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**Author:                     Alex Piquero, David Farrington, Brandon Welsh, Richard Tremblay, & Wesley Jennings**

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## **Effects of Early Family/Parent Training Programs on Antisocial Behavior & Delinquency**

Alex R. Piquero  
University of Maryland College Park

David P. Farrington  
Cambridge University

Brandon C. Welsh  
University of Massachusetts Lowell

Richard Tremblay  
University of Montreal

Wesley G. Jennings  
University of Louisville

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## **Abstract**

Based on evidence that early antisocial behavior is a key risk factor for continued delinquency and crime throughout the life course, early family/parent training, among its many functions, has been advanced as an important intervention/prevention effort. The prevention of behavior problems is one of the many objectives of early family/parent training, and it comprises the main focus of this review. There are several theories concerning why early family/parent training may cause a reduction in child behavior problems including antisocial behavior and delinquency (and have other ancillary benefits in non-crime domains over the life course). For example, early family/parent training programs are based, in part, on the notion that quality of parent-child relations will facilitate learning of control over impulsive, oppositional, and aggressive behavior, thus reducing disruptive behavior and its long-term negative impact on social integration. Additionally, these programs attempt to change the social contingencies in the family context and/or provide advice/guidance to parents on raising their children or general parent education. Results of this review indicate that early family/parent training is an effective intervention for reducing behavior problems among young children and the weighted effect size was 0.35 approximately corresponding to 50% recidivism in the control group compared with 33% recidivism in the experimental group. The results from a series of analog to the ANOVA and weighted least squares regression models (with random effects) demonstrated that there were significant differences in the effect sizes of studies conducted in the US versus those conducted in other countries and that studies that were based on samples smaller than 100 children had larger effect sizes. Sample size was also the strongest predictor of the variation in the effect sizes.

Additional descriptive evidence indicated that early family/parent training was also effective in reducing delinquency and crime in later adolescence and adulthood. Overall, the findings lend support for the continued use of early family/parent training to prevent behavior problems such as antisocial behavior and delinquency. Future research should be designed to test the main theories of the effects of early family/parent training, more explicitly including a better articulation of the causal mechanisms by which early family/parent training reduces delinquency and crime, and future early family/parent training program evaluations should employ high quality evaluation designs with long-term follow-ups, including repeated measures of antisocial behavior, delinquency, and crime over the life course.

## **Background**

Early family/parent training programs are intended to serve many purposes, one of them being the prevention of child behavior problems including antisocial behavior and delinquency. While early family/parent training may not often be implemented with the expressed aim of preventing antisocial behavior, delinquency, and crime – sometimes these programs are aimed at more general, non-crime outcomes – its relevance to the prevention of crime has been suggested in developmentally-based criminological and psychological literatures.

## **Objectives**

The main objective of this review is to assess the available research evidence on the effects of early family/parent training on child behavior problems including antisocial behavior and delinquency. In addition to assessing the overall impact of early

family/parent training, this review will also investigate, to the extent possible, in which settings and under what conditions it is most effective.

### **Search Strategy**

Seven search strategies were employed to identify studies meeting the criteria for inclusion in this review: (1) A key word search was performed on an array of online abstract databases; (2) We reviewed the bibliographies of previous reviews of early family/parent training programs; (3) We performed forward searches for works that have cited seminal studies in this area; (4) We performed hand searches of leading journals in the field; (5) We searched the publications of several research and professional agencies; (6) After completing the above searches and reviewing previous reviews, we contacted scholars in various disciplines who are knowledgeable in the specific area of early family/parent training; and (7) We consulted with an information specialist at the outset of our review and at points along the way in order to ensure that we have used appropriate search strategies. Both published and unpublished reports were considered in the searches. Searches were international in scope.

### **Selection Criteria**

Studies that investigated the effects of early family/parent training on child behavior problems such as conduct problems, antisocial behavior and delinquency were included. Studies were only included if they had a randomized controlled evaluation design that provided before-and-after measures of child behavior problems among experimental and control subjects.

## **Data Collection & Analysis**

Narrative findings are reported for the 55 studies included in this review. A meta-analysis of all 55 of these studies was carried out. The means and standard deviations were predominantly used to measure the effect size. Results are reported for the unbiased effect sizes and the weighted effect sizes and, where possible, comparisons across outcome sources (parent reports, teacher reports, and direct observer reports). In the case of studies that measure the impact of early family/parent training on antisocial behavior and delinquency at multiple points in time, similar time periods before and after are compared (as far as possible).

## **Main Results**

The studies included in this systematic review indicate that early family/parent training is an effective intervention for reducing child behavior problems including antisocial behavior and delinquency, and that the effect of early family/parent training appears rather robust across various weighting procedures, and across context, time period, outcome source, and based on both published and unpublished data.

## **Reviewer's Conclusions**

We conclude that early family/parent training should continue to be used to prevent child behavior problems such as conduct problems, antisocial behavior, and delinquency among young persons in the first five years of life. Such programs appear to have few negative effects and some clear benefits for its subjects. It is important going forward that more stringent, experimental evaluations of early family/parent training be carried out and its outcomes assessed over the long-term (i.e., include more follow-up periods, especially follow-ups into late adolescence and into adulthood) in order to cast a

wide net with respect to the outcomes under investigation to include non-crime life domains as well, and to conduct comprehensive cost-benefit analyses of these programs.



## 1. BACKGROUND

A key observation in longitudinal studies of antisocial behavior, delinquency, and crime indicates that chronic disruptive behavior that emerges early in the life course leads to frequent and oftentimes serious delinquency and crime during childhood, adolescence, and adulthood (McCord, Widom, & Crowell, 2001; Piquero, Farrington, & Blumstein, 2003) and also produces negative reverberations in other, non-crime life domains such as education, employment, and relationship quality (Moffitt, 1993). Because of this strong linkage or cumulative continuity over the life course and across life domains, it is not surprising to learn that early prevention has been suggested as an important policy proscription with respect to early childhood problem behavior (Farrington & Welsh, 2007). And, because children exhibiting early-life behavior problems become increasingly resistant to change over the life course (Frick & Loney, 1999; Tremblay, 2000), it becomes even more important to begin such services as early in the life course as possible, as these efforts may have a larger benefit when focused on high-risk families.<sup>1</sup>

One such vehicle includes early family/parent training programs. Such programs generally postulate that improving the quality of parent-child relations, which is a key feature of early family/parent training programs, will facilitate learning of control over impulsive, oppositional, and aggressive behavior, thus reducing disruptive behavior and its long-term negative impact on social integration (Bernazzani & Tremblay, 2006:22). In practice, such interventions attempt to change the social contingencies in the family context and/or provide advice/guidance to parents on raising their children or general

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<sup>1</sup> It is the case that despite this strong cumulative continuity, most children assessed as 'antisocial' when young do not grow up into antisocial adults (Robins, 1978; Scott, 2002).

parent education (Tremblay & Craig, 1995; Hawkins et al., 1999; Kazdin et al., 1992). More specifically, a recent meta-analysis found parent training programs to be effective (see Farrington & Welsh, 2003). In comparison, other reviews on the effectiveness of home visiting programs found that the evidence on child behavior outcomes was a bit more inconclusive (see Bilukha et al., 2005; Gomby et al., 1999). Therefore, it appears that the totality of the evidence on early family/parent training programs is not entirely clear cut (Farrington & Welsh, 2007:122).

As background, we provide a brief overview of Farrington and Welsh's (2003) meta-analysis of the effectiveness of family-based crime prevention programs (carried out in several settings: home visiting programs, daycare/preschool programs, parent training programs, school-based programs, home/community programs with older adolescents, and multi-systemic therapy programs).<sup>2</sup> Specifically, these authors included in their review studies that met the following criteria: (a) the family was the focus of the intervention<sup>3</sup>, (b) there was an outcome measure of delinquency or antisocial child behavior, (c) the evaluation used a randomized experiment, and (d) the original sample size included at least fifty persons. In general, while effect sizes were generally greater in smaller scale studies, the forty studies that met their criteria had a favorable effect on child behavior problems including antisocial behavior and delinquency. (The mean effect size for all delinquency outcomes in 19 studies was .321, corresponding to a significant 16% reduction in recidivism, e.g., from 50% in the control group to 34% in the experimental group.) Additionally, the effects persisted in long-term evaluation studies.

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<sup>2</sup> It is important to note that these authors did not conduct an exhaustive review as they did not search major abstracting services such as PSYCHINFO, which would have, using general search terms, identified a great many more studies that they likely identified through their process.

<sup>3</sup> Specifically, the family and family factors were the focus of the intervention, and programs that targeted only the child were excluded from their review.

Their review also indicated that the most effective interventions employed behavioral parent training,<sup>4</sup> while the least effective were based in schools. Finally, home-visiting, day care/preschool, home/community, and multi-systemic therapy programs were generally effective.

The specific focus of the current review is on early parent training programs through age 5 (of the child) in preventing child behavior problems including antisocial behavior and delinquency. This focus permits us to compare our results to one previous review that we extend in important ways, to which we now turn our attention to.

In a systematic review of early parent training interventions designed to impact children's delinquency limited to families with a *child under age three* at the start of the intervention (but without limits concerning the child's age at the end of the intervention), Bernazzani and Tremblay (2006) identified seven studies.<sup>5</sup> Although the studies varied

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<sup>4</sup> Given the focus of the current review on parent training programs, we provide a bit more detail here with respect to Farrington and Welsh's review. Specifically, they identified ten behavioral parent training programs (programs were rather short in length and were delivered to children between ages 2 and 8, and followed until about age 9, with the one study that followed them until age 14), all of which were designed to teach parents to use rewards and punishments consistently and contingently in child-rearing. The programs were delivered in a variety of settings, though usually group but sometimes in a primary care setting or even televised. Moreover, the follow-up period was longer than one year in only one of the ten studies. The findings from these sets of studies indicated that for all but one study (the one with the longest follow-up), children who received parent training had fewer behavior problems subsequently than children in the control conditions.

<sup>5</sup> Their original starting point for identification of studies was from two previous reviews (Mrazek & Brown, 1999; Tremblay et al., 1999), and their wide search strategy included the following search terms: "parent training", "childhood", "pre-school", "delinquency", "conduct disorder", "antisocial behavior", "aggression", "physical aggression", and "behavior problems". Studies were eligible when parent training or support was a major component of the intervention, although not necessarily the only one; in fact, half of the studies had additional intervention components. Since they found only one study that assessed delinquency as an outcome – the others focused on child disruptive behavior (e.g., opposition to adults, truancy, aggression), they used a broader scope for the review and selected studies with outcome measures of disruptive behaviors (including self-, parent-, or teacher-rated measures of disruptive behaviors, and observer-rated assessments of disruptive behavior in the classroom). Only studies employing random assignment (pre- and post-intervention assessments and adequate control groups) designs were included. A total of six trials met their study inclusion criteria, and one other study was identified in the Cochrane Library and the *Future of Children* publications, thus bringing their review sample to seven total studies, all of which were randomized controlled experiments. Their review produced effect sizes, but because of the small number of studies and the presence of substantial heterogeneity among them, they did not combine them into a meta-analysis.

greatly with respect to outcome measures, child's age at evaluation, the nature and duration of the intervention and sample size, and the study's geographic location and its inclusion criteria (selective vs. universal), their analysis indicated that, overall, results concerning the effectiveness of parent training in the prevention of behavior problems in children were mixed: four studies reported no evidence of effectiveness, two reported beneficial effects, and one study reported mainly beneficial effects with some very minor harmful effects (p. 26).<sup>6</sup> Only one study in their review evaluated the effectiveness of home visitation and parent training on delinquency, and it reported very positive, crime-reduction effects (Olds et al., 1998). In short, it is still too early, from their review, to draw any definitive statement as to whether early parent training and support is effective in preventing disruptive behaviors in children and delinquency during adolescence. This is so because of the limited number of adequately designed studies, the results of the well-designed studies available are mixed and where positive often modest in magnitude, and very few studies were specifically designed to prevent disruptive behaviors in children.

With respect to parent management training, several narrative and comprehensive vote-counting reviews, as well as one meta-analysis (Serketich & Dumas, 1996) provided support that this is an effective early family-based intervention to prevent delinquency and offending. And while cost/benefit analyses have been rare, Greenwood et al. (2001) reported a benefit/cost ratio of 4:1 of the Elmira nurse home visitation program (i.e., the

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<sup>6</sup> A number of reasons could account for these findings including: the heterogeneity in the definition of parent training, the absence of evidence regarding which components of parent training are most effective, the small number of findings, the lack of consistency in outcomes (especially delinquency) assessed, which intervention components are most important, which parents are more likely to benefit from the intervention, how long it should last, and whether parent training should be combined with other intervention types (pp. 28-29).

Olds et al., 1998 study). Both Greenwood (2006) and Aos et al. (2004, 2006) have recently reported similar benefit/cost ratios for nurse home visitation programs generally, and early family/parent training programs in particular.<sup>7</sup>

To conclude this section, it is useful to repeat Farrington and Welsh's (2007:136) summary of the evaluation literature on this issue: "parent education plus daycare services and parent management training are effective in preventing delinquency and later offending. There is seemingly less consensus among evidence-based reviews on the effectiveness of parent education in the context of home visiting. Our meta-analytic review, based on four clearly defined, well-implemented, and methodologically rigorous home visitation programs, found that this form of early intervention was effective in preventing child antisocial behavior and delinquency. None of the other reviews (one a narrative review) used meta-analytic techniques to assess results, and in two of the reviews, programs other than home visiting were included. In our estimation, these differences go a long way toward explaining why these reviews found mixed results regarding the efficacy of home visiting."

## **2. REVIEW OBJECTIVES**

The objective of this systematic review is to synthesize the extant empirical evidence (published and unpublished) on the effects of early family/parent training programs implemented in early childhood in preventing child behavior problems including antisocial behavior and delinquency. The report will conform to the systematic review methodology and will incorporate meta-analytic techniques to assess results. It will build on and update (actually add and complete) the Bernazzani et al. (2001) and

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<sup>7</sup> We should also note that recent public polling data indicates that the public is willing to pay significant dollars for early-life nurse home visitation programs (Nagin, Piquero, Scott, & Steinberg, 2006).

Bernazzani and Tremblay (2006) systematic reviews of the effectiveness of early parenting training programs (for families with children up to age 3) in preventing child disruptive behavior (i.e., opposition to adults, truancy, aggression) and delinquency. Their review included parent education in the context of home visiting and parent education plus daycare.<sup>8</sup> As such, the primary question of this review is: What is the effectiveness of early family/parent training programs implemented in early childhood in reducing child behavior problems including antisocial behavior and delinquency?

This review is divided into five sections. The second section provides some background on the policy issues regarding the use of family programs to prevent crime as well as a brief overview of prior family program reviews. The third section, on research methods, reports on the criteria for inclusion of family program studies in this review and the methods used to search for evaluation studies. The fourth section reports on the key features of the studies that were included and the results of the meta-analysis. The final section provides some concluding comments and explores implications for policy and research.

## **2.1. Policy Relevance**

In recent years, there has been a marked and sustained growth in the use of family programs in many Western nations as one method of crime prevention and intervention. The Canadian province of Quebec, for example, has taken on family prevention as a key social component. Because of the importance and visibility of this social policy, we review its background in some detail below (for a further discussion see also Farrington & Welsh, 2007).

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<sup>8</sup> Further, the Bernazzani and Tremblay review was registered as a Campbell review but then deleted when they were unable to continue, so we have, in effect, re-registered this as a Campbell review.

For nearly a decade the Measurement, Methods, and Statistics Section of the National Science Foundation (NSF) and the NSF-sponsored National Consortium on Violence Research (NCOVR) have supported research on the development of a group-based method for identifying distinctive groups of individual trajectories within the population and for profiling characteristics of group members (Nagin, 2005; Nagin & Land, 1993). As applied to delinquency and crime, the use of trajectory-based methods has identified a particularly interesting group of individuals who offend at fairly high and stable rates over the life course (see review in Piquero, 2008). These offenders typically constitute a very small percentage of the population and have extraordinarily high levels of contact with the juvenile justice system, violent delinquency, and school failure. A key finding of this line of research also shows that certain risk/protective factors distinguish between trajectory groups. One set in particular emerging from Nagin and Tremblay's (2001) research using data from a sample of over 1,000 low-income males from Quebec, are boys born to mothers who were poorly educated and who began childbearing as teenagers. These risk factors were associated with a high probability of following a chronic offender trajectory. This result was key to convincing the provincial government of Quebec to initiate a multi-faceted program to support certain at-risk mothers (i.e., young mothers living in poverty). Specific objectives of the Quebec program are to improve the mother's parenting skills and to increase their use of prenatal services. At full scale, the program will be funded at the level of \$70 million annually.<sup>9</sup>

In addition to this social policy, there is some research indicating that the public does believe in prevention efforts generally, and funding these efforts at an increase to

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<sup>9</sup> The program is also now being extended to Dublin and Paris. In Dublin, the objective is to reach 200 women (within an experimental design), while the experimental program in Paris is intended to include 400 high-risk women.

taxes in particular. In one study, Nagin et al. (2006) collected data from a random sample of 2,000 Pennsylvania residents to examine their willingness to pay for an early-child/nurse-home intervention program (largely one modeled after the Olds et al. Nurse Home Partnership Program). Respondents were asked if they would be willing to pay an additional \$150 in taxes for that specific change in the law. If the respondents indicated yes to the initial question, they were asked if they would be willing to pay double, and if they said no to the original \$150 question, they were asked if they would be willing to pay \$75. They found that willingness to pay for early childhood prevention was substantial. Specifically, the average willingness to pay for the program was \$125 (65% of the respondents would be willing to pay a non-zero amount for funding the program), and a rough benefit to cost ratio yielded an estimate of 1.79, implying that the benefits of the program would exceed its costs.

In short, there has been much debate about the effectiveness of early family/parent training programs to prevent crime and hence, on the wisdom of spending large sums of money on this effort. A key issue is how far funding for these programs, especially in the United States and Canada, has been based on high quality scientific evidence demonstrating its efficacy in preventing child behavior problems including antisocial behavior and delinquency. Recent reviews of these efforts have noted the need for more and higher quality, independent evaluation studies.

## **2.2. Prior Reviews**

Prior to 2008, there have been several reviews of family prevention programs through age 3, and these include both quantitative and narrative reviews. A detailed overview of these studies and their main findings was highlighted earlier. One other



review, which used a somewhat different methodology for identifying studies than those discussed above, is also worthy of mention. Greenwood (2006) recently reviewed successful delinquency prevention programs for infants and children. Specifically, in order to identify the most promising programs, Greenwood relied on the review efforts of the Blueprints Program administered by the Center for the Study and Prevention of Violence at the University of Colorado and the review of prevention strategies and programs contained in the surgeon general's report on youth violence. His focus was on violence and delinquency outcomes.

Greenwood's review identified six promising prevention programs: (1) home visits by nurses, (2) day care and home visits, (3) multi-contextual (home visits, parent training, services), (4) preschool and home visits, (5) parent training, and (6) parent training plus other skills training and structured play. Greenwood subsequently parceled out these programs into two subcategories based on their general approach: (1) home visitation programs with/without additional services and (2) various combinations of parent training, daycare, and preschool for parents with preschool children.<sup>10</sup>

Because the six prevention programs were identified as meeting Greenwood's criteria for programs that 'work', he reached several additional conclusions. First, infancy and early-childhood programs that prevent delinquency can also prevent a number of other developmental and family problems. Second, cost-benefit assessments indicate that the programs produce important savings in future governmental expenses for

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<sup>10</sup> Greenwood also reviewed programs for elementary-school-age-children, two of which include youth aged 5-10 (FAST TRACK, which adopts social skills and parent training, home visits, tutoring, and behavior management) and 3-8 (The Incredible Years, which adopts parent training and behavior management), respectively. Greenwood identifies each as a program that 'works'.

program investment, and the benefits increase when a variety of outcomes (beyond crime) are included.

In particular, data and relevant calculations from Aos et al.'s (2001) cost-benefit analyses regarding two specific prevention programs, Nurse Family Partnership (NFP)<sup>11</sup> and Perry Preschool (PP), indicate that these two programs are somewhat costly largely because they serve each youth and family for two years and require highly trained staff (Greenwood, 2006:75). And although they do not prevent as many convictions as other efforts (and hence incur higher program costs per conviction prevented), this is likely due to the program's focus on families at high-risk for poor child outcomes, of which crime is but one feature. In fact, long-term follow-up studies show that these programs also attain a wider range of benefits that include better educational and employment outcomes, reduced alcohol/drug use, and savings with respect to healthcare and welfare costs. In short, taxpayer benefits/savings compared to cost per youth were quite high for both NFP and PP. Finally, these programs work best when they target at-risk families, especially when considering their cost-benefit estimates. More specifically, Karoly et al.'s (1998) economic analysis shows that NFP programs are not cost-effective with lower risk families and also that periods of service longer than two years do not increase long-term effects.

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<sup>11</sup> Greenwood (2006:82) notes that while the positive effects do not appear when the nurses are absent from the program implementation, NFP is being replicated in more than 60 sites and has been evaluated in three randomized trials. Expansion of the program must follow a very strict set of guidelines and protocols. Further, a competitor of NFP, Healthy Families America (HFA) is seeking to expand home visitation services in the United States.

### **2.3. Summary & Current Focus**

Across all of the reviews highlighted above, a few summary conclusions can be reached. First, most family prevention programs have been focused on either parental education (sometimes combined with daycare, other times combined with nurse home visitation) or parental management training. With respect to the family prevention programs that include home visitation, the evidence that has accumulated from the very small research base yields mixed results, though the one main experimental evaluation of a nurse home visitation program provided strong delinquency prevention benefits. With respect to parent education including daycare, the evidence is a bit more supportive of a delinquency reduction. And with respect to parent management training programs, there is some evidence about their effect on child behavior problems including antisocial behavior and delinquency, but the reviews have generated mixed findings (Serketich & Dumas, 1996) or are narrative-based (Duncan & Magnusson, 2004).

Second, there are very few family prevention programs that are carried out with strong methodological research designs, especially randomized experiments containing experimental and control groups, that contain delinquency as an outcome and that include long-term follow-ups.

Third, it is also true that several of the family prevention programs have involved multiple interventions targeted on parents (and indirectly their children). This makes it difficult to establish that it is the family-focused intervention exclusively that caused the observed program effects.

In sum, the evidence across the small number of (especially experimentally-based) studies reviewed has been mixed in general, but according to Farrington and

Welsh (2007:136) there is a trend suggesting that the programs do offer some delinquency reduction, but that there is variation within family-based prevention programs (including the lack of separating the results across the specific intervention types; Bernazzani & Tremblay, 2006). The point of departure for the current study begins with the Farrington and Welsh and Bernazzani and Tremblay reviews. Our review advances these efforts in several important ways including: (1) allowing for interventions through age 5, (2) separating the various types of interventions (parent training versus home visitation), and (3) updating the database regarding parenting prevention programs through early 2008.

### **3. Methods**

#### **3.1. Criteria for Inclusion and Exclusion of Studies in the Review**

Following the earlier Bernazzani and Tremblay (2001:92) review and the more general systematic (Campbell) reviews, the scope of this current review is randomized, controlled experimental studies including pre-post evaluations of family programs and the analysis focuses on post-test measures only. Studies lacking random assignment were excluded as they cannot help differentiate intervention effects from other effects including developmental effects. The preliminary eligibility criteria are as follows:

1. **Types of Studies:** The study must have used a randomized controlled experimental design. Studies were excluded if they only compared one version of a parent training program with another. For instance, if a study randomly assigned one group to receive parent training and another group to receive parent training and a pre-school program or if one group received individual parent training and another received group-based parent training then neither of these studies would be included in this review. Second, the study must have included at least one child-based behavioral outcome measure such as general behavior problems, antisocial behavior, delinquency, etc. Studies that focused solely on other outcomes including but not limited to academic achievement, educational attainment, and mental and/or physiological development were not included in

- this review. In this same vein, studies that targeted physically or mentally handicapped children were not included in this review either.
2. Types of Participants: The review was primarily limited to families with a child under age 5 or the mean age of the sample was approximately age 5 at the start of the intervention to ensure that the interventions were provided early in the child's life. Following from this criterion, the study also had to have measured a child behavioral outcome in this same developmental period.<sup>12</sup> In addition, selected interventions could target either the general population (universal intervention) or a high-risk group (selective intervention).
  3. Type of Intervention: Following the same terminology and criteria outlined in the Bernazzani and Tremblay review, studies were eligible for this review when parent training or support was a major component of the intervention, i.e., parent training was the central component of the intervention, although not necessarily the only one. Since it can be construed as a very general term, it is useful here to define what parent training is and is not (though this was not done in the Bernazzani and Tremblay review). There are two general subcategories that deal with prevention programs for early childhood based on their general approach (Greenwood, 2006:52). The first, home visitation, include those programs for mothers with infants, with or without additional services. According to Greenwood (2006:52), these programs "work with at-risk mothers to improve their prenatal health status, reduce birth complications, and provide guidance and support in caring for the infant and improving the quality of their own lives. Programs differ in how they identify at-risk mothers, when the home visits begin and end, who the visitors are, what the visits cover, and what other services are provided." The main goals of home visiting programs center around educating parents to improve the life chances of children from a very young age, often beginning at birth and sometimes in the final trimester of pregnancy.<sup>13</sup> According to Farrington and Welsh (2007:123), "Some of the main goals include the prevention of preterm or low-weight births, the promotion of healthy child development or school readiness, and the prevention of child abuse and neglect. Home visits very often also serve to improve parental well-being, linking parents to community resources to help with employment, educational, or addiction recovery." The second subcategory includes those programs that combine parent training, daycare, and preschool for parents with preschool children. According to Greenwood (2006:54), these programs "attempt to advance cognitive and social development of the children, as well as the parenting skills of their caregivers, so that participants will be better prepared and more successful when they enter regular school. Some programs include home visits as well." Another set of programs within this subcategory include parent management training programs

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<sup>12</sup> Although, we do recognize that it is likely that parenting interventions may have differential effects for certain types of antisocial behavior/delinquency/crime at different developmental periods, we opted not to include studies that only reported adolescent and/or adult outcomes when calculating the overall effect to not confound these outcomes with child behavior problems including antisocial behavior and childhood delinquency more generally. Yet, we still discuss these albeit important outcomes in narrative and tabular form in the results to follow.

<sup>13</sup> To be sure, some home visiting programs start prior to the third trimester, and thus operate during pregnancy.

which refer to treatment procedures in which parents are trained to alter their child's behavior at home (Farrington & Welsh, 2007:126). Many of these programs are based on Patterson's (1982) behavioral parent management training theory and policy efforts.

4. Types of Outcomes: The original aim of the review was to assess the impact of the interventions on the children's delinquent behavior. However, since only a few studies assess delinquency, we expanded the scope of our review and selected studies with outcome measures of childhood behavior problems as well.<sup>14</sup> These assessments included parent-, teacher-, and/or direct observer-rated measures of child behavior problems.<sup>15</sup>
5. Sufficient Data: The study had to provide adequate data for calculating an effect size if one was not provided (i.e., means and standard deviations, *t*-tests, *F*-tests, *p*-values, etc.) in order to calculate an effect size. Thus, studies were excluded if they did not provide sufficient data or if the results were merely reported as non-significant. In addition, studies that failed to provide any information on the sample size for either the treated or control groups for which their analysis was based on were also excluded.
6. There is no restriction to timeframe, other than we will begin with the first study identified by Bernazzani et al. (2001).
7. There are no geographic restrictions.
8. Studies needed to be published in English.

### **3.2. Search Strategy for Identification of Relevant Studies**

Several strategies were used to perform an exhaustive search for literature fitting the eligibility criteria. First, a key word search was performed on an array of online abstract databases (see lists of keywords and databases below). Second, we reviewed the bibliographies of four past reviews of early family/parent training programs (Mrazek & Brown, 1999; Tremblay, LeMarquand, & Vitaro, 1999; Bernazzani et al., 2001; Farrington & Welsh, 2007). Third, we performed forward searches for works that have

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<sup>14</sup> We recognize that there is much discussion (and confusion) with respect to the definition of antisocial behavior, delinquency, and aggression. Researchers differ in their theoretical specification and measurement operationalization of these terms generally, and then over age in particular. This, of course, makes coding these outcomes across studies over time difficult. We return to this point in the discussion section.

<sup>15</sup> We do not include outcomes based on clinical judgment, because there are very few of these studies and they are not based on random assignment. Moreover, we have not seen meta-analyses that have used clinical judgments generally, and in the parent/family-training area that we are building on, to our knowledge no one has coded/used clinical judgments. So to remain consistent with this extant literature, we do not code them.

cited seminal studies in this area.<sup>16</sup> Fourth, we performed hand searches of leading journals in the field.<sup>17</sup> Fifth, we searched the publications of several research and professional agencies (see list below). Sixth, after finishing the above searches and reviewing the studies as described later, we e-mailed the list to leading scholars knowledgeable in the specific area. These scholars were defined as those who authored two or more studies that appear on our inclusion list. These experts referred us to studies we may have missed, particularly unpublished pieces such as dissertations. Finally, we consulted with an information specialist at the outset of our review and at points along the way in order to ensure that we have used appropriate search strategies.

The following databases were searched:

1. Criminal Justice Periodical Index
2. Criminal Justice Abstracts
3. National Criminal Justice Reference Services (NCJRS) Abstracts
4. Sociological Abstracts
5. Social Science Abstracts (SocialSciAbs)
6. Social Science Citation Index
7. Dissertation Abstracts
8. Government Publications Office, Monthly Catalog (GPO Monthly)
9. PsychINFO
10. C2 SPECTR (The Campbell Collaboration Social, Psychological, Educational and Criminological Trials Register)
11. Australian Criminology Database (CINCH)
12. MEDLINE
13. Web of Knowledge
14. IBSS (International Bibliography of the Social Sciences)
15. *Future of Children* (publications)

The publications of the following groups were searched:

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<sup>16</sup> The seminal pieces used here were: Tremblay and Craig (1995); Olds et al. (1998); Bernazzani et al. (2001).

<sup>17</sup> These journals will include: *Criminology*, *Criminology and Public Policy*, *Justice Quarterly*, *Journal of Research in Crime and Delinquency*, *Journal of Criminal Justice*, *Police Quarterly*, *Policing*, *Police Practice and Research*, *British Journal of Criminology*, *Journal of Quantitative Criminology*, *Crime and Delinquency*, *Journal of Criminal Law and Criminology*, *Policing and Society*, as well as *psychology/psychiatry* journals including among others, *Child Development*.

1. Washington State Institute for Public Policy
2. Institute for Law and Justice
3. Vera Institute of Justice
4. Rand Corporation

The following agencies' publications were searched and the agencies were contacted if necessary:

1. Home Office (United Kingdom)
2. Australian Institute of Criminology
3. Swedish National Council for Crime Prevention
4. Cochrane Library
5. SAMSHA
6. Institute of Medicine
7. American Psychiatric Association
8. OJJDP (Office of Juvenile Justice & Delinquency Prevention)
9. Youth Justice Board, Department of Health and Department of Children, Schools, and Families (UK)
10. NICE (National Institute for Health and Clinical Excellence) UK
11. National Children's Bureau (which publishes 'Child Data Abstracts')

The following keywords were used to search the databases listed above:

1. "Parent Training" and "childhood" or "pre-school" and "delinquency" or "conduct disorder" or "antisocial behavior" or "aggression" or "physical aggression" or "behavior problems".
2. "Family Training" and "childhood" or "pre-school" and "delinquency" or "conduct disorder" or "antisocial behavior" or "aggression" or "physical aggression" or "behavior problems".

Several strategies were used to obtain full-text versions of the studies found through searches of the various abstract databases listed above. First, we attempted to obtain full-text versions from the electronic journals available through the John Jay/CUNY library research port as well as those from the University of Maryland and the University of Louisville. When electronic versions were not available, we used print versions of journals available at the library. If the journals were not available at the university libraries, we used the Interlibrary Loan Office (ILL) to try to obtain the printed version from the libraries of other area schools. When these methods did not work, we contacted



the author(s) of the article and/or the agency that funded the research to try to obtain a copy of the full-text version of the study.

### **3.3. Description of Methods Used in the Included Studies**

All studies included in this review were randomized controlled experiments. In all cases, the participant samples were families and children, a sample of who participated in the program and a sample who did not participate in the program. Also, all studies contained in the review included a post-program measure of childhood behavior problems (i.e., antisocial behavior, delinquency).

### **3.4. Criteria for Determination of Independent Findings**

One issue that must be confronted and dealt with in meta-analytic research is the assumption of statistical independence. It is certainly common for a lot of studies to report multiple outcomes and for the same and/or different authors to report additional findings (i.e., long-term follow-ups) for the same sample that was targeted in an earlier intervention. Relying on more than one observation (i.e., time 1, 2, 3) and/or multiple sources of observations (i.e., parent reports, teacher reports, direct observer reports) can lead to underestimating error variance and inflating significance tests (see Tabachnick & Fidell, 2001). While some meta-analytic studies in this line of research have opted to rely only on one outcome source over another for reasons such as teacher ratings are likely to be more independent of a parent/family-based intervention than parent reports and systematic “unbiased” observer ratings may be more accurate than teacher ratings (see Farrington & Welsh, 2003), other parenting intervention meta-analyses have favored averaging effect sizes (ESs) across outcome measures and outcome sources when creating an ES for each study (see McCart et al., 2006).

Some studies reported multiple findings on different outcomes and/or different samples of treated groups. In the case of independent samples, the results will be treated as separate findings and all such results will be included in the analysis. Other studies reported on several groups that received various forms of the intervention (i.e., parent training only, parent training plus a special classroom program, etc.). Our final decision here was to pool together the separate ESs into a single summary ES for each individual study because we were primarily interested in the overall effect of the early family/parent training programs on child behavior problems including antisocial behavior and delinquency in general. (Note: We do indicate that future evaluation studies parcel out and specifically focus on the effect of early family/parent training on specific child behavior problems including antisocial and delinquent behaviors).

There may certainly be some concerns regarding establishing the independence of findings. Given the potential controversial nature of a review in this area, the rules used to decide which effects to include in the various analyses require careful thought. We do not discard any outcomes. We use all the various outcome sources that are available (parent, teacher, and/or direct observer reports). We pool (average) these outcomes together to generate one effect size per study, but we also report on the effect sizes for each of these outcome sources separately. Also, when multiple measures of the same outcome exist, i.e., the Child Behavior Checklist and the Eyberg Child Behavior Inventory both measure child behavioral problems post-treatment, we pool (average) the effect size across the outcome source (i.e., one effect size generated for these two parent report instruments). When multiple comparison groups exist, i.e., parent training for one group, parent training plus a special classroom for another group) an effect size will be

calculated for each group compared to the no treatment control group and these effect sizes for the two treated groups are pooled (averaged) together.<sup>18</sup> We recognize and are sensitive to the fact that there are many ways of dealing with the independence issue, and that reasonable people may disagree with our (and others) decision criteria.

As previously mentioned, the studies that only reported long-term (i.e., adolescent/adult) outcomes were not included in generating the effect size in this study but their results are further elaborated on in the analysis that follows. Similarly, in studies that included follow-up assessments after post-treatment assessment only the post-treatment assessment was used for calculating the effect size for the study. This enhances the comparability of the studies included in this review as well as reduces the potential bias of having some studies that have short- and long-term and/or repeated assessments incorporated in the ES whereas others are only based on a post-treatment assessment. Furthermore, it is often the case that follow-up measures are only collected on the treated sample and not the control group. This is a common result of the treatment/wait-list condition nature of a majority of the studies included in this analysis where the control group (i.e., the wait list group) immediately receives the treatment after the initial post-assessment.

Similarly, the concern with statistical non-independence was also handled in the studies that used multiple sources of outcome measures such as parent reports, teacher reports, and/or direct observer reports by generating an effect size for each measure and

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<sup>18</sup> It is important to note here that another possible (and perhaps more optimal) way to pool ESs across interventions that use multiple groups who receive variations of the treatment is to average the mean and variance pooled across the treatment groups and compare this pooled mean and variance with the control group as opposed to generating independent ESs for each treatment group compared with the control group and then averaging these effect sizes. We recalculated the single study ESs using this alternative procedure and the results were substantively similar to those presented in the text.

then calculating an averaged effect size per source and then generating an average effect size across sources. For example, if parent responses were provided for the Achenbach Child Behavior Checklist (CBCL) and the Eyberg Child Behavior Inventory (ECBI) then an ES would be generated for the CBCL scores and a separate ES would be generated for the ECBI scores. The ESs of these two parent report measures would be averaged to generate one ES. Following this same logic, if the outcome measures were from multiple sources, then an ES would be estimated per source (i.e., parent report, teacher report, and/or direct observer report) and then one ES would be created by averaging across the outcome sources. Furthermore, it was relatively common for some studies to use both mother and father reports. In cases such as this, a separate ES was generated for each parent across all relevant measures and then one ES for the parent reports was generated by averaging the two ESs estimated from the parents.

### **3.5. Details of Study Coding Categories**

All eligible studies were coded (see coding protocol attached in Appendix A) on a variety of criteria (including details related to them) including:

- a. Reference information (title, authors, publication year, etc.)
- b. Nature of description of selection of sample, outcomes, etc.
- c. Nature and description of control group
- d. The unit of analysis
- e. The sample size
- f. Methodological type (i.e., randomized experiment)
- g. A description of the family/parent intervention
- h. Dosage intensity and type
- i. Implementation difficulties
- j. The statistical test(s) used
- k. Reports of statistical significance (if any)
- l. Effect size/power (if any)
- m. The conclusions drawn by the authors

Dr. Jennings independently coded each eligible study, and consulted with Dr. Piquero when questions arose in order to determine the final coding decision.<sup>19</sup>

### 3.6. Statistical Procedures and Conventions

Meta-analytic procedures were used to combine data from studies. For eligible studies (with sufficient data present) effect sizes were calculated using the standardized measures of effect sizes as suggested in the meta-analytic literature (Lipsey & Wilson, 2001). The main measure of the effect size was the standardized mean difference which computed using the following formula:

$$ES = \frac{\bar{x}_t - \bar{x}_c}{\sqrt{\frac{(n_t - 1)s_t^2 + (n_c - 1)s_c^2}{n_t + n_c - 2}}}$$

Where,  $\bar{x}_t$  is the mean of the treated/experimental group,  $\bar{x}_c$  is the mean of the control group,  $n_t$  and  $n_c$  are the sample sizes of the treatment and control groups respectively, and the portion of the formula below the square root (i.e., the denominator) is the pooled standard deviation. The majority of the studies provided the means and standard deviations necessary for calculating the ESs, however at times  $t$ -values,  $f$ -values,  $p$ -values, etc. were used to calculate effect sizes, and the Strayhorn and Weidman (1991) ES was estimated from the partial  $r$  (see Lipsey & Wilson, 2001 for derivations of formula). Effect sizes are coded such that positive effect sizes indicate treatment success and negative effect sizes indicate that the behavioral measure favored the control group (i.e., the control group scored lower on the behavioral measure compared with those in the treatment group).

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<sup>19</sup> Only one reviewer was responsible for coding all of the eligible studies.

Hedges and Olkin (1985) recommend calculating an unbiased ES that accounts for the discrepancy between the sample ES and the population ES. This occurs due to the fact that the standard deviation of the sample is subject to sampling error because it is only one estimate of the true population standard deviation. Therefore, the following formula was used to adjust for this discrepancy and the results of the unbiased standardized effect size are presented and discussed in this analysis. The  $N$  in the following formula refers to the total sample size ( $n_t + n_c = N$ ):

$$ES'_{sm} = ES_{sm} \left[ 1 - \frac{3}{4N - 9} \right]$$

In addition to Hedges and Olkin's (1985) original recommendation to estimate the unbiased ES to adjust for the influence of small sample size, we used their second proposed method (i.e., using inverse variance weights) to weight the individual ESs by their sample size. Thus, an ES of a study based on a small sample does not receive as much weight/impact on the aggregate mean ES in comparison with the ES of another study generated from a larger sample. In order to make this statistical adjustment it is first necessary to calculate the standard error (SE) of each individual effect size, which is also considered a direct index of the precision of the ES estimate, or in other words the smaller the SE, the more precise the ES. The standard error was primarily computed using the following formula where  $\overline{ES}$  represents the unbiased ES:

$$SE = \sqrt{\frac{n_t + n_c}{n_t n_c} + \frac{\overline{ES}_{sm}}{2(n_t + n_c)}}$$

Once the standard error of the unbiased ES was determined the following formula was primarily used to create the inverse variance weight:

$$w = \frac{1}{SE^2}$$

After computing the weight for each individual study it was necessary to combine all of the individual weighted ESs in order to generate the overall aggregate mean ES for the meta-analysis. This procedure relied on multiplying each ES by its corresponding inverse variance weight and then dividing the sum of the weighted ESs by the overall sum of the inverse variance weight. Therefore, the following formulae were used to calculate the overall weighted mean ES and its corresponding standard error:

$$\overline{ES} = \frac{\sum (w \times ES)}{\sum w} \qquad SE_{\overline{ES}} = \sqrt{\frac{1}{\sum w}}$$

After computing the two above statistics, we were able to use the figures in order to calculate a z-score for the mean ES and construct its corresponding confidence interval.

The following formula was used to generate the mean ES:

$$Z = \frac{\overline{ES}}{SE_{\overline{ES}}}$$

And, the formula below was used in order to construct the appropriate lower and upper bounds of the confidence interval associated with the mean ES:

$$Lower = \overline{ES} - 1.96(SE_{\overline{ES}}) \qquad Upper = \overline{ES} + 1.96(SE_{\overline{ES}})$$

Following the calculation of the weighted ES using the inverse variance weight, we examined the Q statistic that has a chi-square distribution with  $k-1$  degrees of freedom (where  $k$  is the number of ESs) to assess the heterogeneity of effect sizes across studies.

More specifically, when ESs are pooled together it is assumed that the individual ESs that are used to calculate the mean ES come from the same population. In order to investigate whether or not this was the case we calculated the Q statistic using the following formula:

$$Q = \sum (w \times ES^2) - [\sum (w \times ES)]^2 / \sum w$$

Lastly, assuming that the effect sizes are heterogeneous, we anticipated examining possible contextual or moderating features of these programs. More specifically, we looked at the ESs across different potential moderating factors such as country of publication, type of program, year of publication, outcome source, sample size, and published versus unpublished data using the analog to the ANOVA and weighted least squares regression (with random effects) estimated with Lipsey and Wilson's SPSS macros when relevant.

Finally, publication bias is a concern in every meta-analysis. As such, we use traditional methods to test for the sensitivity of the findings to publication bias in the experimental studies. These methods include a comparison of the mean effect size for published and unpublished studies and an additional examination of publication bias with a funnel plot and associated test statistics (e.g., Kendall's test and Egger's test) estimated with the 'metafunnel' macro available in Stata.

### **3.7. Treatment of Qualitative Research**

Qualitative studies were not included in the current review.

### **3.8. How Study Quality will be Assessed**

Although we recognize that assessing study quality can be both an objective and a subjective exercise, we attempt to assess the quality of the studies in terms of research



design, sample bias, and attrition bias, and make notation of study quality at various points in the review.

## **4. RESULTS**

### **4.1. Literature Search**

As mentioned previously we used a variety of mechanisms for trying to locate studies that may be relevant for the meta-analysis. The preliminary key word searches across the numerous computer databases and government/agency websites, forward and backward searches of relevant literature reviews and previous meta-analyses, hand searches through key identified journals, and email/phone contacts with leading scholars in the subject area produced over 4,000 hits.

Next, after a substantial number of duplicate sources and sources not available in the English language were removed, potentially relevant titles and abstracts were examined and studies were removed if not applicable, and verification was made after retrieving the entire article that the intervention was in fact early family/parent training, these results yielded 166 studies. These studies were analyzed carefully according to the inclusion criteria described previously and 87 of these studies were excluded for not meeting the inclusion criteria for either lacking random assignment, targeting mostly older children and/or adolescents (i.e., over mean age 5), focusing on developmentally disabled children, or failing to report any child outcome behavioral data or enough information to calculate an ES.

Table 4.1 lists these evaluations, summarizes their key features, and identifies the reason(s) for exclusion. The practice of displaying and describing the excluded studies is common in systematic reviews in order to allow readers to determine for themselves the

findings of those excluded studies compared with those included. A brief examination of the results displayed in Table 4.1 indicates that the overwhelming majority of the studies found that early family/parent training was effective for reducing a host of childhood and adolescent behavior problems; however, much credence cannot be given to these results given the drastic differences in sample size, methodology, targeted age groups for intervention, and/or lacking random assignment or an adequate control group, or in some cases not including a control group at all.

**Table 4.1. Early Family/Parent Training Program Evaluations NOT MEETING Inclusion Criteria**

<i>Author, Publication Date</i>	<i>Location</i>	<i>Reason for Not Including Program</i>	<i>Intervention</i>	<i>Sample Size</i>	<i>Targeted Age(s)</i>	<i>Results</i>
Achenbach et al. (1993)	Vermont USA	Not enough information provided	Home visits	E=24 <sup>a</sup> C=31	Birth	Reduction in child behavior problems
Anastopolous et al. (1993)	USA	Targeted children 6-11 years old	Parent Training	E=19 C=15	6-11 year olds	Reductions in hyperactivity
Battistich et al. (1996)	USA	Targeted children third through sixth grade	Parent Training	E=2,438 C=2,331	Third-sixth grade children (≈8-11 year olds)	Reductions in drug use and delinquency
Bernal et al. (1980)	USA	Targeted children 5-12 years old	Parent Training	N=36	5-12 year olds	Parent reports showed reductions in child behavior problems; Direct observer reports did not show significant reductions in child behavior problems
Brightman et al. (1982)	USA	Developmentally disabled children	Parent Training	E=53 C=13	3-13 year olds	Reductions in child behavior problems
Brody & Forehand (1985)	USA	No control group	Parent Training	E=12 C=12	NR <sup>a</sup>	Similar reductions in child behavior problems for youth in maritally distressed and nondistressed families
Catalano et al. (1999)	Seattle, Washington USA	Targeted children 3-14 years old	Parent training Home visits	E=75 C=55	3-14 year olds	Fewer intervention youth reported using cigarettes, alcohol, and marijuana

<p>CPPRG<sup>b</sup> (1999; 2000; 2002); Lochman &amp; CPPRG (1995); Nix et al. (2005); Rabiner et al. (2000); Stormshak et al. (2000)</p>	<p>North Carolina; Tennessee; Pennsylvania; Washington</p> <p>USA</p>	<p>Intervention not begun until first grade</p>	<p>Parent Training Home visits</p>	<p>E=445 C=446</p>	<p>First graders (≈6 year olds)</p>	<p>Reductions in child behavior problems; Screening assessments predicted behavior problems; physically aggressive parenting linked to child aggression</p>
<p>Dadds &amp; McHugh (1992)</p>	<p>Queensland, Australia</p>	<p>No control group</p>	<p>Parent Training</p>	<p>E=11 C=11</p>	<p>≈4-5 year olds</p>	<p>Reductions in child deviance for both parent training groups</p>
<p>Dadds et al. (1987)</p>	<p>Queensland, Australia</p>	<p>No control group</p>	<p>Parent Training</p>	<p>E=12 C=12</p>	<p>≈4-5 year olds</p>	<p>Reductions in child deviance for all parent training groups except for martially-distressed child management training only group</p>
<p>Danforth et al. (2006)</p>	<p>USA</p>	<p>No control group</p>	<p>Parent Training</p>	<p>E=49</p>	<p>4-12 year olds</p>	<p>Reductions in hyperactivity, defiance, and aggressive behavior</p>
<p>Davis &amp; Spurr (1998)</p>	<p>South East London</p> <p>United Kingdom</p>	<p>No random assignment</p>	<p>Parent Training</p>	<p>E=55 C=38</p>	<p>Pre-school children ≈4 year olds</p>	
<p>Delaney (1997)*</p>	<p>USA</p>	<p>No control group</p>	<p>Parent Training</p>	<p>E=4</p>	<p>≈3 year olds</p>	<p>Reductions in child behavior problems</p>
<p>Dumas (1984)</p>	<p>Knoxville, Tennessee</p> <p>USA</p>	<p>No control group</p>	<p>Parent Training</p>	<p>E=52</p>	<p>2-11 year olds</p>	<p>Program failures were rated as being more aversive than program successes</p>

Eddy et al. (2003)	USA	Intervention not begun until fourth/fifth grade	Parent Training	E=214 C=147	Fourth/Fifth graders ≈9-10 year olds	Onset of police arrest and alcohol use in the middle school year (i.e., ≈12-14 years old) was less likely for intervention youth
Eisenstadt et al. (1993)	USA	No control group	Parent Training	E=24	2-7 year olds	Reduction in child behavior problems for those who received parent training before child training
Emond et al. (2002)	Bristol United Kingdom	No child behavioral outcome measures	Home visits	E=1,280 C=1,159	Birth	No developmental differences in mental development
Eron et al. (2002)	Chicago and Aurora, Illinois USA	Intervention not begun until second/third grade or fifth/sixth grade	Parent Training	8 Birth Cohorts from 4 schools N=4,471	Second/Third or Fifth/Sixth Graders ≈7-12 year olds	Reduction in aggression scores
Forehand et al. (1981)	Georgia USA	No control group	Parent Training	E=46	3-9 year olds	Reduction in child behavior problems
Gordon et al. (1979)	USA	No control group	Parent Training	E=12	2-10 year olds	Improvements on a bipolar adjective checklist
Gray & Klaus (1970)	USA	No child behavioral outcome measures	Parent Training	N=88	Pre-school children ≈4 year olds	Higher scores on intelligence tests
Greene et al. (2004)	USA	No control group	Parent Training	E=50	4-12 year olds	Parent training and collaborative problem solving reduced behavior problems

Gunderson (2003)*	Utah USA	No control group	Parent Training	E=21	4-5 year olds	Reduction in child behavior problems
Han et al. (2005)	USA	No random assignment	Parent Training	E=83 C=66	4-5 year olds	
Hartman et al. (2003)	USA	No control group	Parent Training	E=83	Mean age=61.20 months	Reduction in child behavior problems
Hawes & Dadds (2005)	Brisbane and Sydney, Australia	No control group	Parent Training	E=56	4-8 year olds	Reduction in antisocial, anxiety, callous-emotional traits, hyperactivity, and oppositional defiant disorder problems
Heifetz (1977)	USA	Developmentally handicapped children	Parent Training	E=165	2-14 year olds	Reduction in child behavior problems
Henry (1987)	USA	No control group	Parent Training	E=6	4-11 year olds	Reduction in child behavior problems
Ho et al. (1999)	Hong Kong, China	No control group	Parent Training	E=25	4-10 year olds	Reduction in child behavior problems
Hourihan & Hoban (2004)	Australia	No control group	Parent Training	E=33 families	Pre-school children	Reduction in child behavior problems
Huang et al. (2003)	Taiwan	No control group	Parent Training	E=23	3-6 year olds	Reduction in child behavior problems
Hutchings et al. (2004)	United Kingdom	Targeted children 2-10 years old  No control group	Parent Training	E=42	2-10 year olds	Reduction in child behavior problems

Hutchings et al. (2007a)	United Kingdom	No control group; pilot study	Parent Training	E=9	7-11 years old	Reduction in child behavior problems
Ireland et al. (2003)	Australia	No control group	Parent Training	E=37	2-5 years old	Reduction in child behavior problems; no differences between standard and enhanced parent training
Irvine et al. (1999)	Oregon USA	Targeted middle school kids	Parent Training	E=151 C=152	Mean age=12.2 years old	Reduction in child antisocial behavior problems
Johnston et al. (2004)	Pacific Northwest USA	No child behavioral outcome measures	Parent Training	E=550 C=121	Birth	Mothers were less depressed and more likely to continue breastfeeding and reading to their infant
Karoly & Rosenthal (1977)	USA	Targeted children 3-14 years old	Parent Training	E=9 E=8	3-14 year olds	Reduction in child behavior problems
King et al. (1998)	Australia	Targeted children 5-15 years old	Parent Training	E=17 C=17	5-15 year olds	Increased school attendance and reductions in behavior problems
Knapp & Deluty (1989)	USA	No control group	Parent Training	E=49	3-8 year olds	Middle-socioeconomic mothers reported greater reduction in behavior problems than did lower socioeconomic status mothers
Lally et al. (1988).	Syracuse, New York USA	No random assignment	Parent Training Home visits	E=108 C=74	Birth	Less delinquency than a matched comparison sample of adolescents
Long et al. (1994)	USA	No random assignment	Parent Training	E=26 C=26	2-7 year olds	No differences in behavior problems between intervention youth and a community sample of youth

Magen & Rose (1994)	USA	Targeted children 5-11 years old	Parent Training	E=37 C=19	5-11 year olds	Reduction in child behavior problems; Parent training in behavioral skills was more effective than parent training in problem solving
McClowery et al. (2005)	USA	Targeted children 5-9 years old	Parent Training	E=91 C=57	5-9 year olds	Reduction in child behavior problems; most effective among children who were at diagnostic levels of disruptive behavior problems
McCord et al. (1978)	Cambridge, Massachusetts USA	Targeted children 5-13 years old	Parent Training Home visits	E=253 C=253	5-13 year olds	At 30-year follow-up, intervention group was more likely to have committed at least a second crime and evidence signs of alcoholism
McGoey et al. (2005)	Northeast USA	No control group	Parent Training	E=30 C=27	Pre-school; Kindergarteners; ≈4-5 year olds	Mixed effects on child behavioral outcomes
McNamara et al. (1994)	Ohio USA	No control group	Parent Training	E=121	4-5 year olds	Center-based treatment children were rated as having fewer behavior problems compared with home-based children
McNeil et al. (2002)	USA	No control group	Parent Training	E=4	3-8 year olds	Reduction in child behavior problems
Mullin et al. (1994)	Ireland	Targeted children with a mean of age 7	Parent Training	E=39 C=40	Mean age=7 years old	Reduction in child behavior problems
Myers (1996)	USA	No control group	Parent Training	E=6	4-7 year olds	Reduction in child behavior problems



Myers et al. (1992)	Los Angeles, California USA	Targeted children in first/second grade	Parent Training	E=109 C=64	≈6-7 year olds	Reduction in child behavior problems
Nilsen (2007)	USA	Targeted children 5-12 years old	Parent Training	E=11 C=7	5-12 year olds	Reduction in child behavior problems
Owens et al. (2005)	USA	Targeted kindergarten through sixth graders	Parent Training	E=30 C=12	Kindergarten through sixth grade children; ≈5-11year olds	Reductions in hyperactive and impulsive and oppositional or defiant and aggressive behavior
Peters et al. (2003)	Ontario, Canada	Not enough information provided	Parent Training	E=255 C=299	Junior Kindergarten ≈4 year olds	Reduction in child behavior problems
Pevsner (1982)	Ft. Lauderdale, Florida USA	No control group	Parent Training	E=16	5-13 year olds	Reduction in child behavior problems for group and individual parent training
Plant & Sanders (2007)	Queensland, Australia	Developmentally disabled children	Parent Training	E=50 C=24	4-5 year olds	Reduction in child behavior problems for both standard and enhanced parent training programs
Rabin et al. (1991)	New York USA	No child behavioral outcome measures	Center-based pre/post natal care Parent Training	E=498 C=91	Birth	Less maternal and infant morbidity

Ramey et al. (1985)	North Carolina USA	Developmentally disabled children No child behavioral outcomes	Parent Training	E=42 C=23	Infants	Intense parent training produced gains in mental development scores
Sanders et al. (2004)	Queensland, Australia	No control group	Parent Training	E=98	2-7 year olds	Standard and enhanced parent training reduced child behavior problems
Scaife & Frith (1988)	United Kingdom	No control group	Parent Training	E=6	Preschool children ≈4 year olds	Reduction in child behavior problems
Scarr & McCartney (1988) <sup>20</sup>	Bermuda	Only behavioral measure is infant behavior record	Home visits	E=78 C=39	2 year olds	Rated less deviant in behavioral development
Scholar et al. (2006)	Tennessee USA	No child behavioral outcomes reported No control group	Parent Training	E=65	6-18 month olds	Parent training helped parents manage their aggression
Seitz et al. (1985)	Northeastern city USA	No random assignment	Home visits	E=18 C=18	Birth	
Sheeber (1991)*	Portland, Oregon and Gainesville, Florida USA	No control group	Parent Training	E=40	2-6 year olds	Reduction in child behavior problems

<sup>20</sup> Although Bernazzani et al.'s (2001) original meta-analysis included Scarr and McCartney (1988), we opted to exclude this study since the only child outcome measure was the Infant Behavior Record (Bayley, 1969) which predominantly measures infant developmental milestones, motor skills, and behaviors such as activity and energy.

Singh et al. (2007)	USA	Developmentally disabled children  No control group	Parent Training	E=4	2-6 year olds	Reduction in child behavior problems
Smith et al. (2000)	Los Angeles, California  USA	Developmentally disabled children  No control group	Parent Training	E=28	18-42 months old	Mixed results for intensive versus standard parent training reducing child behavior problems
Smolkowski et al. (2005)	Oregon  USA	Targeted kindergarten through third graders	Parent Training	E=162 C=165	≈5-8 year olds	Mixed results; reductions in antisocial and coercive behavior
Strain & Timm (2001)	Tennessee  USA	No control group	Parent Training	E=69	≈36 months old	Reduction in child behavioral problems; the younger children performed best in treatment; as adults the intervention youth were well-adjusted, competent, and happy
Thomas et al. (1982)	South Glamorgan  United Kingdom	No control group	Parent Training	E=53 health visitor reports	Pre-school children ≈4 year olds	Little to no improvement in child behavior problems for the majority of children
Tolan et al. (2004)	Chicago, Illinois  USA	Intervention not begun until first grade	Parent Training	N=424	≈6 year olds	Reduction of child behavior problems for high-risk children

Tremblay et al. (1995)	Montreal Quebec, Canada	Children were age 7 when treatment was initiated	Parent Training	N=319	≈7 year olds	Reduction in teacher rated disruptiveness at ages 10-15; less self-reported delinquency; no significant differences in likelihood of having a juvenile court record
Van den Hoofdakker (2007)	Netherlands	Targeted children 4-12 years old	Parent Training	E=47 C=47	4-12 year olds	Reduction in child behavior problems
Wade et al. (2007)	New York USA	No control group	Parent Training	E=5	3-6 year olds	Reduction in bedtime and daytime behavior problems
Webster-Stratton (1985a)	USA	No control group	Parent Training	E=35	3-8 year olds	Reductions in child behavior problems; reduction in behavioral problems were maintained in father-involved families
Webster-Stratton (1985b)	USA	No control group	Parent Training	E=34	3-8 year olds	Reduction in child behavior problems
Webster-Stratton (1990a)	USA	No control group	Parent Training	E=171 mother and fathers	3-7 year olds	Reduction in child behavior problems
Webster-Stratton (1994)	USA	No control group	Parent Training	E=78	3-8 year olds	Reduction in child behavior problems for standard and enhanced parent training programs
Webster-Stratton & Hammond (1998)	Seattle, Washington USA	No control group	Parent Training	E=426	4 year olds	Increase in the number of risk factors from normal to “non-pervasive” to “pervasive” groups

Wells & Egan (1988)	USA	No control group	Parent Training	E=19 families	3-8 year olds	Reduction in child behavior problems; social learning-based parent training superior to systems family therapy
Werba et al. (2006)	USA	No control group	Parent Training	E=99 families	3-6 year olds	Treatment completers showed greater reduction in child behavior problems versus dropouts
Wolfe et al. (1988)	Canada	No control group	Parent Training	E=30	9-60 months old	Reduction in child behavior problems; reductions maintained for group who received parent training and information sessions
Yockelson (1999)*	Oregon, USA	No control group	Parent Training	E=4 dyads	2-6 year olds	Reduction in child behavior problems

<sup>a</sup> E = Experimental; C = Control

<sup>b</sup>CPPRG=Conduct Problems Prevention Research Group

\*unpublished data

Thus, 79 studies remained after the initial exclusion criteria were analyzed. Next, these remaining studies were further examined in order to address the issue of independence. In other words, it was necessary to exclude studies that were based on the same sample that previous author(s) had already reported on. Twenty-five of these 79 studies were determined to be based on the same sample of one of the included studies and these supplemental (i.e., non-independent studies) were excluded from this meta-analysis (Baydar et al., 2003; Bor et al., 2002; Brooks-Gunn et al., 1994; Cullen & Cullen, 1996; Farnworth et al., 1985; Fergusson, 2005a; Foster et al., 2007; Gross et al., 1995; Hutchings et al., 2007b; Johnson, 2006; Johnson & Walker, 1987; Jones et al., 2007; McCormick et al., 2006; Olds et al., 2002, 2004, 2007; Reid et al., 2001, 2004; Schweinhart, 2007; Schweinhart & Xiang, 2003; Schweinhart et al., 1985; Tucker et al., 1998). Additionally, two studies (Olds et al., 1998; Reynolds et al., 2001) only provided data on adolescent/adult outcomes and were not included in the meta-analysis; however given the high profile of these studies, it is important to note here that Farrington and Welsh (2003) provided a recent meta-analysis examining the effects of early family/parent training on adolescent and adult outcomes of these two excluded studies and found an ES of 0.54 for Olds et al. (1998), and 0.28 for Reynolds et al. (2001). Furthermore, an additional reason for not including these studies was the fact that the outcomes in these two studies were based on official data (i.e., arrests), whereas the outcomes in all of the 55 included studies were based on self-report instruments (i.e., parent, teacher, and/or direct observer reports). Thus, the final sample of studies used in this meta-analysis was 55 studies.

## 4.2. Characteristics of Studies Included in Meta-Analysis

As mentioned previously after the rigorous assessment of all studies, 55 studies were determined to meet all of the criteria for inclusion and the analysis that follows now focuses on these particular studies. Table 4.2 below describes the author(s), the date of publication, the location of the intervention, the type of the intervention, the original sample size of the treatment and control groups and the targeted age(s) of the early family/parent training intervention. The majority of the interventions were carried out in the United States (n=38), followed by Australia (n=7), the United Kingdom (n=5), Canada (n=2), the Netherlands (n=1), New Zealand (n=1), and China (n=1). Similarly, the majority of the studies were based on published data (n=51), however, there were four interventions that met the inclusion criteria that were from unpublished data. Three of the four unpublished studies were dissertations (Fanning, 2007; Tucker, 1996; Tulloch, 1996); and another was a paper that has yet to have been published (Kim et al., 2007). Based on the selection criteria described previously, all of the interventions were randomized controlled experiments. Most of the interventions (n=47) could be broadly classified as parent training programs although some of these studies might have also included home visits (e.g., Abbott-Shimm et al., 2003; Johnson & Breckenridge, 1982; Schweinhart et al., 1993; Songua-Barke et al., 2001), whereas eight of the studies were considered home visitation programs as defined by Greenwood (2006) (i.e., the Olds et al., 1998 research design for example) (Butz et al., 2001; Cullen, 1976; Fergusson et al., 2005b; Heinecke et al., 2001; Kitzman et al., 1997; McCarton et al., 1997; Olds, Robinson, Pettitt et al., 2004; Stone et al., 1988). The majority of the studies were considered small sample studies, with 37 of the studies being based on samples of less

than 100 children. The studies covered more than a thirty-year time span, with the earliest study published in 1976 (Cullen, 1976) and the most recent study published in 2008 (Hiscock et al., 2008). On average, the studies were published in 1997.



**Table 4.2. Early Family/Parent Training Program Evaluations MEETING Inclusion Criteria**

<i>Author, Publication Date</i>	<i>Location</i>	<i>Type of Intervention</i>	<i>Time of Study</i>	<i>Original Sample Size<sup>a</sup></i>	<i>Targeted Age(s)</i>
Abbott-Shim et al. (2003)	Southern Urban Setting  USA	Parent Training	1998-1999	E=87 C=86	4 year olds
Barkley et al. (2000)	Worcester, Massachusetts  USA	Parent Training	1991-1996	E=79 C=42	Kindergarteners ≈5 year olds
Bradley et al. (2003)	Metropolitan Toronto  Canada	Parent Training	1998	E=119 C=109	3-4 year olds
Brestan et al. (1997)	USA	Parent-Child Interaction Therapy Parent Training	NR <sup>b</sup>	E=14 C=16	Mean age= 4.54 years
Butz et al. (2001)	Two Urban Hospitals  USA	Home Visits	1994-1997	E=59 C=58	Birth
Connell et al. (1997)	Rural South East Queensland  Australia	Parent Training	NR	E=12 C=12	2-6 year olds
Cullen (1976)	Australia	Home Visits	1964-1967	E=124 C=122	1 year olds

Cunningham et al. (1995)	Hamilton Schools USA	Parent Training	1991-1993	E=94 C=56	Junior Kindergarten ≈4 year olds
Edwards et al. (2007)	North and Mid Wales	Incredible Years Parenting Program Parent Training	NR	E=86 C=47	3-4 year olds
Eyberg et al. (1995)	United Kingdom USA	Parent-Child Interaction Therapy Parent Training	NR	E=19 C=8	3-6 year olds
Fanning (2007)*	USA	Parent Training	2005-2006	E=14 C=14	3-5 year olds
Feinfield & Baker (2004)	Los Angeles, California  USA	Parent Training	NR	E=24 C=23	4-8 year olds
Fergusson et al. (2005b)	Christchurch  New Zealand	Home Visits	2000-2001	E=220 C=223	Birth
Gardner et al. (2006)	Oxford  United Kingdom	Incredible Years Parenting Program Parent Training	NR	E=44 C=32	2-9 year olds
Hamilton & MacQuiddy (1984)	USA	Parent Training	NR	E=18 C=9	2-7year olds
Heinicke et al. (2001)	Los Angeles, California  USA	Home Visits	NR	E=31 C=33	Birth

Helfenbaum & Ortiz (2007)	New York City, New York  USA	Incredible Years Parenting Program Parent Training	NR	E=23 C=16	3-5 year olds
Hiscock et al. (2008)	Melbourne, Victoria  Australia	Parent Training	2004	E=329 C=404	6-7 month olds
Johnson & Breckenridge (1982)	Houston, Texas  USA	Parent Training	1970	E=214 C=244	1 year olds
Kim et al. (2007)*	First-Generation Korean Americans  USA	Incredible Years Parenting Program Parent Training	2003-2004	E=20 C=9	3-8 year olds
Kitzman et al. (1997)	Memphis, TN  USA	Home Visits	1990-1991	E=681 C=458	Birth
Leung et al. (2003)	Hong Kong,  China	Triple P Parenting Program Parent Training	2001	E=74 C=17	3-7 year old
Markie-Dadds & Sanders (2006)	Australia	Triple P Parenting Program Parent Training	NR	E=32 C=31	2-5 year olds
McCarton et al. (1997)	USA	Home Visits	1984-1985	E=377 C=608	Birth

McNeil et al. (1991)	USA	Parent-Child Interaction Therapy Parent Training	NR	E=10 C=10	2-7 year olds
Morawska & Sanders (2006)	Brisbane, Queensland  Australia	Triple P Parenting Program Parent Training	NR	E=85 C=41	Mean age=26.10 months
Nicholson et al. (1998)	USA	Parent Training	NR	E=20 C=20	1-5 year olds
Nicholson et al. (2002)	Large Urban Midwestern city  USA	Parent Training	NR	E=13 C=13	1-5 year olds
Olds, Robinson, Pettitt et al. (2004)	Denver, Colorado  USA	Home Visits	1994-1995	E=480 C=255	Birth
Patterson et al. (2002)	Oxford  United Kingdom	Incredible Years Parenting Program Parent Training	NR	E=60 C=56	2-8 year olds
Reid et al. (2007)	Seattle, Washington  USA	Incredible Years Parenting Program Parent Training	NR	E=89 C=97	Kindergarteners ≈5 year olds
Sandy & Boardman (2000)	New York, New York  USA	Parent Training	1997-1999	N=404	2-6 year olds

Sanders, Markie-Dadds et al. (2000a)	Brisbane, Australia	Triple P Parenting Program Parent Training	NR	E=228 C=77	3-4 year olds
Sanders, Montgomery et al. (2000b)	Metropolitan city Australia	Triple P Parenting Program Parent Training	NR	E=28 E=28	2-8 year olds
Schuhmann et al. (1998)	USA	Parent-Child Interaction Therapy Parent Training	NR	E=37 C=27	3-6 year olds
Schweinhart et al. (1993)	Ypsilanti, Michigan USA	Parent Training	1958-1962	E=58 C=65	3-4 year olds
Scott et al. (2001)	South London United Kingdom	Incredible Years Parenting Program Parent Training	1995-1999	E=90 C=51	3-8 year olds
Shaw et al. (2006)	Pittsburgh, Pennsylvania USA	Parent Training	2001	E=60 C=60	2 year olds
Sonuga-Barke et al. (2001)	Southampton United Kingdom	Parent Training	1992-1993	E=58 C=20	3 year olds
Strayhorn & Weidman (1991)	USA	Parent Training	1987-1988	E=50 C=48	3-4 year olds
Stone et al. (1988)	USA	Home Visits	1977-1980	E=90 C=60	Birth

Taylor et al. (1998)	Ontario, Canada	Incredible Years Parenting Program and Eclectic Parent Training	NR	E=92 C=18	3-8 year olds
Tucker (1996)*	USA	Incredible Years Parenting Program Parent Training	NR	E=12 C=12	2-3 year olds
Tulloch (1997)*	Bronx and Queens, New York  USA	Parent Training	NR	E=20 C=7	3-5 year olds
Van Zeijl et al. (2006)	Western region  Netherlands	Parent Training	2001-2002	E=120 C=117	1-3 year olds
Webster-Stratton (1982)	USA	Incredible Years Parenting Program Parent Training	NR	E=16 C=19	3-5 year olds
Webster-Stratton (1984)	USA	Incredible Years Parenting Program Parent Training	NR	E=24 C=11	3-8 year olds
Webster-Stratton et al. (1988)	USA	Incredible Years Parenting Program Parent Training	NR	E=85 C=29	3-8 year olds
Webster-Stratton (1990a)	USA	Incredible Years Parenting Program Parent Training	NR	E=31 C=14	3-8 year olds

Webster-Stratton (1992)	USA	Incredible Years Parenting Program Parent Training	NR	E=59 C=41	3-8 year olds
Webster-Stratton & Hammond (1997)	USA	Incredible Years Parenting Program Parent Training	NR	E=55 C=22	4-8 year olds
Webster-Stratton (1998)	USA	Incredible Years Parenting Program Parent Training	NR	E=345 C=167	Pre-school children ≈4 year olds
Webster-Stratton et al. (2001)	USA	Incredible Years Parenting Program Parent Training	NR	E=191 C=81	4 year olds
Webster-Stratton et al. (2004)	Seattle, Washington USA	Incredible Years Parenting Program Parent Training	1995-1997	E=80 C=26	4-8 year olds
Zangwill (1983)	USA	Parent-Child Interaction Therapy Parent Training	NR	E=8 C=7	2-8 year olds

Note. Group sample sizes that did not receive parenting intervention or were not in the control group are not reported in the figures above.

<sup>a</sup> E = Experimental; C = Control

<sup>b</sup> NR = Not Reported

\*unpublished data

### **4.3. Types of Early Family/Parent Training Interventions**

Although we do not have space in this review to provide a detailed study-by-study description of all the features and components of the early family/parent training intervention used, we will briefly elaborate on a few of the most well-known/recognizable types of interventions. As mentioned previously the majority of the studies included in this meta-analysis used some type of parent training program. These parent training programs typically involved either individual or group-based parent training sessions that were conducted in a clinic, the school, or some other type of community-based site and the main parenting intervention programs were the Incredible Years Parenting Program, the Triple P-Positive Parenting Program, and Parent-Child Interaction Therapy.

Certainly the most internationally recognizable parent training program that was used in a number of the studies in this meta-analysis is Webster-Stratton's Incredible Years Parenting Program (Edwards et al., 2007; Gardner et al., 2006; Helfenbaum & Ortiz, 2007; Kim et al., 2007; Patterson et al., 2002; Reid et al., 2007; Scott et al., 2001; Taylor et al., 1998; Tucker, 1996; Webster-Stratton, 1982, 1984, 1990b, 1992, 1998; Webster-Stratton & Hammond, 1997; Webster-Stratton et al., 1988, 2001, 2004). There are a variety of abbreviated and age-appropriate versions of the program, yet the main purpose of the program is to provide parent training to strengthen the parent's competencies in monitoring and appropriately disciplining their child's behaviors along with increasing the parent's overall involvement in the child's school experiences to promote the child's social and emotional competence and reduce their conduct problems. This intervention is typically provided by trained experts and/or through the use of parent



training videotapes. The intervention sessions are provided in the home, the school, or at the clinic and can be offered as individual or group parent training.

Five of the studies included in this meta-analysis incorporated the Triple P-Positive Parenting Program (Leung et al., 2003; Markie-Dadds & Sanders, 2006; Morawska & Sanders, Sanders et al., 2000a, 2000b). As originally developed by Sanders et al. (1999), the Triple P-Positive Parenting Program is a comprehensive, multi-level, prevention program that attempts to introduce and train parents to use positive and nonviolent techniques when trying to manage their child's behavior. The program is typically administered at five different levels depending on the severity of the child's behavioral problems. Level 1 is aimed at providing universal parenting information disseminated through the media/videotapes. Level 2 involves one or two sessions with a healthcare provider to offer guidance and advice to parent of children with behavior problems. Level 3 is a four-session parent training program that targets children with mild to moderate behavior problems, and Level 4 is considered a more intensive program for children with serious behavior problems and is typically comprised of eight to ten parenting sessions. Finally, Level 5 is an enhanced program provided for families that have a host of issues including serious child behavior problems (Sanders, 1999; Leung et al., 2003).

Parent-Child Interaction Therapy (PCIT) (Eyberg & Durning, 1994; Hembree-Kigin & McNeil, 1995) was another type of early family/parent training program that was rather common (Brestan et al., 1997; Eyberg et al., 1995; McNeil et al., 1991; Schuhmann et al., 1998; Zangwill et al., 1993) in this meta-analysis. PCIT is a parent training program that is designed to foster a caring and responsive relationship between

the parent and their child as well as training the child to behave appropriately. The intervention program is typically organized in two phases: (1) child-directed interaction and (2) parent-directed interaction. The goal of the child-directed interaction phase is to modify and enhance the quality of the parent-child relationship, and the parent-directed interaction phase focuses on training the parents how to properly reward child compliance and punish noncompliance. The PCIT program is usually provided by therapists and the therapists train the parents through instruction, modeling, and various role playing techniques (Eyberg et al., 1995).

Comparatively, the home visitation studies (as described previously) typically involved health professionals such as nurses, doctors, or paraprofessionals that visited the mothers and gave them advice about how to effectively manage their child's behavior. All of the early family/parent training interventions (as defined) in these studies began prior to childbirth or early on during infancy (Butz et al., 2001; Cullen, 1976; Fergusson et al., 2005b; Heinicke et al., 2001; Kitzman et al., 1997; McCarton et al., 1997; Olds, Robinson, Pettitt et al., 1997; Stone et al., 1988).

#### **4.4. Quality Assessment**

Whenever possible, it is important to assess the quality of studies included in a meta-analysis. One of the main determinants of study quality is the research design. Due to the nature of the inclusion criteria, all of the studies included in this review can be considered of high quality insofar as they all used a randomized controlled experiment to evaluate the effectiveness of early family/parent training and virtually all of the studies reported the comparable demographics of the treated and controls groups prior to the intervention. However, very few studies provided any detail on whether or not the

randomization process was compromised to any extent throughout the course of the intervention or if attrition had any differential effects for the experimental group compared with the control group. Thus, it is possible that some group imbalances might have arisen by chance, particularly given the small sample in a number of the studies.<sup>21</sup> In addition, it was rare for the studies to provide any information on the comparability of how the groups were treated throughout the course of the intervention by those who administered the intervention.

#### **4.5. Measures Used for Calculating Effect Sizes**

All of the studies included in this meta-analysis relied on self-report data for their measured child behavioral outcomes and the majority of the studies used parent reports (n=52), followed by direct observer reports (n=16), and/or teacher reports (n=14). As can be seen in Table 4.3, the most widely used instruments for measuring the child behavioral outcomes were the Achenbach Child Behavioral Checklist (CBCL) (Achenbach & Edelbrock, 1983) and the Eyberg Child Behavior Inventory (ECBI) (Eyberg & Robinson, 1983). A description of the self-report instruments used by the majority of the studies included in the meta-analysis is described below.

*CBCL:* The CBCL and its revised age-appropriate versions contains a number of items related to children's behavioral and emotional problems and often includes an index of total problems, and subscales of internalizing and externalizing problems that include constructs such as withdrawal, anxiety/depression, social problems, attention problems, aggression, and delinquent behavior (Achenbach & Edelbrock, 1983). The CBCL is predominantly used as a parent reporting instrument, however there is also a

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<sup>21</sup> The sample sizes of the studies in this review ranged from a low of n=11 (Zangwill, 1983) to a high of n=870 (McCarton et al., 1997). On average the sample size was n=137 (SD=184.15), and a little over a third of the studies had sample sizes less than n=50, and 10% of the studies had samples > n=25.

teacher-based version (Achenbach & Edelbrock, 1986) and a direct observer-based version (Achenbach, 1986) that are also used in some of the studies included in the meta-analysis as indicated in Table 4.3.

*ECBI/SESBI*: The Eyberg Child Behavior Inventory (ECBI) (Eyberg & Robinson, 1983) is a parent-based self report measure that assesses behavior using two scales, the Problem Scale and the Intensity Scale. The Problem Scale measures how many behavioral problems that the parents endorse their children as having (i.e., a prevalence of particular behavior problems) and the Intensity Scale measures the frequency of the occurrence of these same behavior problems. The Sutter-Eyberg Student Behavior Inventory (SESBI) is the teacher report complement to the ECBI and yields comparable Problem and Intensity scores (Funderburk & Eyberg, 1989).

*HSQ/SSQ*: The Homes Situations Questionnaire (HSQ) (Barkley, 1990) is a parent self-report questionnaire that assesses the pervasiveness and severity of behavior problems across 16 different home and public settings as rated on a Likert scale ranging from 1 to 9. There are typically two scores related to this measure that are frequently reported, a number of problem settings (i.e., frequency of behavior problems) and a severity index (mean severity score). The School Situations Questionnaire (SSQ) (Barkley, 1990) is the teacher-based version of the HSQ and contains the same items as those included in the parent-based version.

*SSRS*: The Social Skills Rating Scale (SSRS) (Gresham & Elliot, 1990) is a standardized and normed teacher-completed scale that is used to assess child behavior problems as well as social skills and social competence. There is a behavior problems subscale.

*PDR*: The Parent Daily Report (PDR) (Chamberlain & Reid, 1987) is a checklist of child behavior problems that are rated by parents and two scores are frequently used. One score is the sum of all of the occurrences of behavior problems on a given day and the second score is the sum of all behaviors that have been identified by the parent as a problem.

*SDQ*: The Strength and Difficulties Questionnaire (SDQ) (Goodman, 1999) is a parent-report behavioral screening questionnaire that has a series of subscales that measure emotional problems, conduct problems, inattention/hyperactivity problems, peer problems, and prosocial behavior.

*ECI*: The Early Childhood Inventory (ECI) (Gadow & Sprafkin, 1994) is a parent checklist of behavioral problems and contains a conduct problems subscale.

*Conner's Teacher Rating Scale*: The Conner's Teacher Rating Scale (Conners, 1969) helps to identify hyperactive and conduct disordered children by asking teachers the degree to which a child exhibits a series of listed symptoms and a total score can be derived as well as a conduct disorder subscale.

*PBQ*: The Preschool Behavior Questionnaire (PBQ) (Behar & Stringfield, 1974) is a modified version of Rutter's (1967) Children's Behavior Questionnaire. This instrument is predominantly used as a teacher-report instrument, but it has also been used as a parent-report instrument (Bradley et al., 2003). The measure has a hostile/aggressive subscale.

*BAI*: The Behavior Assessment Interview (BAI), as used in Johnson and Breckenridge (1982), is an adaptation of MacFarlane et al.'s (1954) BAI which provides

scores for various behavior problems according to a 3-point Likert scale system (similar to the CBCL).

*Problem Behavior Index:* The Problem Behavior Index is a parent-based measure derived from the Family and Children's Experiences Survey (FACES) Parent Interview (Administration on Children, Youth, and Families, 1997).

*Behavior Screening Questionnaire:* The Behavior Screening Questionnaire (Richman & Graham, 1971) was developed to identify emotional and behavioral problems in children and measures constructs such as aggression using a 4-point Likert scale ranging from "never/almost never" to "always/almost always".

*SCBE:* The Social Competence Behavior Evaluation (SCBE) (Lafreniere et al., 1992) is a teacher-report questionnaire that is used to assess social competence, emotional regulation and expression, and adjustment difficulties in children and has an externalizing subscale that is highly correlated with the CBCL.

*PACS:* The Parent Account of Child Symptoms (PACS) (Taylor et al. 1991) is a measure derived from parent interviews that is used to assess conduct and hyperactivity problems in children and there is a conduct problems subscale.

*TASB:* The Teacher Assessment of School Behavior (TASB) (Cassidy & Asher, 1992) is a teacher-report measure of child behavior problems and includes an aggressive behavior subscale.

*PCSC:* The Perceived Competence Scale for Young Children (PCSC) (Harter & Pike, 1984) is a teacher-report measure that assesses a host of behavioral problems in children and it includes a behavior conduct subscale.

*SHP*: The Social Health Profile (SHP) is a revised version of the Teacher Observation of Classroom Adaptation questionnaire (Werthamer-Larsson et al., 1990) and measures various behavior problems such as fighting, breaking the rules, harming others, etc.

*PBI*: The Pupil Behavior Inventory (PBI) is a teacher-report measure and consists of a series of items that measure child behavior and misconduct problems such as cheating, swearing, stealing, influencing others toward trouble making, etc. (Vinter et al., 1966).

**Table 4.3. Meta-Analysis of Early Family/Parent Training Studies: Outcome Measures and Data Sources with References**

<i>Author, Publication Date</i>	<i>Outcome Measure</i>	<i>Data Source<sup>a</sup></i>
Abbott-Shim et al. (2003)	Problem Behavior Index—Administration on Children, Youth and Families (1997)	T
Barkley et al. (2000)	Child Behavior Checklist (CBCL)—Achenbach & Edelbrock (1983) Home Situations Questionnaire (HSQ)—Barkley (1990) School Situations Questionnaire (SSQ)—Barkley (1990) Social Skills Rating System (SSRS)—Gresham & Elliot (1990) Direct Observer Rating	P, T, DO
Bradley et al. (2003)	Preschool Behavior Questionnaire (PBQ)—Behar & Stringfield (1967)	P
Brestan et al. (1997)	Eyberg Child Behavior Inventory (ECBI)—Eyberg & Robinson (1983)	P (M, F)
Butz et al. (2001)	Child Behavior Checklist (CBCL)—Achenbach & Edelbrock (1983)	P
Connell et al. (1997)	Eyberg Child Behavior Inventory (ECBI)—Eyberg & Robinson (1983) Parent Daily Report (PDR)—Chamberlain & Reid (1987)	P (M, F)
Cullen (1976)	Hitting Others	P
Cunningham et al. (1995)	Home Situations Questionnaire (HSQ)—Barkley (1990) Direct Observer Rating	P, DO
Edwards et al. (2007)	Eyberg Child Behavior Inventory (ECBI)—Eyberg & Robinson (1983)	P
Eyberg et al. (1995)	Eyberg Child Behavior Inventory (ECBI)—Eyberg & Robinson (1983) Direct Observer Ratings	P
Fanning (2007)	Early Childhood Inventory (ECI-4)—(Gadcow & Sprafkin, 1994) Parent Daily Report (PDR)—Chamberlain & Reid (1987)	P
Feinfield & Baker (2004)	Child Behavior Checklist (CBCL)—Achenbach & Edelbrock (1983) Home Situations Questionnaire (HSQ)—Barkley (1990)	P



Fergusson et al. (2005b)	Child Behavior Checklist (CBCL)—Achenbach & Edelbrock (1983)	P
Gardner et al. (2006)	Eyberg Child Behavior Inventory (ECBI)—Eyberg & Robinson (1983) Direct Observer Ratings	P, DO
Hamilton & MacQuiddy (1984)	Eyberg Child Behavior Inventory (ECBI)—Eyberg & Robinson (1983)	P
Heinicke et al. (2001)	Child Behavior Checklist (CBCL)—Achenbach & Edelbrock (1983)	P
Helfenbaum & Ortiz (2007)	Eyberg Child Behavior Inventory (ECBI)—Eyberg & Robinson (1983)	P (F)
Hiscock et al. (2008)	Child Behavior Checklist (CBCL)—Achenbach & Edelbrock (1983)	P
Johnson & Breckenridge (1982)	Behavior Assessment Interview (BAI)—MacFarlane et al. (1954)	P
Kim et al. (2007)	Eyberg Child Behavior Inventory (ECBI)—Eyberg & Robinson (1983)	P
Kitzman et al. (1997)	Child Behavior Checklist (CBCL)—Achenbach & Edelbrock (1983)	P
Leung et al. (2003)	Parent Daily Report (PDR)—Chamberlain & Reid (1987) Eyberg Child Behavior Inventory (ECBI)—Eyberg & Robinson (1983) Strength and Difficulties Questionnaire (SDQ)—Goodman (1999)	P
Markie-Dadds & Sanders (2006)	Eyberg Child Behavior Inventory (ECBI)—Eyberg & Robinson (1983) Parent Daily Report (PDR)—Chamberlain & Reid (1987)	P
McCarton et al. (1997)	Child Behavior Checklist (CBCL)—Achenbach & Edelbrock (1983)	P
McNeil et al. (1991)	Revised Conner's Teacher Rating Scale (RCTRS)—Conners (1969) Sutter-Eyberg Student Behavior Inventory (SESBI)—Funderburk & Eyberg (1989)	T
Morawska & Sanders (2006)	Eyberg Child Behavior Inventory (ECBI)—Eyberg & Robinson (1983)	P (M, F)
Nicholson et al. (1998)	Behavior Screening Questionnaire—Richman & Graham (1971)	P
Nicholson et al. (2002)	Eyberg Child Behavior Inventory (ECBI)—Eyberg & Robinson (1983) Direct Observer Ratings	P, DO

Olds, Robinson, Pettitt et al. (2004)	Child Behavior Checklist (CBCL)—Achenbach & Edelbrock (1983)	P
Patterson et al. (2002)	Eyberg Child Behavior Inventory (ECBI)—Eyberg & Robinson (1983) Strength and Difficulties Questionnaire (SDQ)—Goodman (1999)	P
Reid et al. (2007)	Child Behavior Checklist (CBCL)—Achenbach & Edelbrock (1983) Social Competence and Behavior Evaluation (SCBE)—Lafreniere et al. (1992) Direct Observer Ratings	P, T, DO
Sandy & Boardman (2000)	Child Behavior Checklist (CBCL)—Achenbach & Edelbrock (1983)	P
Sanders, Markie-Dadds et al. (2000a)	Eyberg Child Behavior Inventory (ECBI)—Eyberg & Robinson (1983) Parent Daily Report (PDR)—Chamberlain & Reid (1987) Direct Observer Ratings	P (M, F), DO
Sanders, Montgomery et al. (2000b)	Eyberg Child Behavior Inventory (ECBI)—Eyberg & Robinson (1983)	P
Schuhmann et al. (1998)	Eyberg Child Behavior Inventory (ECBI)—Eyberg & Robinson (1983)	P (M, F)
Schweinhart et al. (1993)	Pupil Behavior Inventory (PBI)—Vinter et al. (1966)	T
Scott et al. (2001)	Child Behavior Checklist (CBCL)—Achenbach & Edelbrock (1983) Parent Daily Report (PDR)—Chamberlain & Reid (1987) Strength and Difficulties Questionnaire (SDQ)—Goodman (1999) Parent Account of Child Symptoms (PACS)—Taylor et al. (1991)	P
Shaw et al. (2006)	Child Behavior Checklist (CBCL)—Achenbach & Edelbrock (1983)	P
Sonuga-Barke et al. (2001)	Parent Account of Childhood Symptoms (PACS)—Taylor et al. (1991)	P
Strayhorn & Weidman (1991)	Behar Preschool Behavior Questionnaire (Behar, 1977)	P, T
Stone et al. (1988)	Eyberg Child Behavior Inventory (ECBI)—Eyberg & Robinson (1983) Direct Observer Ratings	P, DO

Taylor et al. (1998)	Child Behavior Checklist (CBCL)—Achenbach & Edelbrock (1983) Eyberg Child Behavior Inventory (ECBI)—Eyberg & Robinson (1983) Parent Daily Report (PDR)—Chamberlain & Reid (1987)	P, T
Tucker (1996)	Eyberg Child Behavior Inventory (ECBI)—Eyberg & Robinson (1983)	P (M, F)
Tulloch (1997)	Conner’s Conduct Problems Revised (CPRS-R)—Goyette et al. (1978) Preschool Behavior Checklist (PBCL)—Behar & Stringfield (1984)	P
Van Zeijl et al. (2006)	Child Behavior Checklist (CBCL)—Achenbach & Edelbrock (1983)	P
Webster-Stratton (1982)	Eyberg Child Behavior Inventory (ECBI)—Eyberg & Robinson (1983) Direct Observer Ratings	P, DO
Webster-Stratton (1984)	Eyberg Child Behavior Inventory (ECBI)—Eyberg & Robinson (1983) Child Behavior Checklist (CBCL)—Achenbach & Edelbrock (1983) Parent Daily Report (PDR)—Chamberlain & Reid (1987) Direct Observer Ratings	P, DO
Webster-Stratton et al. (1988)	Eyberg Child Behavior Inventory (ECBI)—Eyberg & Robinson (1983) Child Behavior Checklist (CBCL)—Achenbach & Edelbrock (1983) Parent Daily Report (PDR)—Chamberlain & Reid (1987) Preschool Behavior Questionnaire (PBQ)—Behar & Stringfield (1967) Direct Observer Ratings	P (M, F), T, DO
Webster-Stratton (1990b)	Eyberg Child Behavior Inventory (ECBI)—Eyberg & Robinson (1983) Child Behavior Checklist (CBCL)—Achenbach & Edelbrock (1983) Parent Daily Report (PDR)—Chamberlain & Reid (1987) Direct Observer Ratings	P (M, F), DO
Webster-Stratton (1992)	Eyberg Child Behavior Inventory (ECBI)—Eyberg & Robinson (1983) Child Behavior Checklist (CBCL)—Achenbach & Edelbrock (1983) Parent Daily Report (PDR)—Chamberlain & Reid (1987) Preschool Behavior Questionnaire (PBQ)—Behar & Stringfield (1967) Direct Observer Ratings	P (M, F), T, DO

Webster-Stratton & Hammond (1997)	Eyberg Child Behavior Inventory (ECBI)—Eyberg & Robinson (1983) Child Behavior Checklist (CBCL)—Achenbach & Edelbrock (1983) Parent Daily Report (PDR)—Chamberlain & Reid (1987) Preschool Behavior Questionnaire (PBQ)—Behar & Stringfield (1967) Direct Observer Ratings	P (M, F), T, DO
Webster-Stratton (1998)	Eyberg Child Behavior Inventory (ECBI)—Eyberg & Robinson (1983) Child Behavior Checklist (CBCL)—Achenbach & Edelbrock (1983) Direct Observer Ratings	P, T, DO
Webster-Stratton et al. (2001)	Eyberg Child Behavior Inventory (ECBI)—Eyberg & Robinson (1983) Child Behavior Checklist (CBCL)—Achenbach & Edelbrock (1983) Social Competence Behavior Evaluation (SCBE)—Lafreniere et al. (1992) Social Health Profile (SHP)—Werthamer-Larsson et al. (1990) Direct Observer Ratings	P, T, DO
Webster-Stratton et al. (2004)	Eyberg Child Behavior Inventory (ECBI)—Eyberg & Robinson (1983) Social Health Profile (SHP)—Werthamer-Larsson et al. (1990) Perceived Competence Scale for Young Children (PCSC)—Harter & Pike (1984) Teacher Assessment of School Behavior (TASB)—Cassidy & Asher (1992) Direct Observer Ratings	P (M, F), T, DO <sup>22</sup>
Zangwill (1983)	Eyberg Child Behavior Inventory (ECBI)—Eyberg & Robinson (1983) Direct Observer Ratings	P, DO

<sup>a</sup> P = Parent report, T = Teacher report, DO = direct observer report, M = mother report, F = father report).

<sup>22</sup> In Webster-Stratton et al. (2004) the direct observer reports in the home and in the school are already combined with the parent and teacher reports respectively.

#### 4.6. Calculating Effect Sizes

ESs were computed by calculating Cohen's  $d$  from the available information, which were predominantly means and standard deviations. Second, the individual ESs for each study were calculated as a pooled ES averaged across the child behavioral outcome measures (i.e., CBCL, ECBI, etc.)<sup>23</sup> and across the outcome sources (parent, teacher, and/or direct observer reports).<sup>24</sup> Third, the individual study-based ES was computed using the treated and control group sample sizes for which data was not missing for the relevant child behavioral measures.<sup>25</sup>

#### 4.7. Adjusting and Weighting Effect Sizes

While Cohen's  $d$  is the most common summary effect size statistic, others have cautioned against relying solely on a pooled ES without taking into account the sample size differences across studies (Hedges & Olkin, 1985). Therefore, as per Hedges and Olkin's recommendations (i.e., the unbiased ES), the individual ESs were adjusted according to their samples size to correct for bias. Table 4.4 displays the results of the individual unbiased ESs generated for each study included in the meta-analysis along with their corresponding confidence interval based on their unbiased ESs. In addition, a Forest plot of the distribution of the unbiased ESs sorted by magnitude is shown in Figure

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<sup>23</sup> Since the majority of the early family/parent training interventions included in this meta-analysis are intended to reduce a host of child behavior problems including internalizing and externalizing behavior problems (see Webster-Stratton et al., 2004), we used the aggregate/total CBCL scores when provided or averaged the CBCL scores across the subscales before calculating the ES. Similarly, since the studies that used the ECBI commonly report the scores from the Problem and Intensity Scale, we computed an ES for each score and then pooled/averaged these two ES together in order to generate the overall ES for this particular measure.

<sup>24</sup> It is important to note here that this more conservative way to estimate ESs takes into account the possible divergence in reporting practices, although these sources tend to be correlated. Therefore, when a child behavioral outcome measure *or* source indicated that the treated group performed worse than the control group compared with another outcome measure *or* source that evidenced a positive effect for the treated group, these effects were pooled together to generate the overall ES.

<sup>25</sup> In cases where the treated and control group sample sizes varied across sources (i.e., mother, father, etc.) and/or across measures (i.e., CBCL, ECBI, etc.), the sample sizes of the treated and control groups were averaged across the outcome sources and/or measures before estimating the ES.

1. As can be seen, the ESs varied across studies ranging from a low  $-0.97^{26}$  to a high of 2.19. This indicates that the effect of early family/parent training ranged from having a large negative effect (i.e., the control group means on the child behavioral outcomes were lower than the treated group means) to a having a substantial positive effect (i.e., the treatment group means were lower than the control group means).

Hedges and Olkin (1985) also suggest using the inverse variance weight to weight each individual ES by the sample size of the treated and control groups to give more weight to the ESs generated from larger samples. For instance, an ES of 0.50 produced from comparing 10 treated and 10 control subjects is not given as much weight as an ES of 0.50 generated from the results of 100 treated and 100 control subjects. Thus, after applying the inverse variance weight to the individual ESs, the mean ES from a random effects model using Lipsey and Wilson's SPSS macros produced a mean ES of 0.35 with a confidence interval of 0.26 – 0.44 ( $z= 7.55; p<.001$ ), corresponding to 50% recidivism in the control group compared with 33% recidivism in the experimental group (see Farrington and Loeber, 1989).<sup>27</sup>

#### **4.8. Homogeneity Tests and Moderator Analyses**

We mentioned previously that it was our general assumption that the individual ESs were not likely to be homogeneous or consistent with an assumption that the ESs come from the same population. Therefore, we estimated the  $Q$  statistic in order to examine if the homogeneity assumption was in fact violated (i.e., the ESs are

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<sup>26</sup> The one study with the worst effect size ( $-0.97$ ) was Helfenbaum and Ortiz (2007), but it is worth noting that this effect was only based on the father reports because there was not enough information provided on how many mothers participated in providing data for the child outcome measures.

<sup>27</sup> In order to determine if any outliers were having a substantial impact on the mean ES, we removed the 3 outliers that had individual ESs greater than two standard deviations from the mean ES and re-estimated the mean ES with the remaining 52 studies. The mean ES after removing the outliers was reduced to 0.32 (ci= 0.24 - 0.40); therefore, we opted to retain the outliers since they did not appear to have a large effect on the mean ES.

heterogeneous). The  $Q$  statistic is distributed as a chi-square with  $k-1$  degrees of freedom where  $k$  is the number of effect sizes (Hedges & Olkin, 1985). The  $Q$  statistic generated from these data was 149.29 with 54 degrees of freedom (i.e., 55 studies - 1), which was in fact statistically significant indicating that our initial assumption was confirmed and the ESs were heterogeneous. Therefore, it was necessary to further examine other relevant variables that may explain some of the heterogeneity of the ESs.

Some of the variables that were explored in this stage of the analysis were publication year, country of publication, program type, small versus large samples, and publication bias. All of the analyses presented here were estimated using Lipsey and Wilson's SPSS macros for the analog to the ANOVA and weighted least squares regression (with random effects).

The oldest study included in this meta-analysis was Cullen (1976) and the most recent study was Hiscock et al. (2008). The correlation between the year of publication and the ES (calculated by taking the square root of R-squared) was marginally statistically significant ( $r = -.22; p = .06$ ), and the direction of the correlation was negative indicating that older studies tended to have larger ESs. Overall sample size was also significantly negatively correlated with ES ( $r = -.39, p < .001$ ), with smaller studies reporting greater ESs.

The results of the analog to the ANOVA estimated for the following moderator variables are presented in Table 4.5. As discussed earlier, the early family/parent training intervention in the majority of the studies in this meta-analysis were based in the United States ( $n=38$ ) and the other countries that provided relevant studies included Australia ( $n=7$ ), the United Kingdom ( $n=5$ ), Canada ( $n=2$ ), the Netherlands ( $n=1$ ), New Zealand

( $n=1$ ), and China ( $n=1$ ). Given the small number of studies in the countries other than the United States the remaining countries were combined to create the “Non US-based” category prior to examining the results. The mean ESs were substantively and significantly different when comparing US-based studies with those studies not conducted in the US ( $Q_{\text{between}}= 5.38$ ;  $df= 1$ ;  $p= .02$ ;  $\tau^2= 0.05$ ,  $se= 0.02$ ). More specifically, the weighted ES for US-based studies was 0.42 (20% reduction in recidivism) compared with a 0.20 weighted ES (9% reduction in recidivism) for Non US-based studies.

Eight of the studies were considered home visitation studies where the intervention children received home visits typically by doctors, nurses, or paraprofessionals relatively early on in life (i.e., pre-birth and/or during infancy). Comparatively, the bulk of the studies were broadly classified as parent training programs ( $n=47$ ) that involved some type of parent training and were typically provided in either individual or group settings. The analog to the ANOVA results failed to indicate that the ESs for home visitation programs in comparison with parent training programs were significantly different from one another ( $Q_{\text{between}}= 0.19$ ;  $df= 1$ ;  $p= .663$ ;  $\tau^2= 0.06$ ,  $se= 0.02$ ).

Keeping in mind that some of the studies employed multiple data sources for the outcome measures (i.e., parent, teacher, and direct observer) and others only focused on one data source for reporting, it was still important to examine the possible differences in the mean ES across the three main types of outcome sources. It appears that the effect of early family/parent training was largest when based on parent reports (weighted ES= 0.34; 16% reduction in recidivism), which is not surprising given the closeness of the



intervention with the reporting source (i.e., providing parent training/home visits to the parents and then asking the parents to report on their child's behaviors). The next largest weighted ES was based on direct observer reports (weighted ES= 0.28; 13% reduction in recidivism) followed by teacher reports (weighted ES= 0.24; 11% reduction in recidivism). These ESs were not found to be statistically different from one another ( $Q_{\text{between}}= 1.55$ ;  $df= 1$ ;  $p= .461$ ;  $\tau^2= 0.06$ ,  $se= 0.02$ ), which further supports the rationale for pooling the ESs across the outcome sources.

The last two variables that were explored as moderators were comparing small samples ( $n<100$ ) with large samples ( $n>100$ ) and comparing published with unpublished studies. The weighted ESs appeared to differ substantially when based on small samples (weighted ES= 0.47; 23% reduction in recidivism) instead of having used samples with more than 100 children (weighted ES= 0.21; 10% reduction in recidivism). Thus, it was not surprising that the analog to the ANOVA results demonstrated a significant difference in these ESs ( $Q_{\text{between}}= 9.81$ ;  $df= 1$ ;  $p= .002$ ;  $\tau^2= 0.04$ ,  $se= 0.02$ ).

Lastly, while disagreement exists as to whether including literature such as this (e.g., unpublished studies) is necessary for meta-analytic research (see Dush et al., 1989; Eppley et al., 1989; McLeod & Weisz, 2004), we erred on the side of inclusion and attempted to locate any unpublished sources of data. We were only able to find four studies that were not published (Fanning, 2007; Kim et al., 2007; Tucker, 1996; Tulloch, 1997) and a comparison between these four studies with the other 51 studies that were based on published data failed to reveal any significant differences ( $Q_{\text{between}}= 0.01$ ;  $df= 1$ ;  $p= .934$ ;  $\tau^2= 0.04$ ,  $se= 0.01$ ) between the weighted ES of published (0.35; 17% reduction in recidivism) and unpublished studies (0.37; 18% reduction in recidivism).

One final weighted least squares regression model (with random effects) was estimated using maximum likelihood ( $\tau^2 = 0.04$ ,  $se = 0.01$ ) in order to determine the significant predictors of the variation in the ESs across the studies (see Table 4.6) using Lipsey and Wilson's SPSS macros. The results of the regression model further confirmed the findings detected at the bivariate level. The only statistically significant moderator of ES was whether or not the study was based on a small sample ( $n < 100$ ), controlling for the study having been conducted in the US, year of publication, published data, and being a parent training program. In addition, studies that were conducted in the US (yes/no) approached statistical significance as a predictor of ES ( $p = 0.14$ ).<sup>28</sup>

#### **4.9. Supplemental Publication Bias Analysis**

Although the results from the analog to the ANOVA analysis described earlier failed to detect any significant differences with regard to the ES for published versus unpublished studies, it was still important for us to further investigate the possibility of publication bias. Furthermore, additional publication bias analyses were also warranted considering that we found a significant negative correlation between sample size and ES (as discussed previously), which is often an indicator of publication bias.

While there are a number of ways to explore publication bias both visually and/or through the use of various test statistics, we opted to further explore the presence of publication bias in these data through the use of a funnel plot and estimating the relevant test statistics, i.e., Kendall's test and Egger's test (see Borenstein, 2005). The result of the funnel plot estimated with the user-written 'metafunnel' macro in Stata 10.0 (see

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<sup>28</sup> Separate weighted least squares regression models (with random effects) were also estimated for the small sample studies and the large sample studies. These findings failed to reveal any more substantive information than what was already demonstrated in the full sample model (i.e., the marginal significance of being a US-based study). Thus, we did not include these additional models in the text.

Sterne & Harbord, 2004) is graphically displayed below in Figure 2. As can be seen in the figure (where the larger studies are plotted at the top and the smaller studies are plotted at the bottom), the smaller studies tended to cluster toward the right, suggesting the possibility of publication bias. In addition, Kendall's test yielded a corrected  $z$ -value of 3.49 ( $p < .001$ ) and Egger's test produced coefficient of 1.84 with a standard error of 0.35,  $t = 5.20$ ,  $p < .001$ , which also suggested the presence of publication bias.

**Table 4.4. Effect Sizes, Confidence Intervals, and Significance**

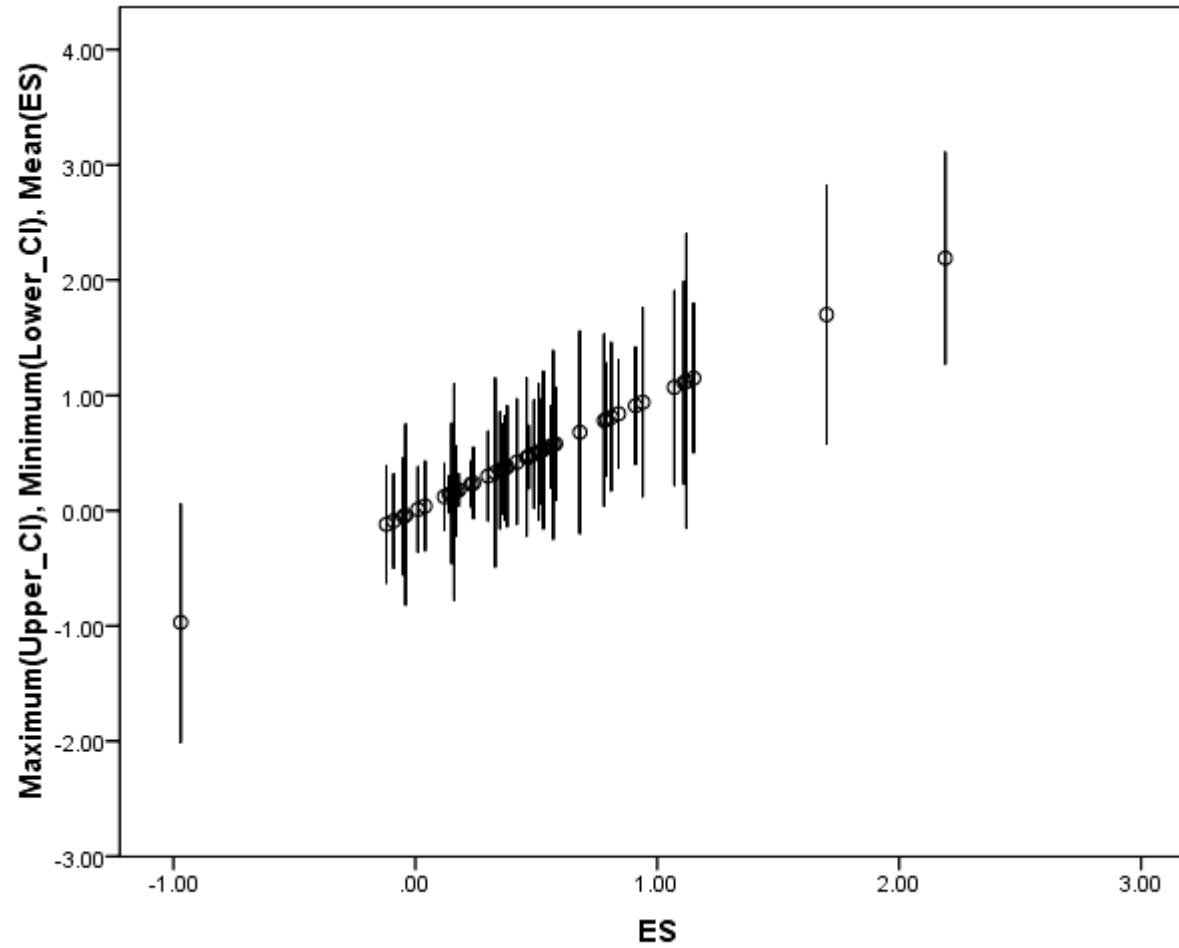
<i>Author, Publication Date</i>	<i>Effect Size (d)</i>	<i>95% CI (Lower Bound)</i>	<i>95% CI (Upper Bound)</i>	<i>Significance</i>
Abbott-Shim et al. (2003)	-0.04	-0.47	0.39	ns
Barkley et al. (2000)	0.01	-0.36	0.38	ns
Bradley et al. (2003)	0.12	-0.17	0.41	ns
Brestan et al. (1997)	1.11	0.23	1.99	s
Butz et al. (2001)	0.30	-0.09	0.69	ns
Connell et al. (1997)	2.19	1.27	3.11	s
Cullen (1976)	0.35	0.00	0.70	ns
Cunningham et al. (1995)	0.17	-0.22	0.56	ns
Edwards et al. (2007)	0.36	-0.03	0.75	ns
Eyberg et al. (1995)	1.70	0.58	2.82	s
Fanning (2007)*	0.57	-0.25	1.39	ns
Feinfield & Baker (2004)	0.51	-0.08	1.10	ns
Fergusson et al. (2005b)	0.23	0.03	0.43	s
Gardner et al. (2006)	0.35	-0.16	0.86	ns
Hamilton & MacQuiddy (1984)	1.07	0.22	1.91	s
Heinicke et al. (2001)	0.91	0.40	1.42	s
Helfenbaum & Ortiz (2007)	-0.97	-2.01	0.06	ns
Hiscock et al. (2008)	-0.05	-0.19	0.09	ns
Johnson & Breckenridge (1982)	0.56	0.20	0.91	s
Kim et al. (2007)*	-0.04	-0.82	0.75	ns
Kitzman et al. (1997)	0.14	-0.02	0.30	ns
Leung et al. (2003)	0.79	0.30	1.28	s
Markie-Dadds & Sanders (2006)	1.15	0.50	1.80	s
McCarton et al. (1997)	0.18	0.04	0.32	s
McNeil et al. (1991)	0.16	-0.78	1.10	ns
Morawska & Sanders (2006)	0.52	0.06	0.97	s
Nicholson et al. (1998)	0.81	0.17	1.46	s
Nicholson et al. (2002)	0.94	0.12	1.76	s
Olds, Robinson, Pettitt et al. (2004)	0.04	-0.12	0.20	ns
Patterson et al. (2002)	0.04	-0.35	0.43	ns
Reid et al. (2007)	0.24	-0.07	0.55	ns
Sandy & Boardman (2000)	0.84	0.52	1.15	s

Sanders, Markie-Dadds et al. (2000)	0.47	0.19	0.74	s
Sanders, Montgomery et al. (2000)	0.38	-0.14	0.91	ns
Schuhmann et al. (1998)	1.11	0.39	1.84	s
Schweinhart et al. (1993)	0.38	-0.03	0.79	ns
Scott et al. (2001)	0.84	0.37	1.31	s
Shaw et al. (2006)	-0.09	-0.50	0.32	ns
Sonuga-Barke et al. (2001)	-0.05	-0.56	0.46	ns
Strayhorn & Weidman (1991)	0.33	0.07	0.58	s
Stone et al. (1988)	-0.12	-0.63	0.39	ns
Taylor et al. (1998)	0.15	-0.46	0.76	ns
Tucker (1996)*	0.33	-0.49	1.15	ns
Tulloch (1997)*	0.68	-0.20	1.56	ns
Van Zeijl et al. (2006)	0.12	-0.14	0.37	ns
Webster-Stratton (1982)	0.53	-0.16	1.21	ns
Webster-Stratton (1984)	0.78	0.04	1.53	s
Webster-Stratton et al. (1988)	0.58	0.09	1.07	s
Webster-Stratton (1990b)	0.46	-0.22	1.15	ns
Webster-Stratton (1992)	0.37	-0.08	0.82	ns
Webster-Stratton & Hammond (1997)	0.42	-0.12	0.97	ns
Webster-Stratton (1998)	-0.05	-0.27	0.17	ns
Webster-Stratton et al. (2001)	0.04	-0.21	0.29	ns
Webster-Stratton et al. (2004)	0.49	0.02	0.96	s
Zangwill (1983)	1.12	-0.15	2.40	ns
<b>Total Weighted ES</b>	<b>0.35</b>	<b>0.26</b>	<b>0.44</b>	<b>21/55<sup>a</sup></b>

<sup>a</sup> Proportion of significant ESs

\*unpublished data

**Figure 1. Forest Plot of the Distribution of Unbiased Effect Sizes Sorted by Magnitude (N=55 studies).**



**Table 4.5. Weighted Effect Sizes, Confidence Intervals, z-tests and Q statistics of Moderators (with Random Effects)**

<i>Variables</i>	<b>N</b>	<b>Weighted ES</b>	<b>Lower 95% CI</b>	<b>Upper 95% CI</b>	<b>z-test</b>	<b>Q-statistic</b>
Country of Publication*						
US-based	38	.42	.31	.53	7.54***	47.19
Non US-based	17	.20	.05	.35	2.56*	19.05
Publication Bias						
Published	51	.35	.26	.44	7.28***	66.55*
Not Published	4	.37	-.11	.85	1.50	1.27
Type of Program						
Parent Training	47	.36	.26	.46	7.08***	55.60
Home Visits	8	.30	.04	.56	2.25*	11.73
Small vs. Large Samples***						
N<100	37	.47	.35	.59	7.80***	55.62*
N>100	18	.21	.09	.32	3.51***	13.69
Outcome Source						
Parent Reports	52	.34	.26	.43	7.87***	75.65*
Teacher Reports	14	.24	.08	.40	2.92*	8.46
Direct Observer Reports	16	.28	.12	.44	3.52**	12.52
<b>Total</b>	<b>55</b>	<b>.35</b>	<b>.26</b>	<b>.44</b>	<b>7.55***</b>	<b>149.29***</b>

\*p<.05 \*\*p<.01 \*\*\*p<.001

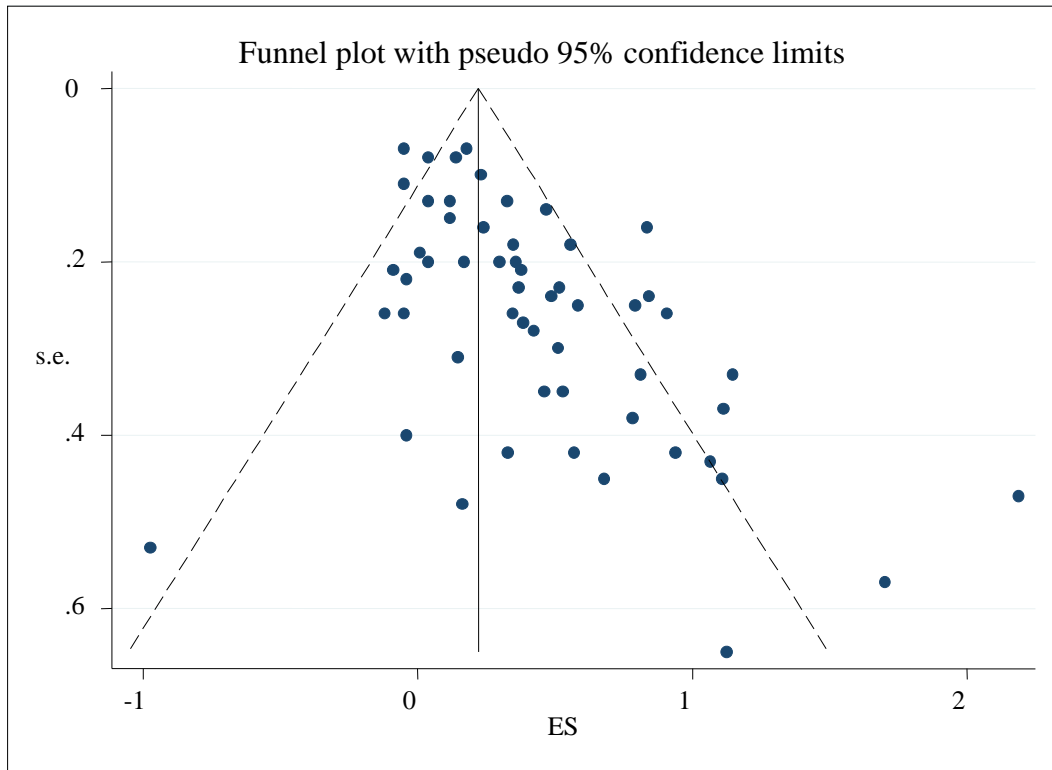
**Table 4.6. Meta-Analysis Weighted Least Squares Regression (with Random Effects)**

<i>Variables</i>	<i>b</i>	<i>SE</i>	<i>z-test</i>	<i>p-value</i>	<i>Beta</i>
Published	.074	.241	.305	.760	.034
Parent Training	.067	.122	.549	.582	.060
Publication Year	-.006	.006	-.937	.349	-.113
Small Sample	.237	.083	2.844	.005**	.322
US-based	.137	.093	1.466	.143 <sup>+</sup>	.177

<sup>+</sup>p<.20 \*p<.05 \*\*p<.01 \*\*\*p<.001



**Figure 2. Funnel Plot.**



#### **4.10. Additional Delinquency/Crime Outcomes**

As mentioned previously there were 27 studies that were not specifically included in this meta-analysis in order to ensure the independence of the samples or only provided information on adolescent/adult outcomes. However, it is important that we still highlight the important findings gleaned from these studies at least in narrative form. More specifically, based on the descriptive results presented in Table 4.7 it appears that early family/parent training has an effect on delinquency in adolescence and crime in adulthood. More specifically, involvement in early family/parent training has been shown to result in fewer teacher rated behavior problems at ages 8-11 (Johnson & Walker, 1987), fewer instances of running away, fewer arrests, convictions, and probation violations, fewer smoked cigarettes per day, fewer days having consumed alcohol, and fewer behavioral problems related to use of alcohol and other drugs at age 15 (Olds et al., 1998), lower rates of juvenile and violent arrests at age 18 (Reynolds et al., 2001), lower prevalence of arrests for violent, property, drug, and other crimes up to age 27 and also up to age 40 (Schweinhart & Xiang, 2003; Schweinhart, 2007). However, one study failed to find a significant difference for having been in trouble with the law (Johnson, 2006) when comparing those who participated in an early family/parent training intervention compared with the control group (ages ranged from 9-16 years old).

**Table 4.7. Additional Delinquency/Crime Outcomes of Studies Not Included in Meta-Analysis**

<i>Author, Publication Date</i>	<i>Additional Results and/or Adolescent/Adult Outcomes</i>
I--Cullen (1976) NI--Cullen & Cullen (1996)	Intervention children that received home visitation were less likely to be smokers at age 25-27.
I--Edwards et al. (2007) NI--Hutchings et al. (2007b) NI--Jones et al. (2007)	Mothers and direct observers of intervention children who received parent training reported fewer behavior problems. Mothers of intervention children also reported lower levels of inattention and hyperactive/impulsive difficulties in their children at follow-up.
I--Fergusson (2005b) NI--Fergusson (2005a)	The mothers of intervention children that received home visitation reported that their children had fewer behavior problems at age 3.
I--Johnson and Breckenridge (1982) NI--Johnson and Walker (1987) NI--Johnson (2006)	Teacher reports at ages 8-11 years old showed reduction in behavior problems. A long-term follow-up of children who participated in parent training programs in Alabama, Louisiana, and Texas (United States) showed few significant differences in their behavior problems and trouble with the law in late childhood/early adolescence according to both parent and teacher reports (with the exception of the early Texas cohorts).
I--Kitzman et al. (1997) NI--Olds, Kitman, et al. (2004) NI--Olds, Kitman, et al. (2007)	Fewer mothers of intervention children that received home visitation reported that their children had behavioral problems in the borderline/clinical range at age 6. Parents and teachers of intervention children who received home visitation reported a lower incidence of conduct problems in grades 1-3 and less antisocial behavior at age 9.
I--McCarton et al. (1997) NI--Brooks-Gunn et al. (1994) NI--McCormick et al. (2006)	Mothers of intervention children that received home visitation reported fewer behavioral problems for their children at age 3. Intervention children (birth weight >2000 g) that received home visits showed lower self-reported scores on general and risky behavior problem measures at age 18.
I--Olds, Robinson, Pettitt et al. (2004) NI--Olds, Robinson, O'Brien et al. (2002)	Intervention children that received home visits had lower behavior problem scores at age 2 according to parent reports.
I--Schweinhart et al. (1993) NI--Schweinhart et al. (2007) NI--Schweinhart & Xiang (2003) NI--Schweinhart et al. (1985) NI--Farnworth et al. (1985)	Intervention children that participated in the Perry Preschool Program showed less involvement in dishonest activities and illegal escape behaviors at age 15. Intervention children were less likely to have been detained or arrested by age 19. Intervention children were less likely to have been arrested for violent, property, drug, and other crimes up to age 27 and these same findings were found when the intervention children were followed up through age 40.

<p>I--Sanders et al. (2000a)  NI--Bor et al. (2002)</p>	<p>Intervention children who received parent training showed significant reductions in their disruptive behavior problems according to parent reports. In addition, direct observers also noted the intervention children's improvement in their negative behavior problems.</p>
<p>I--Tucker (1996)  NI--Gross et al. (1995)  NI--Tucker et al. (1998)</p>	<p>Fathers and direct observers of intervention children that received parent training reported less behavior problems at ages 3 and 4. Mothers of the intervention children reported more behavior problems relative to the control children.</p>
<p>I--Webster-Stratton (1998)  NI--Baydar et al. (2003)  NI--Reid et al. (2001)  NI--Reid et al. (2004)  NI--Foster et al. (2007)</p>	<p>Children with high baseline levels of conduct problems benefitted the most from the parent training program based on results from structural equation modeling (SEM). According to direct observer ratings, the behavior of intervention children improved over time for all groups that received parent training. Teacher reports also indicated that all intervention children that received parent training showed reductions in their total problem behaviors over time with the exception of intervention children who received child training, parent training, and teacher training.</p>
<p>NI--Olds et al. (1998)</p>	<p>Intervention children in Elmira, New York (USA) who received home visitation reported significantly fewer instances of running away, fewer arrests, fewer convictions, fewer probation violations, fewer smoked cigarettes per day, fewer days having consumed alcohol at age 15. Mothers of intervention children who received home visits reported that their children had fewer behavioral problems related to use of alcohol and other drugs at age 15.</p>
<p>NI--Reynolds et al. (2001)</p>	<p>Intervention children in Chicago, Illinois (USA) who completed participation in the Child-Parent Center Preschool Program had lower rates of juvenile arrests and violent arrests at age 18.</p>

<sup>a</sup> I=Included; NI=Not Included

\*unpublished data

## **5. DISCUSSION & CONCLUSIONS**

There has been some debate about the effectiveness of early family/parent training programs to prevent crime and hence, on the wisdom of spending large sums of money on this effort. A key issue is how far funding for these programs has been based on high quality scientific evidence demonstrating its efficacy in preventing child behavior problems including antisocial behavior and delinquency. In general, while there have been few rigorous evaluations, far-fewer randomized experimental designs with which to conduct such evaluations, and mixed evidence with respect to the effectiveness of early family/parent training programs across the studies, there is a trend suggesting that the programs do offer some delinquency reduction. However, the evidence also indicates that there is variation within family-based prevention programs such as the lack of separating the results across the specific intervention types. Nevertheless, recent reviews of these efforts have noted the need for more and higher quality, independent evaluation studies.

The objective of this current systematic review was to synthesize the extant empirical evidence (published and unpublished) on the effects of early family/parent training programs implemented in early childhood in preventing child behavior problems including antisocial behavior and delinquency. The report conformed to the systematic review methodology and incorporated meta-analytic techniques to assess results. The point of departure for the current study begins with the Farrington and Welsh and Bernazzani and Tremblay reviews. Our review advanced these efforts in several important ways including: (1) allowing for interventions through age 5, (2) separating the

various types of interventions (parent training versus home visitation), and (3) updating the database regarding parenting prevention programs through 2008.

### **5.1. Summary of Main Findings**

Our search identified 55 studies, most in the United States, relying on published data, included randomized controlled trials, and typically followed parent training protocols. All of the studies included in this meta-analysis relied on self-report data for their measured child behavioral outcomes and the majority of the studies used parent reports.

Findings indicated that the weighted mean ES was 0.35, which was in the range of early family/parent training having a small to moderate effect on reducing child behavior problems. We also discovered that there was significant heterogeneity among the ESs; thus, we examined other relevant variables that could explain some of this heterogeneity. This analysis revealed a marginally statistically significant correlation between the year of publication and the ES, indicating that older studies tended to have larger ESs. Sample size was also significantly negatively correlated with ES, with smaller studies generating larger ESs. The results from subsequent analog to the ANOVA and weighted least squares regression analysis (with random effects) indicated that studies that were based on small samples ( $n < 100$ ) and studies that were conducted in the US demonstrated significantly larger ESs when compared to those studies based on large samples ( $n > 100$ ) and Non US-based studies. Statistically significant differences were not detected across program type (parent training versus home visits), published versus unpublished data, or outcome source (parent, teacher, direct observer reports). In addition, the results of a funnel plot indicated that publication bias was present in the analysis.

## **5.2. Priorities for Research**

To the best of our knowledge, our review provides the most exhaustive and authoritative assessment on the evaluation of early family/parent training programs. At the same time, we recognize that our work is certainly not the final word on this issue. As is the case with any meta-analysis/review of any topic in criminology/criminal justice, there will always be specific coding decisions that all interested parties will not agree with or that some coding decisions will not be in full agreement. Nevertheless, our effort represents the largest database from which to go forward, continue, expand and modify with respect to early family/parent training programs. Given the importance of such prevention efforts and the resources afforded to them, it is imperative that continued evaluation of outcomes be carried out going forward. Along these lines, Sherman (2003) suggests that databases such as those being developed by the Campbell Collaboration must be living works that evolve over time. We hope that such a suggestion is embraced fully by researchers and policy-makers alike, especially with respect to the one we have created for this review.

Toward this end, we envision a number of priorities for future research in this area. First, more generally, further demonstration (randomized) trials that test the effects of early family/parent training during early childhood on disruptive behavior and delinquency should help to build a more extensive knowledge base for this type of intervention (Farrington & Welsh, 2006:234). Second, there is a need to follow the early intervention cohorts/samples further into adolescence to assess effects on delinquency and then into adulthood for effects on crime and disorder in other life domains (which we suspect that early family/parent training will have indirect effects on). This will take

some time, but periodic updates of the review should produce more information on delinquency in the short term. Third, it would also be of import that future studies parcel out and specifically focus on the effect of early family/parent training on specific child behavior problems including antisocial and delinquent behaviors. It may be that early family/parent training programs have better effects on particular types of behaviors than others. Fourth, there is a need to identify the particular ingredients that make the specific early family/parent training programs successful at inhibiting antisocial and delinquent behaviors. This is important because, at times, it is difficult to identify what features of an early family/parent training program are responsible for the observed effects when there are multiple interventions operating at the same time. Fifth, although we did not do so, it would be interesting to include information on who delivered the specific early family/parent training intervention (i.e., the professional vs. paraprofessional issue has been prominent in debates about home visiting, generally). Sixth, with respect to the type of outcome, we recognized earlier that the theoretical and operational definition of aggression, antisocial behavior, and delinquency varies across studies and over time. Careful and consistent definitions of aggression and antisocial behavior do not exist in the more general delinquency/criminal career area, and in the early family/parent training area in particular. Dealing with this issue will be important going forward. Seventh, it is entirely plausible that some negative child outcomes may be related to factors beyond parental and family skills. For example, early family/parent training programs may not be able to influence aspects of a child's environment that strongly influence behavior, such as disorganized neighborhoods and access to legitimate opportunity structures. In short, the infusion of sociological understanding in addition to the standard focus on the



psychological parts of early family/parent training programs may aid in how these programs are developed, carried out, and then subsequently evaluated by taking into account these structural factors. Eighth, more effort should be made to determine links in the causal chain between family processes and offending. In other words, there is a need for more theoretical and especially empirical work that establishes the facts linking parents/families to offspring crime. Such basic research is likely to generate insight and clues into the sorts of applied programs that need to be developed. As a consequence, better designed programs that are built on basic research may be more apt to demonstrate effects, and more long-term follow-ups should be carried out to establish the persistence of the early effects. Ninth, although the focus of the present review was on effectiveness of early family/parent training in preventing children's antisocial behavior and delinquency, it is also the case that future studies should measure costs (which are typically born early) and benefits (which are typically observed later) across a variety of domains). This, of course, should be followed with repeated calls that policy-makers need to have patience when waiting for early family/parent training programs to show their promise (Dickens & Baschnagel, 2008). Lastly, searches and inclusion of early family/parent training programs carried out and documented in non-English languages should be integrated, as warranted, into the larger database to determine the international generalizability of early family/parent training's effectiveness.

### **5.3. Policy Implications**

The policy implications of research on early family/parent training have been well articulated by several researchers. In general, they suggest that early family/parent training can assist parents and families in preventing antisocial and delinquent behavior

by providing them with the tools necessary to engage in effective child-rearing. The studies included in this review show that childhood behavior problems including antisocial behavior and crime can be prevented, to some degree, with well-conceived and well-implemented early family/parent training programs. It is also important to note here that parenting programs have also been shown to have other non-crime/behavior benefits as well such as increasing educational attainment, reducing teenage pregnancy, improving economic well-being, and promoting health to name a few (see Farrington & Welsh, 2007; Reynolds et al., 2007). Although the exact, optimal circumstances that produce these outcomes among the wide range of early family/parent training programs is not very clear or well understood at the present time and needs to be established in future research, early family/parent training should be considered as a potential strategy in any early-life antisocial behavior prevention program—likely in coordination with other intervention strategies.

Our findings offer further support for a number of large-scale programs that have been implemented in Western nations to improve parenting skills of new mothers and to help prevent their children from embarking on a life of crime. As noted earlier, the provincial government of Quebec is investing \$70 million each year to support disadvantaged mothers in improving their parenting skills and increasing their access to and use of prenatal services (with similar demonstration efforts ongoing in Dublin and Paris). In Colorado, the state government is spending tens of millions of dollars (\$5.6 million in the first year) on a home visiting services program designed to prevent child maltreatment by targeting poor, first-time mothers. This initiative, known as the Nurse Home Visitor Program (NHVP), was created by state law in 2000 and is founded on the

evidence-based home visiting program developed by David Olds (see Olds et al., 1998). Importantly, NHVP is not funded as a one-off program or designed to be limited to the most at-risk families: “The intention of the legislation is that the program be expanded annually so that the services will be available for all eligible mothers who choose to participate in all parts of the state” (Calonge, 2005: 5). Similar nurse family partnership programs are also currently being implemented and evaluated in the United Kingdom as well.

In sum, our analysis clearly shows that early family/parent training can be implemented as an effective method for reducing childhood behavior problems including antisocial and delinquent behavior early on in the child’s life. Additionally, it is also likely the case that benefits of early family/parent training will permeate into other domains of the life course, although this remains not well-documented. Still, to the extent that this is the case, the long-term impact of early family/parent training programs may likely provide benefits to a range of individuals and situations independent of the family and child. Early family/parent training appears to have few negative effects and clear benefits for parents and children alike.

## **Timeframe**

The review process adhered to the following schedule:

Search for published and unpublished studies	December 2007-February 2008
Relevance assessments	December 2007-February 2008
Coding of eligible studies	January-March 2008
Statistical analysis	March 2008
Preparation of report	March-April 2008
Draft of report	April 2008
Submission of completed report	June 2008

## **Plans for Updating the Review**

The authors expect to update the review every five years.

## **Statement Concerning Conflicts of Interest**

Drs. Piquero, Farrington, Welsh, Tremblay, and Jennings have no financial interest in any existing or planned family/parent program. Dr. Tremblay has been involved in several intervention and prevention programs in Canada; thus, the only potential conflict of interest is consistent with prior scholarly publications. The research team will strive to avoid any potential conflict.

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## Appendix 1. Parent/Family Meta-Analysis Coding Sheets

### I. ELIGIBILITY CHECK SHEET

1. Document ID:
2. First author last name:
3. Study Title:
4. Journal Name, Volume and Issue:
5. Document ID:
6. Coder's Initials
7. Date eligibility determined:
8. A study must meet the following criteria in order to be eligible. Answer each question with a "yes" or a "no"
  - a. The study is an evaluation of a parent/family intervention.
  - b. The study includes a comparison group (or a pre-intervention comparison period in the case of pre-post studies) which did not receive the treatment condition. Studies may be experimental, quasi-experimental, or pre-post evaluations.
  - c. The study reports on at least one outcome (antisocial behavior, disruptive behavior, delinquency, crime).
  - d. The study is written in English.

If the study does not meet the criteria above, answer the following question:

- a. The study is a review article that is relevant to this project (e.g., may have references to other studies that are useful, may have pertinent background information)

9. Eligibility status:  
 Eligible  
 Not eligible  
 Relevant review

Notes:

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## II. CODING PROTOCOL

### Reference Information

1. Document ID: \_ \_ \_ \_
2. Study author(s): \_\_\_\_\_
3. Study title: \_\_\_\_\_
- 4a. Publication type: \_\_\_\_\_
  1. Book
  2. Book chapter
  3. Journal article (peer reviewed)
  4. Thesis or doctoral dissertation
  5. Government report (state/local)
  6. Government report (federal)
  7. Police department report
  8. Technical report
  9. Conference paper
  10. Other (specify)
- 4b. Specify (Other) \_\_\_\_\_
5. Publication date (year): \_\_\_\_\_
- 6a. Journal Name: \_\_\_\_\_
- 6b. Journal Volume: \_\_\_\_\_
- 6c. Journal Issue: \_\_\_\_\_
7. Date range of research (when research was conducted):  
Start: \_\_\_\_\_  
Finish: \_\_\_\_\_
8. Source of funding for study: \_\_\_\_\_
9. Country of publication: \_\_\_\_\_
10. Date coded: \_\_\_\_\_
11. Coder's Initials: \_ \_ \_

### **Sample Characteristics**

*The following questions are about the target population of the intervention (if the intervention is not targeting groups of problem people skip to question 38):*

12a. What is the target population of the treatment? \_\_\_\_\_

1. Universal
2. Low-income
3. Selective infants (low-birth weight, etc.)
4. Entire population (no specific groups targeted)
5. Pregnant women
6. Selective women (based on age)
7. Other (specify)

12b. Specify (other) \_\_\_\_\_

13. What is the exact target population? \_\_\_\_\_

14. Total population of target population (if known): \_\_\_\_\_

15. Gender composition of target population:

1. Mostly male
2. Mostly female
3. Unknown/not mentioned

16. Age composition of target population

1. Mostly children
2. Mostly adolescents
3. Unknown/not mentioned

17. Socio-economic status of target population:

1. Mostly below poverty line
2. Mostly above poverty line
3. Unknown/not mentioned

18. Race/ethnicity of the sample

1. percentage white
2. percentage African-american
3. percentage Asian
4. percentage native American
5. percentage white/Caucasian

19. What country did the intervention take place in: \_\_\_\_\_

20. What was the initial sample size recruited into the study and what was the final N (sample number related to outcomes examined in the review)? \_\_\_\_\_ (initial) / \_\_\_\_\_ (final)

**Intervention Characteristics**

21. What was the average age at the Start of the Intervention? \_\_\_\_\_ months

22. How long was the intervention period (child's age)? \_\_\_\_\_ years

- 23a. What was the type of intervention?
- a. clinic-based interview with practitioner
  - b. family workshops
  - c. home visits only
  - d. parent groups
  - e. child development center
  - f. other (specify)

23b. Specify (Other)\_\_\_\_\_

**Methodology/Research design:**

- 24a. Type of study: \_\_\_\_\_
- 1. Randomized experiment
  - 2. Nonequivalent control group (quasi-experimental)
  - 3. Multiple time series (quasi-experimental)
  - 4. Pre-post test (no control group)
  - 5. Other (specify)

24b. Specify (Other)\_\_\_\_\_

25. Was the program highly structured, that is, followed a set protocol?
- a. yes
  - b. no
  - c. cannot tell

- 26a. Did the program remain consistent over time?
- a. yes
  - b. no
  - c. cannot tell

- 26b. Were there adjustments for baseline differences?
- a. yes
  - b. no
  - c. cannot tell

26c. Were there adjustments for attrition?

- a. yes
- b. no
- c. cannot tell

26d. Were there adjustments for differential attrition?

- a. yes
- b. no
- c. cannot tell

***Outcomes reported*** (Note that for each outcome, a separate coding sheet is required)

27. How many outcomes are reported in the study? \_\_\_\_\_

28. What is the specific outcome recorded on this coding sheet?

\_\_\_\_\_

29. Was it the primary outcome of the study? \_\_\_\_\_

- 1. Yes
- 2. No
- 3. Can't tell/researcher did not prioritize outcomes

30a. Was this initially intended as an outcome of the study? \_\_\_\_\_

- 1. Yes
- 2. No (explain)
- 3. Can't tell

30b. If no, explain why:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

***Dependent Variable***

31a. What type of data was used to measure the outcome covered on this coding sheet?

- 1. Official data (from the police, court, etc.)
- 2. Mother's report
- 3. Teacher's report
- 4. Self-report surveys
- 5. Other (specify) (professional observation, assessment, or diagnosis)

31b. Specify (Other)\_\_\_\_\_

32a. If official data was used, what specific type(s) of data were used? (Select all that apply)

1. Police contacts
2. Arrests
3. Court records
4. Convictions
5. Other (specify)
6. N/A (official data not used)

32b. Specify (Other) \_\_\_\_\_

33a. Did the researcher assess the quality of the data collected?

1. Yes
2. No

33b. Did the researcher(s) express any concerns over the quality of the data?

1. Yes
2. No

33c. If yes, explain

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34a. Does the evaluation data correspond to the initially stated problem? (i.e., if the problem is delinquency, does the evaluation data look at whether delinquency decreased)

1. Yes
2. No

34b. If no, explain the discrepancy:

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35a. If self-reports are used, were outcome data:

1. dichotomous
2. continuous
3. ordinal
4. combination
5. Other (specify)

35b. Other (specify): \_\_\_\_\_



## **Effect Size/Reports of statistical significance**

### *Dependent Measure Descriptors*

#### ***Sample size***

36. Based on the unit of analysis for this outcome, what is the total sample size in the analysis? \_\_\_\_\_

37. What is the total sample size of the treatment group (group that receives the response)? \_\_\_\_\_

38. What is the total sample size of the control group (if applicable)? \_\_\_\_\_

38a. Was attrition a problem in the analysis for this outcome?

1. Yes
2. No

38b. If attrition was a problem, provide details (e.g., how many cases lost and why they were lost).

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#### ***Effect Size Data***

39. Raw difference favors (i.e., shows more success for):

1. Treatment group (or post period)
2. Control group (or pre period)
3. Neither (exactly equal)
9. Cannot tell (or statistically insignificant report only)/ Not Applicable (Pre-Post study)

40. Did a test of statistical significance indicate statistically significant differences between either the control and treatment groups or the pre and post tested treatment group? \_\_\_\_\_

1. Yes
2. No
3. Can't tell
4. N/A (no testing completed)

41. Was a standardized effect size reported?

1. Yes
2. No

42. If yes, what was the effect size? \_\_\_\_\_

43. If yes, page number where effect size data is found \_\_\_\_\_

44a. If no, is there data available to calculate an effect size?

1. Yes
2. No

44b. Type of data effect size can be calculated from:

1. Means and standard deviations
2. *t*-value or *F*-value
3. Chi-square ( $df=1$ )
4. Frequencies or proportions (dichotomous)
5. Frequencies or proportions (polychotomous)
6. Pre and Post (and/or during counts)
7. Other (specify)

44b. Specify (other) \_\_\_\_\_

45a. Did the evaluation control for validity by using multivariate methods (i.e., regression) to assess the impact of the program on the outcome? \_\_\_\_\_

45b. If yes, did this analysis find that the intervention reduced the outcome at a statistically significant level ( $p=.05$ )? \_\_\_\_\_

#### *Means and Standard Deviations*

46a. Treatment group mean \_\_\_\_\_

46b. Control group mean \_\_\_\_\_

47a. Treatment group standard deviation \_\_\_\_\_

47b. Control group standard deviation \_\_\_\_\_

#### *Proportions or frequencies*

48a. *n* of treatment group with a successful outcome \_\_\_\_\_

48b. *n* of control group with a successful outcome \_\_\_\_\_

49a. Proportion of treatment group with a successful outcome \_\_\_\_\_

49b. Proportion of control group with a successful outcome \_\_\_\_\_

#### *Significance Tests*

50a. *t*-value \_\_\_\_\_

50b. *F*-value \_\_\_\_\_

50c. Chi-square value ( $df=1$ ) \_\_\_\_\_

*Calculated Effect Size*

51. Effect size \_\_\_\_\_

**Conclusions made by the author(s)**

*Note that the following questions refer to conclusions about the effectiveness of the intervention in regards to the current outcome/problem being addressed on this coding sheet.*

52. Conclusion about the impact of the intervention? \_\_\_\_\_

1. The authors conclude problem declined
2. The authors conclude the problem did not decline
3. Unclear/no conclusion stated by authors

53. Did the author(s) conclude that the parent/family intervention beneficial? \_\_\_\_\_

1. Yes
2. No
3. Can't tell

54. Did the author(s) conclude there a relationship between the parent/family intervention and a reduction in delinquency/crime? \_\_\_\_\_

1. Yes
2. No
3. Can't tell

55. Additional notes about conclusions:

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