Behavior Problems Assessed With the Total Difficulties Scale of the Parent-Report Version of the Strengths and Difficulties Questionnaire (Goodman, 2001).

Table S4. Effect Sizes for Goal Attainment Assessed with the Goals Scale (Sharry & Fitzpatrick, 1997).

Table S5. Effect Sizes for Parental Satisfaction Assessed with the Kansas Parental Satisfaction Scale (James et al., 1985).

Table S6. Effect Sizes for Parental Stress Assessed with the Parental Stress Index (Abidin, 1995) or the Parental Stress Scale (Berry & Jones, 1995).

Table S7. Results of Meta-Regression Moderator Analyses in Which Child and Adolescent Behavior Problems Were Assessed with the Total Difficulties Scale of the Parent-Report Version of the Strengths and Difficulties Questionnaire (Goodman, 2001).

Table S8. Results of Meta-Regression Moderator Analyses in Which Goal Attainment Was Assessed with the Goals Scale (Sharry & Fitzpatrick, 1997).

Table S9. Results of Meta-Regression Moderator Analyses in Which Parental Satisfaction Was Assessed with the Kansas Parental Satisfaction Scale (James et al., 1985).

Table S10. Results of Meta-Regression Moderator Analyses in Which Parental Stress Was Assessed with the Parental Stress Index (Abidin, 1995) or the Parental Stress Scale (Berry & Jones, 1995).

Table S1. Parents Plus suite of programs.

	Original parents Plus Program PPP	Parents Plus Early Years Program PP-EYP	Parents Plus Child Program PP-CP	Parents Plus Adolescent Program PP-AP	Working Things out program WTO	Parents Plus Parenting when Separated Program PP-PWS
Age range	4-11 years	0 –6 years	6-11 years	11-16 years	11-16 years	0-16 years
No of sessions	6-8 group sessions	6-9 group sessions	8-9 group sessions	8 group sessions	8 group sessions	6 group sessions
Session 1	<ul style="list-style-type: none"> Using parental attention to change behavior. 	<ul style="list-style-type: none"> Introduction: Tuning in to your child. Pressing the pause button when responding to misbehavior. 	<ul style="list-style-type: none"> Providing positive attention. Pressing the pause button when responding to misbehavior. 	<ul style="list-style-type: none"> Parenting teenagers. Positive communication. 	<ul style="list-style-type: none"> Getting started. 	<ul style="list-style-type: none"> Introduction: Helping parents and children cope. Impact of separation on parents. Impact of separation on children.
Session 2	<ul style="list-style-type: none"> Play and special time with children. 	<ul style="list-style-type: none"> Child-centered play and communication. Taking the lead with children. 	<ul style="list-style-type: none"> Setting aside play and special time. Using do's rather than don'ts. 	<ul style="list-style-type: none"> Getting to know your teenager. Establishing rules. 	<ul style="list-style-type: none"> How we think affects what we feel and do. 	<ul style="list-style-type: none"> Co-parenting Developing a business relationship with your child's other parent. Effective communication.
Session 3	<ul style="list-style-type: none"> Encouragement and praise 	<ul style="list-style-type: none"> Child-centered play and communication. Establishing routines using rewards and picture charts. 	<ul style="list-style-type: none"> Child-centered play. Establishing routines. 	<ul style="list-style-type: none"> Connecting with your teen. Communicating rules positively. 	<ul style="list-style-type: none"> Managing feeling down. 	<ul style="list-style-type: none"> Helping your children cope The different needs of children at different ages. Positive parenting strategies. Talking with children about separation.
Session 4	<ul style="list-style-type: none"> Using reward systems effectively. How to set rules and handle misbehavior. 	<ul style="list-style-type: none"> Encouraging and supporting your child. The 'Praise Ignore' principle. 	<ul style="list-style-type: none"> Encouragement and praise. Using consequences. 	<ul style="list-style-type: none"> Encouraging your teenager. Communicating rules positively. 	<ul style="list-style-type: none"> New ways of thinking. 	<ul style="list-style-type: none"> Being a live away or resident parent The impact of being a live away or resident parent. Managing successful contact for children.
Session 5	<ul style="list-style-type: none"> How to set rules and help children keep them. 	<ul style="list-style-type: none"> Ensure encouragement gets through. Dealing with misbehavior using consequences. 	<ul style="list-style-type: none"> Encouraging homework and learning. Using sanction systems. 	<ul style="list-style-type: none"> Listening to your teenager. Having a discipline plan. 	<ul style="list-style-type: none"> Stop and think. The key to solving problems 	<ul style="list-style-type: none"> Conflict management Remaining calm in tough situations through balanced thinking and relaxation. Managing conflict with the child's other parent.
Session 6	<ul style="list-style-type: none"> How to use active ignoring to reduce misbehavior. 	<ul style="list-style-type: none"> Helping children learn through play and reading books. Step-by-step discipline 	<ul style="list-style-type: none"> Prevention plans. Assertive parenting and dealing with disrespect. 	<ul style="list-style-type: none"> Empowering teenagers. Dealing with conflict and aggression. 	<ul style="list-style-type: none"> Dealing with anger and conflict. 	<ul style="list-style-type: none"> Coping in the long-term Personal coping in the long term. Managing new relationships and their impact on children.
Session 7	<ul style="list-style-type: none"> Using time out and other sanctions. 	<ul style="list-style-type: none"> Teaching children new tasks. Teaching children the skills to behave well. 	<ul style="list-style-type: none"> Problem-solving with children. Step-by-step discipline. 	<ul style="list-style-type: none"> Problem solving. Dealing with specific issues. 	<ul style="list-style-type: none"> Communicating well and building relationships. 	

Session 8	<ul style="list-style-type: none"> Solution building with children. 	<ul style="list-style-type: none"> Creative play activities. Solutions to specific problems and issues. 	<ul style="list-style-type: none"> Active listening and problem-solving. Dealing with special needs. 	<ul style="list-style-type: none"> Dealing with specific issues. Closing and course evaluation. 	<ul style="list-style-type: none"> Planning for the future and making positive choices,
Session 9		<ul style="list-style-type: none"> Teaching new skills using books. Parents caring for themselves. 	<ul style="list-style-type: none"> Family listening and problem solving. Parent self-care. 		
Additional sessions		<p>In clinical settings parents receive 5 additional individual sessions to coach them in skills covered in group sessions, and focus on attaining specific goals. Parent-child interaction is videoed and this is reviewed collaboratively and parents are given strengths focused feedback.</p>	<p>In clinical settings parents receive 2 additional individual sessions (which may take a conjoint family format) to coach them in skills covered in group sessions, and focus on attaining specific goals. Vulnerable parents may be offered telephone support.</p>	<p>In clinical settings two conjoint family sessions may be held after sessions 3 and 6 to address specific parent-adolescent issues and goals. Ideally the WTO program is run in parallel with the PP-AP.</p>	<p>In clinical settings two conjoint family sessions may be held after sessions 3 and 6 to address specific parent-adolescent issues and goals. Ideally the WTO program is run in parallel with the PP-AP.</p>
Special features & adaptations		<p>The Parents Together Community Course is a six week preventative version of the PP-EYP designed for delivery by frontline professionals with a two day facilitator training (Kilroy et al., 2010)</p>	<p>The program has been adapted to suit the requirements of the parents of children with intellectual disability by using some of the videos from the PPEY containing children with Special Educational Needs, and simplifying materials and using picture symbols for parents with mild intellectual disability (Hand et al., 2012).</p>		<p>The WTO DVD contains short movies with illustrated graphics, animation and music based on personal stories of 15 adolescents who have managed problems such as depression, bullying, self-harm, ADHD and anger.</p>

Table S2. Characteristics and key findings of 16 Parents Plus studies.

No.	Author	Date	Design	Follow-up	Dropouts	N per Group	No of Sessions	Setting	Child's Age	% Male Child	% Fathers	Diagnoses	Key Findings
1	PPP Behan et al.	2001	RCT	5.5m	20%	PP=26 TAU=1 4	8	CAMHS at 2 University Hospitals in Dublin	3-12 y	77	43	DBD	<ul style="list-style-type: none"> In this clinical study compared with the control group, the PP group showed a trend ($p<.09$) for greater improvement on the parent-completed SDQ total difficulties, conduct problems and hyperactivity scales, the CBCL externalizing scale and the PSI parent-child interaction scale; and significant improvement ($p<.05$) on the GS scale. On the SDQ total difficulties scale 31% of PP cases and 14% of controls showed clinically significant improvement. Compared with non-improvers, improvers had significantly higher CBCL anxiety and depression; more PSI parental distress; and less MSPSS familial social support. Gains made after treatment on the parent-completed SDQ total difficulties scale and the CBCL externalizing behavior problems scale were maintained at 5.5-months follow-up
2	Quinn Quinn et al.	2005 2007	NRCT	10 m	13%	PP=22 TAU=1 9	6	4 rural EIT clinics in South West Ireland	4-7 y	87	29	DD+ DBD	<ul style="list-style-type: none"> In this clinical study compared with the control group, the PP group showed significantly greater improvement on the parent-completed SDQ total difficulties scale. Gains made after treatment on the parent-completed SDQ total difficulties scale were maintained at 10-months follow-up. For the PP group significant improvement in goal attainment on the GS occurred from pre- to post-treatment. For the PP group there was significant improvement from pre-treatment to post-treatment and 10 month follow-up on the parent-completed SDQ conduct problems scale, parental satisfaction on the KPS, and parental stress on the QRS. Parents expressed a high level of satisfaction with the program; rated the program content and training methods highly; predicted that they would use parenting skills they had learned; and identified parental competence as the most important outcome of the program.
3	Quinn Quinn et al.	2005 2006	NRCT	10 m	17%	DBD = 17 DD = 22	6	4 rural early intervention clinics & a CAMHS clinic in South West	4-7 y	88	35	DBD DD	<ul style="list-style-type: none"> In this clinical study both groups showed significant improvement from pre-treatment to 10 months follow-up on the parent-completed SDQ total difficulties, conduct problems, emotional problems and prosocial behavior scales; and the CBCL aggressive behavior scale.

Ireland													
												<ul style="list-style-type: none"> Both groups showed significant improvement from pre-treatment to 10-months follow-up in parental satisfaction on the KPS and decreased stress on the PSI, FILE and QRS. On the parent-completed SDQ total difficulties scale more than 75% of cases showed clinically significant improvement. Parents in both groups reported high levels of satisfaction with the program On the parent-completed SDQ total difficulties scale, during the follow-up period, the DBD group showed a significantly greater improvement than the DD group. During the follow-up period, parents in the DD group showed little reduction in parental stress on the PSI, while parents in the DBD group showed a significant reduction in parental stress. During the follow-up period, parents in the DD group showed a deterioration in psychological adjustment on the GHQ-12, while parents in the DBD group showed a significant improvement. On the GS parents in the DD group reported a higher level of goal attainment compared with parents in the DBD group. 	
4	PP-EYP Sharry et al.	2005	SG	5 m	17%	PP=24	12	CAMHS at 2 University Hospitals in Dublin	2-5 y	68	29	DBD+DD	<ul style="list-style-type: none"> In this clinical study from pre to post-treatment the PP group showed significant improvement on the parent-completed SDQ total difficulties, conduct problem and hyperactivity scales; stress on the PSS; goal attainment on the GS; and ratings of positive parent-child interaction. Gains made after treatment of the SDQ and PSS were maintained at 5-months follow-up. Qualitative data showed that parents perceived their children's behavior and communication to have improved following the PP program; that they were using more positive parenting strategies; and that the quality of the parent-child relationship had improved.
5	Griffin et al.	2010 2006	NRCT	5 m	31%	PP=46 TAU=3 5	12	CAMHS at 2 University Hospitals in Dublin	3-6 y	85	-	DBD = 65% DD = 35%	<ul style="list-style-type: none"> In this clinical study compared with the control group, the PP group showed significantly greater improvement on the parent-completed SDQ total difficulties and hyperactivity scales and goal attainment on the GS. Gains made on all measures after treatment were sustained at 5-months follow-up. The PP group showed significant improvement in ratings of positive parent-child interaction. Families of children with behavior problems and developmental disorders responded equally well to treatment. In qualitative interviews with 43 parents, 47% said the group training process was the most important aspect of PP for providing support and learning new

													skills.
6	Kilroy et al.	2011	SG	0	28%	PP=29	6	Schools in Ireland Cases recruited through home-school liaison teachers and family support workers	1-9 y	66	7	BP 45% had SDQ total difficulties scores in the borderline or clinical range	<ul style="list-style-type: none"> In this community-based study from pre- to post-treatment the PP group showed significant improvement on the parent-completed SDQ total difficulties, conduct problem and hyperactivity scales and goal attainment on the GS. Greater improvement on all SDQ and GS scales occurred in cases who scored in the borderline or clinical range on the parent-completed SDQ total difficulties scale. For the whole group pre- to post-treatment goal attainment on the GS was correlated significantly with WSRF process measures of perceived progress towards goals, and optimism about progress. For the cases who scored in the borderline or clinical ranges of the parent-completed SDQ total difficulties scale, improvement on the SDQ, total difficulties scale correlated significantly with WSRF process measures of optimism about progress.
7	Gerber et al.	2015	SG	0	23%	212	7	35 community preschools	6 m-7 y	61	14	40% had SDQ total difficulties scores in the borderline or clinical range	<ul style="list-style-type: none"> In this community-based study from pre- to post-treatment the PP group showed significant improvement on parent-completed SDQ total difficulties, conduct problems, hyperactivity, emotional problem and peer problems scales. They also showed significant improvement in parental stress on the PSS, parental satisfaction on the KPS, and goals attainment on the GS. Those who scored in the borderline or clinical range on the parent-completed SDQ total difficulties scale showed greater improvement than the whole group
8	Lonergan et al.	2015	NRCT	0	2%	PP=89 WS=32	7	35 community preschools	1-7 y	55	0	None	<ul style="list-style-type: none"> In this community-based study participants who completed the 7-week PP-EYP and the half-day PP-EYP workshop showed significant improvement on the parent completed SDQ total difficulties scale and parental satisfaction on the KPS. Greater improvement occurred in the 7-week PP-EYP group than in the half-day PP-EYP workshop group. The 7-week PP-EYP group also showed significant improvement in parental stress on the PSS, and child adjustment on the parent-completed SDQ prosocial behavior scale.
9	Hayes et al.	2013	RCT	2 y	?	PP=11 3 TAU=1 66	7	Community preschools	2.5-4 y	53	8	34% had SDQ total difficulties scores in the borderline or clinical range	<ul style="list-style-type: none"> In this community-based study parents who attended more PP sessions created better home learning environments on the HLEI and actively engaged their children in play and learning activities (joint reading, playing with numbers or letters, painting, doing songs/poems/rhymes and going to the library). Neither group showed significant improvements on the SDQ, PSS or HLEI

10	Coughlan et al.	2009a 2009b	NRCT	5 m	25%	PP=42 TAU=3 2	11	4 CAMHS at 2 University Hospitals in Dublin	6-11 y	80	-	DBD=68% DD=32%	<ul style="list-style-type: none"> In this clinical study compared with the control group, the PP group showed significantly greater improvement after treatment on the parent-completed SDQ total difficulties and conduct problems scales. They also showed greater improvement in parental stress on the PSS; goal attainment on the GS, and ratings of parental confidence. Gains made after treatment were sustained at 5-months follow-up. Compared to families of children with DD and comorbid DBD, families of children with DBD only benefited more from the PP program on the parent-completed SDQ total difficulties and peer problems scales. Qualitative interviews with 21 parents showed that parents thought that the PP-CP led to their children being calmer, showing better regulation of emotions, and communicating with them more clearly. Parents said group support was the main benefit of participating in PP. Parents said the most useful skills covered in PP were advice on how to 'tune in' to their children, play with them, use planned sanctions to discipline their children, and stepping back from conflict situations.
11	Hand, NiRaghallaigh et al.	2013	RCT	0	26%	PP=16 WLC=1 3	8	School for children with mild ID	6-11 y	-	28	DD	<ul style="list-style-type: none"> In this clinical study compared with the control group, the PP group showed significant improvement on the parent-completed SDQ total difficulties, hyperactivity and conduct problems scales. The PP group also showed more improvement in parental satisfaction on the KPS, parent stress on the PSI, and goal attainment on the GS.
12	Hand, McDonnell et al.	2013	RCT	6 m	16%	PP=36 WLC=2 7	8	3 primary schools	6-11 y	-	16	None	<ul style="list-style-type: none"> In this community-based study compared with the control group, the PP group showed significant improvement on the parent-completed SDQ total difficulties and hyperactivity scales. The PP group also showed greater improvement in parental stress on the PSI, parental satisfaction on the KPS, and goal attainment on the GS. Improvements shown after treatment were maintained at 6-months follow-up.
13	PP-AP Beattie et al.	2011	NRCT	6 m	22%	PP=37 TAU=1 6	8	4 CAMHS at 2 University Hospitals in Dublin	10-17 y	64	15	DBD, ED, & DD	<ul style="list-style-type: none"> In this clinical study compared with the control group, the PP group showed significant improvement after treatment on the parent-completed SDQ total difficulties and peer problems scales. Gains made after treatment were sustained at 5-months follow-up.
14	Nitsch et al.	2015	RCT	6 m	13%	PP=70	8	Schools in	11-16 y	39	14	None	<ul style="list-style-type: none"> In this community-based study compared with the

1988). PSS = Parental Stress Scale (Berry & Jones, 1995). WSRF = Weekly Session Rating Form (Kilroy et al., 2011). HLEI = Home Learning Environment Index (Melhuish et al, 2001). FAD=McMaster Family Assessment Device (Kabacoff et al., 1985). QCCS = Quality of Co-parental Communications Scale (Ahrns, 1981). In 16 studies 887 parents engaged in PP training and 440 were in WLC or TAU control groups, with non-duplication of participants where the same cases were included in more than one study. The 22 treated cases in the Quinn et al. (2007) study were included in the Quinn et al. (2006) study as the DD group. The 212 cases in the Gerber et al. (2015) study included the 89 cases in the PP group in the Lonergan et al. (2015) study.

Table S3. Effect sizes for child and adolescent behavior problems assessed with the total difficulties scale of the parent-report version of the Strengths and Difficulties Questionnaire (Goodman, 2001).

No.	Author	Date	Group	d_{T1-T2} [95%CI]	d_{T1-T3} [95%CI]	d_{PPVC} [95% CI]
PPP						
1	Behan et al.	2001		0.74 [0.18, 1.30]	0.59 [0.03, 1.14]	0.52 [-0.13, 1.17]
2	Quinn et al.	2005, 2007		0.55 [-0.05, 1.15]	0.81 [0.20, 1.44]	0.71 [0.09, 1.33]
3	Quinn et al. ¹	2005, 2006	DBD	0.18 [-0.49, 0.85]	1.33 [0.58, 2.06]	----
Mean for PPP				0.52** [0.19, 0.86]	0.84** [0.49, 1.19]	0.62** [0.19, 1.05]
				$Q(2) = 0.417$ $I^2 = 0.00$	$Q(2) = 2.64$ $I^2 = 24.28$	$Q(1) = 0.18$ $I^2 = 0.00$
PP-EYP						
4	Sharry et al.	2005		0.68 [0.10, 1.27]	0.96 [0.35, 1.55]	----
5	Griffin et al.	2010		0.70 [0.28, 1.12]	0.77 [0.35, 1.20]	0.53 [0.18, 0.87]
6	Kilroy et al.	2011		0.61 [0.08, 1.14]	----	----
7	Gerber et al. ²	2015	All cases	0.50 [0.30, 0.69]	----	----
			Clinical cases	0.95 [0.62, 1.27]	----	----
8	Lonergan et al. ³	2015	Seven week PP-EYP	0.50 [0.20, 0.80]	----	0.29 [-0.11, 0.69]
			Half day PP WS	0.25 [-0.24, 0.74]	----	----
Mean for PP-EYP				0.52** [0.37, 0.68]	0.83*** [0.50, 1.18]	0.52*** [-0.23, 0.81]
				$Q(4) = 2.40$ $I^2 = 0.00$	$Q(1) = 0.30$ $I^2 = 0.00$	$Q(1) = 2.67$ $I^2 = 62.48$
PP-CP						
10	Coughlan et al.	2009		0.50 [0.06, 0.93]	0.71 [0.27, 1.15]	0.25 [-0.22, 0.71]
11	Hand, Ni Raghallaigh et al.	2013		1.07 [0.32, 1.81]	----	1.28 [0.61, 1.95]
12	Hand, McDonnell et al.	2013		0.45 [0.03, 0.88]	0.62 [0.19, 1.05]	0.51 [0.05, 0.97]
Mean for PP-CP				0.56*** [0.29, 0.84]	0.66*** [0.36, 0.96]	0.64*** [0.10, 1.17]
				$Q(2) = 0.31$ $I^2 = 13.57$	$Q(1) = 0.09$ $I^2 = 0.00$	$Q(2) = 6.75^*$ $I^2 = 70.38$
PP-AP						
13	Beattie et al.	2011		0.41 [-0.05, 0.87]	0.39 [-0.07, 0.85]	0.42 [-0.17, 1.01]
14	Nitsch et al.	2015		1.22 [0.86, 1.58]	1.47 [1.09, 1.84]	1.18 [0.77, 1.59]
15	Wynne et al.	2016		0.46 [0.17, 0.75]	----	----
16	Rickard et al.	2015		0.27 [-0.22, 0.76]	0.32 [-0.17, 0.82]	----
Mean for PP-AP				0.60** [0.17, 1.03]	0.74 [-0.04, 1.52]	0.83* [0.09, 1.57]
				$Q(3) = 14.97^{**}$ $I^2 = 79.96$	$Q(2) = 19.35^{***}$ $I^2 = 89.67$	$Q(1) = 4.50^*$ $I^2 = 77.76$
PP-PWS						
17	Keating et al.	2016		0.89 [0.56, 1.21]	----	0.31 [0.00, 0.62]
Mean for all programs				0.60*** [0.46, 0.74]	0.79*** [0.54, 1.03]	0.57*** [0.36, 0.79]
				$Q(15) = 25.80^*$ $I^2 = 41.87$	$Q(9) = 23.37^*$ $I^2 = 61.49$	$Q(9) = 20.91^*$ $I^2 = 56.96$

Note: No. = study number. PPP = Original Parents Plus Program. PP-EYP = Parents Plus Early Years Program. PP-CP = Parents Children's Program. PP-AP = Parents Plus Adolescent Program. PP-PWS = Parents Plus Parenting When Separated Program. DBD = Group of cases with disruptive behavior disorders. PP WS = Parents Plus half-day workshop. d_{T1-T2} = effect size reflecting change in the treated group from pre-treatment (Time 1) to post-treatment (Time 2). d_{T1-T3} = effect size reflecting change in the treated group from pre-treatment (Time 1) to follow-up (Time 3). d_{PPVC} = effect size reflecting the difference between treatment and control group after treatment (Time 2), taking account of scores of both groups before treatment (Time 1). 95%CI = 95% confidence interval. d_{T1-T2} and d_{T1-T3} effect sizes and 95% CI were computed with Wilson's (n.d.) calculator. d_{PPVC} effect sizes were computed with Lenhard & Lenhard's (2015) calculator. Q = Cochran's test of heterogeneity. I^2 = Percentage of variation across studies due to heterogeneity. A random effects model was used where Q was significant indicating significant heterogeneity. Where Q was not significant a fixed effects model was used. * $p < .05$. ** $p < .01$. *** $p < .001$.

1. To avoid duplication, only effect sizes for the DBD group from the Quinn et al. (2006) study were included in calculation of mean d_{T1-T2} and d_{T1-T3} effect sizes, and no d_{PPVC} effect sizes were calculated. Effect sizes for the DD group from the Quinn et al. (2006) study were excluded since the DD group in this study included the same cases as those in the Quinn et al. (2007) study.

2. To avoid duplication, only effect sizes for all cases from the Gerber et al. (2015) study were included in calculation of mean effect sizes. Effect sizes for the clinical cases subgroup from this study were excluded from calculation of mean effect sizes as these cases were included in the group of all cases.

3. To avoid duplication, the T1-T2 effect size for the 7 week PP-EYP group from the Lonergan et al. (2015) study was excluded from calculation of mean effect sizes as cases in this group were included in the group of all cases from the Gerber et al (2015) study.

Table S4. Effect sizes for goal attainment assessed with the Goals Scale (Sharry & Fitzpatrick, 1997).

No.	Author	Date	Group	d_{T1-T2} [95%CI]		d_{T1-T3} [95%CI]		d_{PPVC} [95% CI]	
PPP									
1	Behan et al.	2001	DBD group	0.61	[0.05, 1.16]	0.64	[0.08, 1.20]	0.74	[0.09, 1.39]
2	Quinn et al.	2005, 2007		2.58	[1.77, 3.38]	2.88	[2.04, 3.73]	----	----
3	Quinn et al. ¹	2005, 2006		1.81	[1.02, 2.62]	2.27	[1.41, 3.13]	----	----
Mean for PPP				1.64**	[0.37, 2.84]	1.90*	[0.46, 3.35]	----	----
				$Q(2) = 18.17^{***}$		$Q(2) = 23.83^{***}$		----	----
				$I^2 = 88.99$		$I^2 = 91.61$		----	----
PP-EYP									
4	Sharry et al.	2005	All cases Clinical cases	2.43	[1.68, 3.17]	----	----	----	----
5	Griffin et al.	2010		2.40	[1.86, 2.93]	----	----	1.56	[1.07, 2.05]
7	Gerber et al. ²	2015		2.37	[2.12, 2.62]	----	----	----	----
Mean for PP-EYP				2.38***	[2.17, 2.60]	----	----	----	----
				$Q(2) = 0.03$		----		----	----
				$I^2 = 0.00$		----		----	----
PP-CP									
10	Coughlan et al	2009		2.60	[2.01, 3.18]	1.76	[1.26, 2.26]	1.76	[1.24, 2.28]
11	Hand, Ní Raghallaigh et al.	2013		2.36	[1.46, 3.26]	----	----	2.20	[1.30, 3.10]
12	Hand, McDonnell et al.	2013		2.58	[2.01, 3.14]	3.01	[2.40, 3.62]	2.24	[1.64, 2.84]
Mean for PP-CP				2.55***	[2.19-2.91]	2.37***	[1.15, 3.60]	2.01***	[1.65, 2.36]
				$Q(2) = 0.29$		$Q(1) = 9.98^{**}$		$Q(2) = 1.69$	
				$I^2 = 0.00$		$I^2 = 89.98$		$I^2 = 0.00$	
PP-AP									
13	Beattie et al	2011		1.11	[0.62, 1.60]	1.34	[0.84, 1.84]	0.58	[-0.01, 1.17]
14	Nitsch et al.	2015		2.01	[1.61, 2.42]	----	----	2.02	[1.56, 2.48]
15	Wynne et al.	2016		1.33	[1.01, 1.64]	----	----	----	----
16	Rickard et al. ³	2015		0.50	[0.25, 0.75]	----	----	----	----
Mean for PP-CP				1.23*	[0.57, 1.89]	----	----	1.31*	[-0.10, 2.72]
				$Q(3) = 44.56^{***}$		----		$Q(1) = 14.79^{***}$	
				$I^2 = 93.27$		----		$I^2 = 93.24$	
PP-PWS									
17	Keating et al.	2016		1.51	[1.17, 1.86]	----	----	1.13	[0.80-1.46]
Mean for all programs				1.85*	[1.41, 2.28]	1.96***	[1.22, 2.68]	1.51*	[1.10, 1.92]
				$Q(14) = 185.06^{***}$		$Q(5) = 44.53^{***}$		$Q(7) = 34.89^{***}$	
				$I^2 = 92.98$		$I^2 = 88.77$		$I^2 = 79.93$	

Note: No. = study number. PPP = Original Parents Plus Program. PP-EYP = Parents Plus Early Years Program. PP-CP = Parents Children's Program. PP-AP = Parents Plus Adolescent Program. PP-PWS = Parents Plus Parenting When Separated Program. DBD = Group of cases with disruptive behavior disorders. Where means and standard deviations for the total goals scale were not reported, effect sizes were based on the average values for child goals and parent goals. d_{T1-T2} = effect size reflecting change in the treated group from pre-treatment (Time 1) to post-treatment (Time 2). d_{T1-T3} = effect size reflecting change in the treated group from pre-treatment (Time 1) to follow-up (Time 3). d_{PPVC} = effect size reflecting the difference between treatment and control group after treatment (Time 2), taking account of scores of both groups before treatment (Time 1). 95%CI = 95% confidence interval. d_{T1-T2} and d_{T1-T3} effect sizes and 95% CI were computed with Wilson's (n.d.) calculator. d_{PPVC} effect sizes were computed with Lenhard & Lenhard's (2015) calculator. Q = Cochran's test of heterogeneity. I^2 = Percentage of variation across studies due to heterogeneity. A random effects model was used where Q was significant indicating significant heterogeneity. Where Q was not significant a fixed effects model was used. * $p < .05$. ** $p < .01$. *** $p < .001$.

1. To avoid duplication, only effect sizes for the DBD group from the Quinn et al. (2006) study were included in calculation of mean d_{T1-T2} and d_{T1-T3} effect sizes, and no d_{PPVC} effect sizes were calculated. Effect sizes for the DD group from the Quinn et al. (2006) study were excluded since the DD group in this study included the same cases as those in the Quinn et al. (2007) study.

2. To avoid duplication, only effect sizes for all cases from the Gerber et al. (2015) study were included in calculation of mean effect sizes. Effect sizes for the clinical cases subgroup from this study were excluded from calculation of mean effect sizes as these cases were included in the group of all cases.

3. Because means and standard deviation for parent report Goals Scales were not reported in the paper, η^2_{T1-T2} effect size values were averaged and converted to Cohen's d using the table in Lenhard & Lenhard (2015).

Table S5. Effect sizes for parental satisfaction assessed with the Kansas Parental Satisfaction Scale (James et al., 1985).

No.	Author	Date	Group	d_{T1-T2} [95%CI]		d_{T1-T3} [95%CI]		d_{PPVC} [95% CI]	
PPP									
2	Quinn et al.	2005, 2007		1.02	[0.39, 1.65]	0.91	[0.29, 1.53]	0.67	[0.04, 1.30]
3	Quinn et al. ¹	2005, 2006	DBD Group	0.94	[0.23, 1.64]	0.87	[0.17, 1.57]	----	----
	Mean for PPP			0.98***	[0.53, 1.44]	0.89*	[0.44, 1.34]	----	----
				$Q(1) = 0.03$		$Q(1) = 0.01$		----	
				$I^2 = 0.00$		$I^2 = 0.00$		----	
PP-EYP									
7	Gerber et al. ²	2015	All cases	0.86	[-0.50, 2.21]	----	----	----	----
			Clinical cases	0.89	[0.57, 1.21]	----	----	----	----
8	Loneragan et al. ³	2015	Seven week PP-EYP	0.75	[0.44, 1.05]	----	----	0.32	[-0.10, 0.74]
			Half day PP WS	0.42	[-0.08, 0.91]	----	----	----	----
	Mean for PP-EYP			0.47*	[0.01, 0.93]	----	----	----	----
				$Q(1) = 0.36$		----	----	----	
				$I^2 = 0.00$		----	----	----	
PP-CP									
11	Hand, Ní Raghallaigh et al.	2013		1.72	[0.92, 2.54]	----	----	1.35	[0.58, 2.12]
12	Hand, McDonnell et al.	2013		1.35	[0.89, 1.81]	1.95	[1.45, 2.46]	1.16	[0.68, 1.64]
	Mean for PP-CP			1.44***	[1.05, 1.84]	----	----	1.21***	[0.82, 1.61]
				$Q(1) = 0.66$		----		$Q(1) = 0.18$	
				$I^2 = 0.00$		----		$I^2 = 0.00$	
PP-AP									
14	Nitsch et al. ⁴	2015		0.91	[0.56, 1.26]	0.77	[0.42, 1.11]	1.08	[0.65, 1.51]
15	Wynne et al.	2016		0.80	[0.50, 1.10]	----	----	----	----
16	Rickard et al.	2015		0.63	[0.13, 1.13]	0.56	[0.06, 1.06]	----	----
	Mean for PP-AP			0.81***	[0.60, 1.01]	0.70*	[0.42, 0.98]	----	----
				$Q(2) = 0.84$		$Q(1) = 0.48$		----	
				$I^2 = 0.00$		$I^2 = 0.00$		----	
PP-PWS									
17	Keating et al.	2016		0.37	[0.06, 0.68]	----	----	0.37	[0.04, 0.70]
	Mean for all programs			0.85***	[0.61, 1.09]	1.01*	[0.52, 1.50]	0.78***	[0.43, 1.136]
				$Q(9) = 22.44**$		$Q(4) = 19.08**$		$Q(5) = 16.90**$	
				$I^2 = 59.89$		$I^2 = 79.04$		$I^2 = 70.41$	

Note: No. = study number. PPP = Original Parents Plus Program. PP-EYP = Parents Plus Early Years Program. PP-CP = Parents Children's Program. PP-AP = Parents Plus Adolescent Program. PP-PWS = Parents Plus Parenting When Separated Program. DBD = Group of cases with disruptive behavior disorders. PP WS = Parents Plus workshop. d_{T1-T2} = effect size reflecting change in the treated group from pre-treatment (Time 1) to post-treatment (Time 2). d_{T1-T3} = effect size reflecting change in the treated group from pre-treatment (Time 1) to follow-up (Time 3). d_{PPVC} = effect size reflecting the difference between treatment and control group after treatment (Time 2), taking account of scores of both groups before treatment (Time 1). 95%CI = 95% confidence interval. d_{T1-T2} and d_{T1-T3} effect sizes and 95% CI were computed with Wilson's (n.d.) calculator. d_{PPVC} effect sizes were computed with Lenhard & Lenhard's (2015) calculator. Q = Cochran's test of heterogeneity. I^2 = Percentage of variation across studies due to heterogeneity. A random effects model was used where Q was significant indicating significant heterogeneity. Where Q was not significant a fixed effects model was used. * $p < .05$. ** $p < .01$. *** $p < .001$.

1. To avoid duplication, only effect sizes for the DBD group from the Quinn et al. (2006) study were included in calculation of mean d_{T1-T2} and d_{T1-T3} effect sizes, and no d_{PPVC} effect sizes were calculated. Effect sizes for the DD group from the Quinn et al. (2006) study were excluded since the DD group in this study included the same cases as those in the Quinn et al. (2007) study.

2. To avoid duplication, only effect sizes for all cases from the Gerber et al. (2015) study were included in calculation of mean effect sizes. Effect sizes for the clinical cases subgroup from this study were excluded from calculation of mean effect sizes as these cases were included in the group of all cases.

3. To avoid duplication, the T1-T2 effect size for the 7 week PP-EYP group from the Loneragan et al. (2015) study was excluded from calculation of mean effect sizes as cases in this group were included in the group of all cases from the Gerber et al (2015) study.

4. An incorrect SD was reported for the treatment group at time 1 (16.89) in the Tim1-Time 2 analysis. This was replaced the SD of the treatment group in the Time 1, Time 2, Time 3 analysis (3.37).

Table S6. Effect sizes for parental stress assessed with the Parental Stress Index (Abidin, 1995) or the Parental Stress Scale (Berry & Jones, 1995).

No.	Author	Date	Group	d_{T1-T2} [95%CI]		d_{T1-T3} [95%CI]		d_{PPVC} [95% CI]	
PPP									
1	Behan et al. ⁴	2001		0.43	[-0.12, 0.98]	0.27	[-0.28, 0.81]	0.15	[-0.50, 0.80]
2	Quinn et al. ^{4,5}	2005, 2007		0.40	[-0.20, 0.99]	0.25	[-0.34, 0.84]	0.34	[-0.28, 0.96]
3	Quinn et al. ^{1,4}	2005, 2006	DBD group	0.52	[-0.16, 1.20]	0.89	[0.19, 1.60]	----	----
Mean for PPP				0.44*	[0.11, 0.78]	0.42*	[-0.07, 0.75]	0.25	[-0.19, 0.68]
				$Q(2) = 0.08$		$Q(2) = 2.47$		$Q(1) = 0.18^*$	
				$I^2 = 0.00$		$I^2 = 19.15$		$I^2 = 0.00$	
PP-EYP									
4	Sharry et al.	2005		0.96	[0.36, 1.56]	0.92	[0.32, 1.51]	----	----
5	Griffin et al.	2010		0.63	[0.21, 1.04]	1.11	[0.67, 1.55]	0.38	[-0.06, 0.82]
7	Gerber et al. ²	2015	All cases	0.65	[0.46, 0.84]	----	----	----	----
			Clinical cases	0.90	[0.59, 1.22]	----	----	----	----
8	Lonergan et al. ³	2015	Seven week PP-EYP	0.62	[0.31, 0.92]	----	----	0.43	[0.01, 0.85]
			Half day PP WS	0.13	[-0.36, 0.62]	----	----	----	----
Mean for PP-EYP				0.61***	[0.46, 0.77]	1.04***	[0.70, 1.38]	0.41**	[0.11, 0.71]
				$Q(3) = 5.39$		$Q(1) = 0.27$		$Q(1) = 0.03$	
				$I^2 = 43.35$		$I^2 = 0.00$		$I^2 = 0.00$	
PP-CP									
10	Coughlan et al	2009		0.50	[0.07, 0.93]	0.84	[0.39, 1.28]	0.44	[-0.02, 0.90]
11	Hand, Ní Raghallaigh et al. ⁴	2013		0.62	[-0.09, 1.32]	----	----	0.69	[-0.04, 1.42]
12	Hand, McDonnell et al. ⁴	2013		1.60	[1.12, 2.09]	1.94	[1.44, 2.45]	0.81	[0.35, 1.27]
Mean for PP-CP				0.92*	[0.18, 1.65]	1.32***	[0.99, 1.65]	0.64***	[0.35, 0.93]
				$Q(2) = 12.36^*$		$Q(1) = 10.61^{**}$		$Q(2) = 1.31$	
				$I^2 = 83.82$		$I^2 = 90.58$		$I^2 = 0.00$	
PP-AP									
13	Beattie et al	2011		0.82	[0.34, 1.30]	0.19	[-0.27, 0.64]	0.84	[0.25, 1.43]
14	Nitsch et al. ⁴	2015		0.83	[0.49, 1.18]	0.76	[0.42, 1.11]	0.72	[0.30, 1.14]
15	Wynne et al.	2016		0.39	[0.10, 0.68]	----	----	----	----
16	Rickard et al.	2015		0.55	[0.05, 1.04]	0.33	[-0.17, 0.82]	----	----
Mean for PP-AP				0.61	[0.42, 0.79]	0.50***	[0.26, 0.73]	0.76***	[0.42, 1.10]
				$Q(3) = 4.67$		$Q(2) = 4.57$		$Q(1) = 0.11$	
				$I^2 = 35.73$		$I^2 = 56.27$		$I^2 = 0.00$	
Mean for all programs				0.64***	[0.47, 0.81]	0.75***	[1.08, 0.43]	0.54***	[0.38, 0.71]
				$Q(13) = 27.65^*$		$Q(9) = 40.60^{***}$		$Q(8) = 6.2$	
				$I^2 = 52.99$		$I^2 = 77.83$		$I^2 = 0.000$	

Note: No. = study number. PPP = Original Parents Plus Program. PP-EYP = Parents Plus Early Years Program. PP-CP = Parents Children's Program. PP-AP = Parents Plus Adolescent Program. PP-PWS = Parents Plus Parenting When Separated Program. DBD = Group of cases with disruptive behavior disorders. PP WS = Parents Plus workshop. d_{T1-T2} = effect size reflecting change in the treated group from pre-treatment (Time 1) to post-treatment (Time 2). d_{T1-T3} = effect size reflecting change in the treated group from pre-treatment (Time 1) to follow-up (Time 3). d_{PPVC} = effect size reflecting the difference between treatment and control group after treatment (Time 2), taking account of scores of both groups before treatment (Time 1). 95%CI = 95% confidence interval. d_{T1-T2} and d_{T1-T3} effect sizes and 95% CI were computed with Wilson's (n.d.) calculator. d_{PPVC} effect sizes were computed with Lenhard & Lenhard's (2015) calculator. Q = Cochran's test of heterogeneity. I^2 = Percentage of variation across studies due to heterogeneity. A random effects model was used where Q was significant indicating significant heterogeneity. Where Q was not significant a fixed effects model was used. * $p < .05$. ** $p < .01$. *** $p < .001$.

1. To avoid duplication, only effect sizes for the DBD group from the Quinn et al. (2006) study were included in calculation of mean d_{T1-T2} and d_{T1-T3} effect sizes, and no d_{PPVC} effect sizes were calculated. Effect sizes for the DD group from the Quinn et al. (2006) study were excluded since the DD group in this study included the same cases as those in the Quinn et al. (2007) study.

2. To avoid duplication, only effect sizes for all cases from the Gerber et al. (2015) study were included in calculation of mean effect sizes. Effect sizes for the clinical cases subgroup from this study were excluded from calculation of mean effect sizes as these cases were included in the group of all cases.

3. To avoid duplication, the T1-T2 effect size for the 7 week PP-EYP group from the Lonergan et al. (2015) study was excluded from calculation of mean effect sizes as cases in this group were included in the group of all cases from the Gerber et al (2015) study.

4. The Parenting Stress Index was used in these cases, whereas in all other cases the Parental Stress Scale was used.

5. PSI total scores were taken from Quinn (2005) (a doctoral thesis) as they were not reported in the Quinn et al. (2007) published paper.

Table S7. Results of meta-regression moderator analyses in which child and adolescent behavior problems were assessed with the total difficulties scale of the parent-report version of the Strengths and Difficulties Questionnaire (Goodman, 2001).

Moderator	d_{T1-T2} ($k = 15$)					d_{T1-T3} ($k = 10$)					d_{PPVC} ($k = 10$)				
	Beta	95% CI	Q [df]	p	R^2 Analog	Beta	95% CI	Q [df]	p	R^2 Analog	Beta	95% CI	Q [df]	p	R^2 Analog
Number of cases in the study	0.0004	-0.003, 0.004	0.05 [1]	0.81	0.00	0.003	-0.01, 0.01	0.22 [1]	0.64	0.00	-0.003	-0.01, 0.003	0.84 [1]	0.36	0.00
Randomization	-	-	12.37 [2]	0.002 [§]	1.00	-	-	2.32 [2]	0.31	0.14	-	-	1.74 [1]	0.19	0.00
Child's age	0.002	-0.04, 0.04	0.01 [1]	0.92	0.00	-0.01	-0.08, 0.06	0.07 [1]	0.80	0.00	0.03	-0.04, 0.10	0.83 [1]	0.36	0.00
% male children ¹	-0.001	-0.01, 0.004	1.18 [1]	0.27	0.00	-0.01	-0.02, 0.01	0.82 [1]	0.37	0.15	-0.01	-0.02, 0.01	1.64 [1]	0.20	0.22
% father involvement ²	0.001	-0.02, 0.02	0.00 [1]	0.96	0.00	0.01	-0.03, 0.05	0.19 [1]	0.66	0.00	0.004	-0.02, 0.03	0.09 [1]	0.77	0.00
Program type	-	-	0.00 [2]	1.00	0.00	-	-	0.14 [2]	0.93	0.00	-	-	1.20 [2]	0.55	0.00
Clinical status	-	-	1.34 [1]	0.25	0.00	-	-	1.80 [1]	0.18	0.14	-	-	0.61 [1]	0.44	0.00
Problem severity	-0.23	-0.07, 0.02	1.40 [1]	0.24	0.00	0.05	-0.05, 0.16	1.01 [1]	0.31	0.07	-0.02	-0.08, 0.04	0.43 [1]	0.51	0.00
Concurrent child intervention	-	-	3.58 [2]	0.17	0.03	-	-	0.48 [2]	0.79	0.00	-	-	0.61 [1]	0.44	0.00
Total number of sessions	-0.01	-0.09, 0.06	0.14 [1]	0.71	0.00	0.003	-0.12, 0.13	0.00 [1]	0.96	0.00	-0.01	-0.13, 0.11	0.03 [1]	0.85	0.00
Number of non-group family sessions	-0.03	-0.11, 0.06	0.34 [1]	0.56	0.00	0.01	-0.14, 0.16	0.02 [1]	0.89	0.00	-0.04	-0.18, 0.10	0.36 [1]	0.55	0.00
Duration of follow-up period	-0.01	-0.06, 0.03	0.24 [1]	0.63	0.00	-0.05	-0.13, 0.04	1.06 [1]	0.30	0.26	0.02	-0.05, 0.10	0.30 [1]	0.58	0.00

Note: k = Number of studies. $Beta$ = regression coefficient from meta-regression. 95%CI = 95% confidence interval for meta-regression coefficient. $Q = Q$ test for meta-regression. df = degrees of freedom. R^2 analog = Index of amount of variance accounted for by regression model. Meta-regression analyses were conducted with Comprehensive Meta Analysis Version 2 (Bornstein et al., 2005). Meta-regression analyses were not conducted where there were insufficient studies to do so or where there were collinearity problems. All moderators were treated as continuous variables except randomization, program type, clinical status, and concurrent child intervention which were treated as categorical variables, and analyzed following meta-regression procedures outlined in Bornstein et al. (2015). For randomization studies were coded as randomized, non-randomized, or single group trials. Child's age was coded as the mean child age of study completers, or an estimate of this where only age ranges were reported. % male children was coded as the percentage of male children who completed the study, or where this was unavailable, the percentage of male children who entered the study. % fathers was coded as the percentage of fathers who completed the study, or where this was unavailable, the percentage of fathers who entered the study. For program type, studies were coded as PP Early Years Programs, PP Child Program, or PP Adolescent Program; studies using the original Parents PP and the Parents PP Parenting when Separated program were omitted from analysis of this moderator. For clinical status, studies were coded as community-based studies containing non-clinical cases, or treatment studies containing clinical cases. Problem severity was indicated by the mean total difficulties score on of the parent-completed version of the Strengths and Difficulties Questionnaire (Goodman, 2001). For concurrent child intervention, studies were coded as those where there was no concurrent child intervention; those where concurrent intervention was provided by a multidisciplinary child psychiatry team; or those where adolescents engaged in the Working Things Out program. Total number of sessions was coded as the total number of group Parents Plus program sessions and additional non-group Parents Plus program sessions provided to individual families. Number of non-group family sessions was coded as 0 for studies of non-clinical cases; 5 for studies of clinical cases in the Parents Plus Early Years Program; or 2 for studies of clinical cases in the Parents Plus Child Program and Parents Plus Adolescent Program. Duration of follow-up period was coded as the number of months between program completion and follow-up assessment. * $p < .05$. ** $p < .01$. *** $p < .001$.

1. Data on % male children were not available for Hand, Ni Raghallaigh et al. (2013), Hand, McDonnell et al. (2013) and Keating et al. (2016).

2. Data on father involvement were not available for Griffin et al. (2010), Coughlan et al. (2009a), and Rickard et al. (2015).

§ For child behavior problems, the mean d_{T1-T2} effect sizes for randomized controlled trials ($d_{T1-T2} = 0.88$, $SE = 0.10$) was significantly larger than those of non-randomized controlled trials ($d_{T1-T2} = 0.55$, $SE = 0.12$) and single group studies ($d_{T1-T2} = 0.48$, $SE = 0.07$).

Table S8. Results of meta-regression moderator analyses in which goal attainment was assessed with the Goals Scale (Sharry & Fitzpatrick, 1997).

Moderator	d_{T1-T2} ($k = 14$)					d_{T1-T3} ($k = 6$)					d_{PPVC} ($k = 8$)				
	Beta	95% CI	Q [df]	p	R ² Analog	Beta	95% CI	Q [df]	p	R ² Analog	Beta	95% CI	Q [df]	p	R ² Analog
Number of cases in the study	0.003	-0.004, 0.01	0.61 [1]	0.43	0.20	0.01	-0.03, 0.05	0.13 [1]	0.71	0.00	0.0004	-0.01, 0.01	0.00 [1]	0.95	0.00
Randomization	-	-	0.71 [2]	0.70	0.00	-	-	0.11 [2]	0.95	0.00	-	-	0.49 [2]	0.48	0.00
Child's age	-0.12	-0.20, -0.03	7.43 [1]	0.01**	0.51	-0.13	-0.41, 0.16	0.75 [1]	0.39	0.00	-0.04	-0.21, 0.12	0.24 [1]	0.63	0.00
% male children ¹	0.01	-0.02, 0.04	0.43 [1]	0.51	0.00	0.06	-0.02, 0.13	2.05 [1]	0.15	0.03	-0.01	-0.05, 0.03	0.31 [1]	0.58	0.00
% father involvement ²	-0.03	0.06, 0.01	2.14 [1]	0.14	0.26	-0.04	-0.13, 0.06	0.58 [1]	0.45	0.00	-0.03	-0.08, 0.03	1.03 [1]	0.31	0.07
Program type	-	-	12.02 [2]	0.003 ^{§§}	0.66	-	-	-	-	-	-	-	1.37 [1]	0.51	0.00
Clinical status	-	-	0.00 [1]	0.96	0.00	-	-	2.34 [1]	0.13	0.33	-	-	2.40 [1]	0.12	0.00
Problem severity	-0.02	-0.16, 0.13	0.05 [1]	0.83	0.00	-0.32	-0.55, -0.10	7.77 [1]	0.01**	0.61	-0.07	-0.20, 0.06	1.06 [1]	0.30	0.00
Concurrent child intervention	-	-	5.97 [2]	0.05 ^{§§}	0.45	-	-	2.34 [1]	0.13	0.33	-	-	2.4 [1]	0.12	0.00
Total number of sessions	0.03	-0.20, 0.25	0.05 [1]	0.82	0.00	-0.17	-0.66, 0.31	0.50 [1]	0.48	0.00	0.07	-0.17, 0.30	0.31 [1]	0.58	0.00
Number of non-group family sessions	0.03	-0.23, 0.29	0.06 [1]	0.80	0.00	-0.31	-1.16, 0.53	0.53 [1]	0.47	0.00	-0.05	-0.31, 0.22	0.12 [1]	0.73	0.00
Duration of follow-up period	0.01	-0.13, 0.16	0.04 [1]	0.84	0.00	0.22	-0.12, 0.56	1.55 [1]	0.21	0.10	-0.01	-0.20, 0.17	0.02 [1]	0.90	0.00

Note: k = Number of studies. $Beta$ = regression coefficient from meta-regression. 95%CI = 95% confidence interval for meta-regression coefficient. Q = Q test for meta-regression. df = degrees of freedom. R^2 analog = Index of amount of variance accounted for by regression model. Meta-regression analyses were conducted with Comprehensive Meta Analysis Version 2 (Bornstein et al., 2005). Meta-regression analyses were not conducted where there were insufficient studies to do so or where there were collinearity problems. All moderators were treated as continuous variables except randomization, program type, clinical status, and concurrent child intervention which were treated as categorical variables, and analyzed following meta-regression procedures outlined in Bornstein et al. (2015). For randomization studies were coded as randomized, non-randomized, or single group trials. Child's age was coded as the mean child age of study completers, or an estimate of this where only age ranges were reported. % male children was coded as the percentage of male children who completed the study, or where this was unavailable, the percentage of male children who entered the study. % fathers was coded as the percentage of fathers who completed the study, or where this was unavailable, the percentage of fathers who entered the study. For program type, studies were coded as PP Early Years Programs, PP Child Program, or PP Adolescent Program; studies using the original Parents PP and the Parents PP Parenting when Separated program were omitted from analysis of this moderator. For clinical status, studies were coded as community-based studies containing non-clinical cases, or treatment studies containing clinical cases. Problem severity was indicated by the mean total difficulties score on of the parent-completed version of the Strengths and Difficulties Questionnaire (Goodman, 2001). For concurrent child intervention, studies were coded as those where there was no concurrent child intervention; those where concurrent intervention was provided by a multidisciplinary child psychiatry team; or those where adolescents engaged in the Working Things Out program. Total number of sessions was coded as the total number of group Parents Plus program sessions and additional non-group Parents Plus program sessions provided to individual families. Number of non-group family sessions was coded as 0 for studies of non-clinical cases; 5 for studies of clinical cases in the Parents Plus Early Years Program; or 2 for studies of clinical cases in the Parents Plus Child Program and Parents Plus Adolescent Program. Duration of follow-up period was coded as the number of months between program completion and follow-up assessment. * $p < .05$. ** $p < .01$. *** $p < .001$.

1. Data on % male children were not available for Hand, Ní Raghallaigh et al. (2013), Hand, McDonnell et al. (2013) and Keating et al. (2016).

2. Data on father involvement were not available for Griffin et al. (2010), Coughlan et al. (2009a), and Rickard et al. (2015).

§A mixed effects sub-group analysis of goal attainment data from the PP Early Years, Children's and Adolescents Programs showed that d_{T1-T2} effect sizes differed significantly ($Q(2) = 12.27, p < 0.01$). The mean d_{T1-T2} effect size for studies of the Children's Program ($d_{T1-T2} = 2.55, SE = 0.36$) and the PP Early Years Program ($d_{T1-T2} = 2.38, SE = 0.22$), were significantly larger than that for studies of the PP Adolescents Program ($d_{T1-T2} = 1.23, SE = 0.66$).

§§The mean goal attainment d_{T1-T2} effect size for studies in which there was no concurrent intervention ($d_{T1-T2} = 2.13, SE = 0.21$) was significantly larger than that for studies in which there was concurrent intervention ($d_{T1-T2} = 1.92, SE = 0.32$), which was significantly larger than that for studies in which adolescents attended the Working Things Out Program ($d_{T1-T2} = 0.91, SE = 0.42$).

Table S9. Results of meta-regression moderator analyses in which parental satisfaction was assessed with the Kansas Parental Satisfaction Scale (James et al., 1985).

Moderator	d_{T1-T2} ($k = 9$)					d_{T1-T3} ($k = 5$)					d_{PPVC} ($k = 6$)				
	Beta	95% CI	Q [df]	p	R^2 Analog	Beta	95% CI	Q [df]	p	R^2 Analog	Beta	95% CI	Q [df]	p	R^2 Analog
Number of cases in the study	-0.004	-0.01, 0.001	3.07 [1]	0.08	0.46	0.002	-0.02, 0.02	0.04 [1]	0.84	0.00	-0.006	-0.01, 0.00	3.80 [1]	0.05*	0.56
Randomization	-	-	0.46 [2]	0.80	0.00	-	-	0.86 [2]	0.65	0.00	-	-	1.41 [1]	0.23	0.00
Child's age	-0.03	-0.11, 0.05	0.66 [1]	0.42	0.00	-0.05	-0.19, 0.10	0.40 [1]	0.53	0.00	0.07	-0.05, 1.19	1.13 [1]	0.25	0.02
% male children ¹	0.001	-0.01, 0.01	0.06 [1]	0.80	0.00	0.001	-0.01, 0.01	0.08 [1]	0.78	0.00	-	-	-	-	-
% father involvement ²	-0.01	-0.05, 0.03	0.34 [1]	0.56	0.01	-0.02	-0.10, 0.06	0.27 [1]	0.60	0.00	0.01	-0.03, 0.04	0.12 [1]	0.73	0.00
Program type	-	-	8.00 [2]	0.02 [§]	1.00	-	-	-	-	-	-	-	-	-	-
Clinical status	-	-	0.00 [1]	0.97	0.00	-	-	0.11 [1]	0.74	0.00	-	-	0.06 [1]	0.80	0.00
Problem severity	0.03	-0.07, 0.13	0.36 [1]	0.55	0.00	0.08	-0.12, 0.30	0.45 [1]	0.50	0.00	0.07	-0.07, 0.22	0.95 [1]	0.33	0.00
Concurrent child intervention	-	-	0.56 [2]	0.75	0.00	-	-	0.94 [2]	0.62	0.00	-	-	0.06 [1]	0.80	0.00
Total number of sessions	0.02	-0.16, 0.19	0.03 [1]	0.86	0.00	-0.04	-0.41, 0.32	0.06 [1]	0.81	0.00	0.36	0.12, 0.60	8.47 [1]	0.01**	0.87
Number of non-group family sessions	-0.13	-0.44, 0.19	0.60 [1]	0.43	0.00	-0.28	-0.93, 0.36	0.75 [1]	0.39	0.00	-	-	-	-	-
Duration of follow-up period	0.02	-0.04, 0.09	0.55 [1]	0.46	0.09	-0.02	-0.38, 0.24	0.02 [1]	0.88	0.00	0.04	-0.04, 0.13	0.91 [1]	0.34	0.26

Note: k = Number of studies. $Beta$ = regression coefficient from meta-regression. 95%CI = 95% confidence interval for meta-regression coefficient. Q = Q test for meta-regression. df = degrees of freedom. R^2 analog = Index of amount of variance accounted for by regression model. Meta-regression analyses were conducted with Comprehensive Meta Analysis Version 2 (Bornstein et al., 2005). Meta-regression analyses were not conducted where there were insufficient studies to do so or where there were collinearity problems. All moderators were treated as continuous variables except randomization, program type, clinical status, and concurrent child intervention which were treated as categorical variables, and analyzed following meta-regression procedures outlined in Bornstein et al. (2015). For randomization studies were coded as randomized, non-randomized, or single group trials. Child's age was coded as the mean child age of study completers, or an estimate of this where only age ranges were reported. % male children was coded as the percentage of male children who completed the study, or where this was unavailable, the percentage of male children who entered the study. % fathers was coded as the percentage of fathers who completed the study, or where this was unavailable, the percentage of fathers who entered the study. For program type, studies were coded as PP Early Years Programs, PP Child Program, or PP Adolescent Program; studies using the original Parents PP and the Parents PP Parenting when Separated program were omitted from analysis of this moderator. For clinical status, studies were coded as community-based studies containing non-clinical cases, or treatment studies containing clinical cases. Problem severity was indicated by the mean total difficulties score on of the parent-completed version of the Strengths and Difficulties Questionnaire (Goodman, 2001). For concurrent child intervention, studies were coded as those where there was no concurrent child intervention; those where concurrent intervention was provided by a multidisciplinary child psychiatry team; or those where adolescents engaged in the Working Things Out program. Total number of sessions was coded as the total number of group Parents Plus program sessions and additional non-group Parents Plus program sessions provided to individual families. Number of non-group family sessions was coded as 0 for studies of non-clinical cases; 5 for studies of clinical cases in the Parents Plus Early Years Program; or 2 for studies of clinical cases in the Parents Plus Child Program and Parents Plus Adolescent Program. Duration of follow-up period was coded as the number of months between program completion and follow-up assessment. * $p < .05$. ** $p < .01$. *** $p < .001$.

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2. Data on father involvement were not available for Griffin et al. (2010), Coughlan et al. (2009a), and Rickard et al. (2015).

§A fixed effects sub-group analysis of parental satisfaction data from the PP Early Years, Children's and Adolescents Programs showed that effect sizes differed significantly ($Q(2) = 12.37, p < 0.01$). The mean d_{T1-T2} effect size for studies of the PP Children's Program ($d_{T1-T2} = 1.44, SE = 0.39$) was significantly greater than that for studies of the PP Adolescents Program ($d_{T1-T2} = 0.81, SE = 0.21$), which was significantly greater than that for studies of the PP Early Years Program ($d_{T1-T2} = 0.47, SE = 0.46$).

Table S10. Results of meta-regression moderator analyses in which parental stress was assessed with the Parental Stress Index (Abidin, 1995) or the Parental Stress Scale (Berry & Jones, 1995).

Moderator	d_{T1-T2} ($k = 13$)					d_{T1-T3} ($k = 10$)					d_{PPVC} ($k = 9$)				
	Beta	95% CI	Q [df]	p	R^2 Analog	Beta	95% CI	Q [df]	p	R^2 Analog	Beta	95% CI	Q [df]	p	R^2 Analog
Number of cases in the study	0.0001	-0.003, 0.003	0.00 [1]	0.96	0.00	0.008	-0.01, 0.02	1.28 [1]	0.26	0.04	0.0004	-0.005, 0.010	0.02 [1]	0.88	0.00
Randomization	-	-	3.00 [2]	0.22	0.13	-	-	1.15 [2]	0.56	0.00	-	-	1.19 [1]	0.28	0.00
Child's age	-0.005	-0.05, 0.04	0.05 [1]	0.83	0.00	-0.04	-0.12, 0.05	0.72 [1]	0.40	0.00	0.04	-0.01, 0.10	3.03 [1]	0.08	0.00
% male children ¹	-0.001	-0.01, 0.01	0.03 [1]	0.86	0.00	0.002	-0.01, 0.02	0.05 [1]	0.82	0.00	-0.01	-0.017, 0.003	1.87 [1]	0.17	0.00
% father involvement ²	-0.02	-0.04, 0.01	2.04 [1]	0.15	0.00	-0.02	-0.07, 0.03	0.77 [1]	0.38	0.00	-0.01	-0.02, 0.01	0.54 [1]	0.47	0.00
Program type	-	-	1.16 [2]	0.56	0.00	-	-	5.42 [2]	0.07	0.36	-	-	2.53 [2]	0.28	0.00
Clinical status	-	-	2.56 [1]	0.11	0.11	-	-	1.35 [1]	0.25	0.02	-	-	1.67 [1]	0.20	0.00
Problem severity	-0.02	-0.06, 0.03	0.59 [1]	0.44	0.00	-0.01	-0.16, 0.13	0.02 [1]	0.88	0.00	-0.01	-0.05, 0.02	0.32 [1]	0.60	0.00
Concurrent child intervention	-	-	3.99 [2]	0.14	0.09	-	-	10.61 [1]	0.01 ^{§**}	0.60	-	-	1.67 [1]	0.20	0.00
Total number of sessions	-0.008	-0.10, 0.09	0.03 [1]	0.86	0.00	0.05	-0.12, 0.21	0.43 [1]	0.51	0.00	-0.03	-0.11, 0.06	0.30 [1]	0.58	0.00
Number of non-group family sessions	-0.01	-0.11, 0.09	0.05 [1]	0.82	0.00	0.03	-0.16, 0.21	0.08 [1]	0.78	0.00	-0.03	-0.01, 0.06	0.41 [1]	0.52	0.00
Duration of follow-up period	0.02	-0.04, 0.07	0.36 [1]	0.54	0.00	-0.02	-0.13, 0.11	0.09 [1]	0.76	0.00	0.01	-0.05, 0.10	0.04 [1]	0.84	0.00

Note: k = Number of studies. $Beta$ = regression coefficient from meta-regression. 95%CI = 95% confidence interval for meta-regression coefficient. $Q = Q$ test for meta-regression. df = degrees of freedom. R^2 analog = Index of amount of variance accounted for by regression model. Meta-regression analyses were conducted with Comprehensive Meta Analysis Version 2 (Bornstein et al., 2005). Meta-regression analyses were not conducted where there were insufficient studies to do so or where there were collinearity problems. All moderators were treated as continuous variables except randomization, program type, clinical status, and concurrent child intervention which were treated as categorical variables, and analyzed following meta-regression procedures outlined in Bornstein et al. (2015). For randomization studies were coded as randomized, non-randomized, or single group trials. Child's age was coded as the mean child age of study completers, or an estimate of this where only age ranges were reported. % male children was coded as the percentage of male children who completed the study, or where this was unavailable, the percentage of male children who entered the study. % fathers was coded as the percentage of fathers who completed the study, or where this was unavailable, the percentage of fathers who entered the study. For program type, studies were coded as PP Early Years Programs, PP Child Program, or PP Adolescent Program; studies using the original Parents PP and the Parents PP Parenting when Separated program were omitted from analysis of this moderator. For clinical status, studies were coded as community-based studies containing non-clinical cases, or treatment studies containing clinical cases. Problem severity was indicated by the mean total difficulties score on of the parent-completed version of the Strengths and Difficulties Questionnaire (Goodman, 2001). For concurrent child intervention, studies were coded as those where there was no concurrent child intervention; those where concurrent intervention was provided by a multidisciplinary child psychiatry team; or those where adolescents engaged in the Working Things Out program. Total number of sessions was coded as the total number of group Parents Plus program sessions and additional non-group Parents Plus program sessions provided to individual families. Number of non-group family sessions was coded as 0 for studies of non-clinical cases; 5 for studies of clinical cases in the Parents Plus Early Years Program; or 2 for studies of clinical cases in the Parents Plus Child Program and Parents Plus Adolescent Program. Duration of follow-up period was coded as the number of months between program completion and follow-up assessment. * $p < .05$. ** $p < .01$. *** $p < .001$.

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2. Data on father involvement were not available for Griffin et al. (2010), Coughlan et al. (2009a), and Rickard et al. (2015).

§The mean parental stress d_{T1-T3} effect size for studies in which there was no concurrent intervention ($d_{T1-T2} = 1.94$, $SE = 0.25$) was significantly larger than those for studies in which there was concurrent intervention ($d_{T1-T2} = 0.64$, $SE = 0.15$) or where adolescents attended the Working Things Out Program ($d_{T1-T2} = 0.58$, $SE = 0.21$).