

A meta-analysis of parent training: Moderators and follow-up effects

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Abstract

A meta-analysis of 63 peer-reviewed studies evaluated the ability of parent training programs to modify disruptive child behaviors and parental behavior and perceptions. This analysis extends previous work by directly comparing behavioral and nonbehavioral programs, evaluating follow-up effects, isolating dependent variables expressly targeted by parent training, and examining moderators. Effects immediately following treatment for behavioral and nonbehavioral programs were small to moderate. For nonbehavioral programs, insufficient studies precluded examining follow-up effects. For behavioral programs, follow-up effects were small in magnitude. Parent training was least effective for economically disadvantaged families; importantly, such families benefited significantly more from individually delivered parent training compared to group delivery. Including children in their own therapy, separate from parent training, did not enhance outcomes.

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Disruptive child behaviors, including aggression, oppositional behaviors, and noncompliance, are the most common problems for which parents seek professional intervention (Kazdin, Bass, Ayers, & Rodgers, 1990). Historically, mental health professionals relied on child therapy to reduce disruptive behaviors. However, since the 1960s direct intervention with parents has become a popular mode of intervention (Bourke & Nielsen, 1995; Graziano & Diament, 1992). Parent training programs, which represent one form of parental intervention, are based on the premise that parenting practices contribute to the genesis, progression, and maintenance of disruptive behaviors across childhood. Many models of child behavior problems have been developed and considerable empirical research has supported the relationship between parenting and problematic child behavior (e.g., Lytton, 1990; Patterson, Reid, & Dishion, 1992; Rutter et al., 1996). Having established a link between parenting and child behavior, parent training attempts to motivate change in parents' behavior, perceptions, communication, and understanding to effect desirable changes in child behavior.

Many studies have tested the efficacy of parent training programs. Four quantitative reviews suggest that parent training generally has a positive influence on children and parents. However, two of these reviews (Shadish et al., 1993; Weisz, Han, Granger, Weiss, & Morton, 1995) were broad based evaluations of varied interventions for children and did not directly address the effects of parent training programs on disruptive child behaviors. The other

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two quantitative reviews address the effects of parent training programs, one focusing on nonbehavioral treatments (Cedar & Levant, 1990) and the other on behavioral treatments (Serketich & Dumas, 1996).

Cedar and Levant (1990) used meta-analytic procedures to examine 26 studies involving Parent Effectiveness Training (PET) which is a nonbehavioral parent training program that attempts to alter parents' communication patterns and attitudes toward child rearing. Their findings suggest that children from the treatment groups did not benefit relative to those in the control groups (effect size [ES]=0.03) directly after treatment although a small to moderate effect was obtained for parent behavior (ES=0.37). Yet, their results demonstrated a moderate treatment effect for improved child behavior at follow-up (ES=0.53).¹

Serketich and Dumas (1996) examined outcomes of 26 behaviorally oriented parent training programs immediately after treatment. They reported large positive changes in general child outcomes (ES=0.86) based on parent, observer, and teacher reports. They reported moderate positive changes (ES=0.44) in parental behavior and adjustment.

Meta-analysis is an ideal research method for examining the relationship between features of parent training programs and outcomes because it synthesizes the results across studies while also allowing grouping of studies with similar features to compare outcomes (Cooper & Hedges, 1994; Lipsey & Wilson, 2001). However, the two meta-analytic reviews specifically examining parent training do not put to rest questions about conditions under which parent training can be expected to be most beneficial. Indeed, there are inconsistencies between the findings of these meta-analyses and expected parent training outcomes derived from theory and clinical wisdom.

Effectiveness of parent training is believed to vary based on participant characteristics and features of parent training programs. Family adversity, for example, is believed to undermine efficacy of parent training interventions by disrupting parent training processes and implementation of recommendations. Low socioeconomic status (SES), single parent status, young parent age, unstable housing, and reliance on government subsidies are associated with poorer outcome (for reviews, see Dumas & Wahler, 1983; Firestone & Witt, 1982; Forehand, Middlebrook, Rogers, & Steffe, 1983; Holden, Lavigne, & Cameron, 1990; Kazdin, Mazurick, & Bass, 1993; Kazdin & Wassell, 1999; Miller & Prinz, 1990), yet findings from Serketich and Dumas (1996) and Cedar and Levant (1990) do not reveal such effects.

Child age is also believed to influence treatment outcome. Because younger children are highly reliant on parents for fulfillment of basic needs, they are expected to be maximally responsive to child management skills taught in behavioral parent training programs (Dodge, 1993). By contrast, older children, with their more advanced reasoning abilities and lower reliance on parents, are expected to benefit more from nonbehavioral programs which focus on improving parent–child communication patterns (Cedar & Levant, 1990). Counter to these assumptions, Serketich and Dumas' meta-analysis reported a strong positive correlation ($r=0.69$) between child age and desirable outcomes, and Cedar and Levant indicated no relationship.

In addition to participant characteristics, features of parent training programs influence outcomes. Parent training is a heterogeneous mode of treatment (see Bourke & Nielsen, 1995; Kazdin, 1997), differing in theoretical orientation, amount of intervention, qualifications of the person who delivers parent training, mode of delivery (e.g., individual, group, self-directed), therapeutic components provided (e.g., stress management, marital therapy), and targeted recipients (e.g., parent only or with the child receiving therapy). Little is known about the relationship between parent training characteristics and outcomes for parents and their children, though there is currently great interest in this relationship (Holden et al., 1990; Kazdin & Wassell, 1999; Weisz & Hawley, 1998). In general, parent training outcomes are expected to be enhanced when behavioral treatments are used, when there is a focus on overcoming practical barriers (e.g., transportation), and when multisystemic treatment options are presented to families who face high levels of adversity (Miller & Prinz, 1990). Findings from Serketich and Dumas (1996) suggest behavioral parent training is a robust intervention; however, their findings cast doubt on the benefit of “enhancing” parent training by including additive components that go beyond improving parents' child management skills. Unfortunately, the narrow focus of Cedar and Levant's (1990) study precluded an examination of the effects of many treatment variables on outcomes.

¹ As a guide, effect sizes greater than 0.80 are generally considered to be large in magnitude, while those that are equal to about 0.50 are considered to be moderate. Effect sizes of about 0.20 are considered to be small in magnitude (Cohen, 1988).

The extent to which knowledge about the conditions under which parent training can help modify disruptive child behaviors has not been fully explored through meta-analytic procedures. The purpose of our meta-analysis is fourfold. First, our study provided a direct comparison of behavioral and nonbehavioral parent training programs for the treatment of disruptive behavior problems in children. Existing quantitative reviews have separately examined behavioral and nonbehavioral programs, but a direct comparison has not been conducted. Although the effect sizes from separate analyses can be compared, differences in study selection, outcome measures, and populations between meta-analyses may lead to unreliable conclusions. Moreover, the Cedar and Levant (1990) review selected only PET studies, limiting generalization to other nonbehavioral programs. Second, we provided a more precise analysis of behaviors targeted by parent training. Parent training seeks to proximally modify parents' childrearing practices and attitudes and, if successful, distally modify children's behavior. To accomplish this objective, we divided parent outcomes into parenting practices and perceptions toward parenting. For child outcomes, only indices dealing specifically with behavioral comportment within parents' supervision were included. Thus, variables assessing children's wellbeing, such as self-esteem or depression, and children's functioning outside of parental supervision were excluded. This precision in operationalizing outcomes was not present in the two previous quantitative reviews which may limit our understanding of the effect of parent training on its primary targets. Third, our analyses included both immediate post-treatment and follow-up data because understanding the durability of parent and child outcomes is critical in evaluating the overall efficacy of parent training. Fourth, our study examined variability of treatment effects to assess for significant heterogeneity and to conduct traditional moderator analyses to determine whether differences in outcomes could be explained by participant and treatment characteristics. Previous quantitative reviews of parent training have not formally assessed within-group heterogeneity, yet the standard deviations for the effect sizes reported by Serketich and Dumas (1996) and Cedar and Levant suggest considerable variability in the outcomes.

1. Method

1.1. Selection of studies

Nine criteria were used to select studies for inclusion. Studies were included if they (a) reported on parent training programs targeting disruptive child behaviors (but not criminal activity), (b) had at least one treatment and one control group which were drawn from the same population, (c) had treatment and control groups composed of at least five participants, (d) treated families in which the target children were not developmentally or cognitively delayed, (e) involved actual parent training rather than analog procedures or one-time interventions done within a laboratory setting, (f) were published in peer-reviewed sources, (g) reported pre-test and post-test means and standard deviations for both the treatment and control groups, (h) evaluated outcomes beyond satisfaction with the particular parent training program, and (i) were written in English. For studies with an ADHD component, three criteria were used to select studies for inclusion. ADHD studies were included if they included (a) a clear outcome measure or construct representing child externalizing behavior separate from symptoms of ADHD, and (b) a clear outcome measure or construct representing parent behavior separate from skills learned to manage specific ADHD symptoms, or (c) parent perceptions that focused on perceptions or knowledge other than those related to symptoms of ADHD.²

Computer searches of PsychInfo and ERIC databases were conducted for all published studies from 1974 through August of 2003. To be inclusive, we used the following broad search terms in varying combinations: parent, training, education, and skills. This strategy initially identified 2875 studies. Preliminary article selection was based on information in the abstracts. Studies were excluded if it was evident that they were not experimental in nature,

² There were 11 studies which included children who presented with disruptive behaviors *and* symptoms of Attention-Deficit/Hyperactivity (ADHD). We performed initial moderator analyses with these studies and found that immediately following treatment, there were no significant differences in how children or parents responded to parent training. However, two significant effects emerged during follow up periods for studies that employed a control group. Children identified as having high levels of ADHD symptomatology improved more ($k=4$, $d=0.65$) than children not identified as having ADHD ($k=17$, $d=0.13$), $Q_b=8.20$, $p<0.01$. Similarly, parents of children diagnosed with ADHD ($k=2$, $d=0.86$) changed their behaviors more than their counterparts ($k=12$, $d=0.18$), $Q_b=8.53$, $p<0.01$. The small number of studies included in these analyses cautions against making confident inferences about trends or the role ADHD plays in outcomes, and how such outcomes are measured, for children and parents.

examined a question other than the efficacy of parent training in managing disruptive child behaviors, or were not published in peer-reviewed journals. The preliminary screening resulted in 430 articles which were reviewed more closely and included if they met the inclusionary criteria. To ensure that prominent scholars in the parent training literature were not missed, a separate search was included for the following authors within the time frame mentioned above: Jean Dumas, Sheila Eyberg, Rex Forehand, Gerald Patterson, and Ronald Prinz. The same inclusion criteria applied to work from these authors.

Sixty-three studies were eventually included in the meta-analysis. Of these, 16 studies included two treatment groups and a control group and two studies included three treatment groups in addition to a control group. Thus, 83 treatment groups were compared to 44 control groups. See [Table 1](#) for a list of included studies and associated study details.

1.2. Dependent measures

Parent training programs aimed at reducing undesirable child behaviors and increasing desirable child behaviors typically operate on the premise that changes in parental functioning will result in improved child functioning. Therefore, dependent measures most often include some combination of child and parent outcomes. We examined one child domain and two parent-related outcomes. For children, we were interested in changes related to increased compliance and decreased disruptive behaviors. For parents, we were primarily interested in modifications in child-rearing behaviors; however, we were also interested in changes in parents' sense of stress, competence, and understanding of childrearing.

1.2.1. Child outcomes

In our sample, studies typically examined two classes of child outcomes: child behavior (e.g., compliance, problematic behaviors) and child adjustment (e.g., self-esteem, affect). Although child adjustment may improve with desirable changes in child conduct, this was considered a secondary effect of parent training. Therefore, effect size statistics was only computed for measures of child behavior whereas child adjustment measures were excluded.

Measures of child behavior are typically based on the child's comportment while under either parental or school supervision. Because the primary focus of parent training is to increase parents' ability to manage child behaviors while under their supervision, effect sizes from school or teacher reports were not used. Child behavior outcomes were typically assessed by parent-report measures and/or observational methods completed by research teams. Examples of parent report measures of child conduct included in our sample were the Eyberg Child Behavior Inventory (Eyberg & Robinson, 1983), the Externalizing Scale of the Child Behavior Checklist (Achenbach & Edelbrock, 1983), and the Parent Daily Reports (Chamberlain & Reid, 1987). Examples of observational methods used by research teams included the Dyadic Parent–Child Interactive Coding System (Robinson & Eyberg, 1978) and the Interpersonal Behavior Construct Scale (Kogan & Gordon, 1975). If measures assessing both child adjustment and child behavior scales were not separated by factor scores, they were not entered into effect size calculations. Measures which only assessed symptoms associated with Attention-Deficit Hyperactivity Disorder were not entered into effect size calculations. Thus, only indicators of children's comportment while under parents' supervision were included.

1.2.2. Parent outcomes

In our sample, studies typically examined one or more of three classes of parent outcomes: parent behavior (e.g., praise, spanking), parental perceptions of parenting (e.g., parent-related stress, confidence in parenting), and general adjustment (e.g., depression, anxiety). Because parent training primarily focuses on changing parents' behaviors and perceptions, effect sizes were only computed from measures assessing these two constructs. Measures of general adjustment were not included because they were considered distal to the goals of parent training.

We computed effect sizes from measures of parent behavior based on parental self-report and, at times, direct observations from a researcher. Self-report measures included broad band instruments, such as the Parenting Scale (Arnold, O'Leary, Wolff, & Acker, 1992), and narrow band practices, such as frequency of spanking and praise. Examples of observational methods used by research teams included the Dyadic Parent–Child Interactive Coding System (Robinson & Eyberg, 1981) and the Interpersonal Behavior Construct Scale (Kogan & Gordon, 1975). Measures of parental perceptions were derived from self-report instruments, such as the Parenting Sense of Competence scale (Gibaud-Wallston & Wandersman, 1978; Johnston & Mash, 1989), the Parent Attitude Survey

Table 1
Articles included in the analysis

Study	<i>n</i> ^a	Moderators ^b	Effect sizes ^c		
			Child behavior	Parent behavior	Parent perceptions
Anastopoulos, et al. (1993)	19,15	B/-/2/2/1/1/18	– (–)	– (–)	1.26 (1.13)
Barkley et al. (2000)	39,42	B/1/1/1/1/35	–0.11 (–)	–0.06 (–)	0.18 (–)
Barkley et al. (2000)	40,42	B/1/1/1/3/49	–0.03 (–)	0.03 (–)	0.24 (–)
Behan, et al. (2001)	26,14	B/-/2/1/1/1/20	0.21 (0.55)	– (–)	0.38 (0.27)
Bor et al. (2002)	15,27	B/1/1/2/1/1/33	0.77 (1.34)	0.67 (0.88)	0.95 (1.10)
Bor et al. (2002)	21,27	B/1/1/2/1/1/43	0.97 (1.24)	0.50 (1.04)	0.81 (0.70)
Brestan et al. (1997)	16,13	B/1/1/2/1/1/47	1.11 (–)	– (–)	– (–)
Connell, et al. (1997)	12,11	B/-/1/4/1/1/17	1.42 (–)	1.09 (–)	0.89 (–)
Csapo and Friesen (1979)	7,6	B/-/-/U/5/1/1	0.98 (–)	– (–)	– (–)
Cunningham et al. (1995)	35,42	B/-/1/2/1/2/20	0.07 (–0.21)	–0.27 (–0.19)	0.35 (0.26)
Cunningham et al. (1995)	35,42	B/-/1/1/1/2/20	0.24 (0.06)	0.14 (0.09)	0.18 (0.42)
Dishion and Andrews (1995)	23,36	B/1/3/1/1/1/52	0.38 (–0.16)	0.41 (–)	– (–)
Dishion and Andrews (1995)	29,36	B/1/3/1/1/2/52	0.11 (0.05)	0.55 (–)	– (–)
Dishion and Andrews (1995)	25,36	B/1/3/4/1/2/39	0.13 (–0.01)	0.28 (–)	– (–)
Dubey et al. (1983)	16,5	B/3/2/1/1/1/–	1.11 (1.00)	0.00 (–)	0.00 (–)
Dubey et al. (1983)	10,5	N/3/2/1/1/1/–	1.02 (1.30)	0.00 (–)	0.00 (–)
Eyberg et al. (1995)	8,5	B/1/1/2/1/1/–	1.41 (–)	1.51 (–)	– (–)
Forgatch and Toobert (1979)	6,6	B/3/1/2/2/1/17	0.93 (0.80)	– (–)	– (–)
Gordon-Rosen and Rosen (1984)	17,13	N/1/3/1/2/1/–	0.39 (0.63)	– (–)	– (–)
Gross et al. (1995)	11,12	B/3/1/1/1/1/–	– (0.44)	– (0.42)	– (0.51)
Hall and Rose (1987)	6,7	N/3/3/1/3/1/–	0.64 (–)	0.68 (–)	– (–)
Hall and Rose (1987)	7,7	N/3/3/1/3/1/–	0.61 (–)	0.57 (–)	– (–)
Hamilton and MacQuiddy (1984)	9,9	B/3/1/4/2/1/33	1.42 (1.79)	– (–)	– (–)
Hamilton and MacQuiddy (1984)	9,9	B/3/1/4/2/1/33	0.72 (0.93)	– (–)	– (–)
Hemphill and Littlefield (2001)	102,37	B/-/2/1/1/3/34	0.74 (0.58)	– (–)	– (–)
Hinkle et al. (1980)	50,50	N/-/-/1/2/1/–	– (–)	1.01 (–)	1.62 (–)
Hoath and Sanders (2002)	9,11	B/-/2/1/1/1/67	0.44 (1.59)	0.52 (0.82)	1.12 (0.60)
Hood and Eyberg (2003)	–,23	B/1/1/2/1/1/–	– (1.38)	– (–)	– (1.13)
Hughes and Wilson (1989)	14,14	B/1/3/2/1/2/38	0.62 (–)	– (–)	–0.56 (–)
Hughes and Wilson (1989)	14,14	N/1/3/2/1/2/38	0.09 (–)	– (–)	–0.17 (–)
Huhn and Zimpfer (1989)	10,8	N/-/-/1/2/1/–	– (–)	– (–)	1.04 (–)
Irvine et al. (1999)	88,112	B/-/3/1/2/1/33	0.19 (0.52)	0.35 (0.54)	– (–)
Jang (2000)	14,16	N/-/-/1/2/1/–	– (–)	– (–)	0.26 (–)
Kacir and Gordon (1999)	19,19	B/-/3/4/3/1/32	0.33 (0.58)	0.12 (0.15)	1.18 (–)
Kanigsberg and Levant (1988)	15,12	B/3/-/1/2/1/07	0.00 (–0.03)	– (–)	0.27 (0.51)
Kanigsberg and Levant (1988)	7,12	N/3/-/1/2/1/43	–0.08 (–0.01)	– (–)	0.53 (0.75)
Kazdin et al. (1987)	20,14	B/-/2/2/1/3/55	1.19 (1.39)	– (–)	– (–)
MacKenzie and Hilgedick (1999)	16,15	B/3/1/2/2/1/05	– (0.51)	0.39 (0.26)	0.60 (0.76)
MacKenzie and Hilgedick (1999)	15,15	B/3/1/2/2/1/05	– (0.21)	0.01 (–0.06)	0.34 (0.40)
Magen and Rose (1994)	19,19	B/3/2/1/2/1/21	–0.15 (0.30)	0.82 (0.42)	– (–)
Magen and Rose (1994)	18,19	B/3/2/1/2/1/50	0.30 (0.15)	0.72 (0.00)	– (–)
Martinez and Forgatch (2001)	88,52	B/1/2/1/-/1/100	–0.08 (0.08)	–0.05 (0.32)	– (–)
Mullin et al. (1994)	39,40	B/-/2/1/2/1/–	0.35 (0.15)	– (–)	– (–)
Myers et al. (1992)	109,64	B/1/-/1/2/1/73	–0.03 (–)	0.20 (–)	– (–)
Nicholson et al. (1998)	20,20	N/3/1/1/2/1/–	0.81 (–)	0.12 (–)	– (–)
Odom (1996)	10,10	B/1/-/1/1/1/70	– (–)	– (–)	0.58 (–)
Packard et al. (1983)	7,7	B/-/1/4/2/1/30	– (–)	– (1.13)	– (–)
Patterson et al. (1982)	10,9	B/1/2/2/1/2/50	1.05 (–)	– (–)	– (–)
Pinsker and Geoffrey (1981)	13,14	B/-/-/1/2/1/00	0.85 (–)	0.62 (–)	– (–)
Pinsker and Geoffrey (1981)	13,14	N/-/-/1/2/1/00	0.50 (–)	0.82 (–)	– (–)
Pisterman et al. (1992a)	23,22	B/-/1/5/1/1/09	0.34 (0.80)	0.74 (0.65)	– (–)
Pisterman et al. (1992b)	46,45	B/-/1/5/1/1/15	– (–)	– (–)	0.53 (0.55)
Pisterman et al. (1989)	23,23	B/-/1/5/1/1/17	0.64 (0.76)	1.06 (1.12)	– (–)
Raue and Spence (1985)	9,8	B/-/3/1/1/2/–	1.02 (1.89)	– (–)	0.62 (0.01)
Raue and Spence (1985)	9,8	B/-/3/2/1/2/–	0.82 (1.76)	– (–)	0.59 (0.10)

Table 1 (continued)

Study	<i>n</i> ^a	Moderators ^b	Effect sizes ^c		
			Child behavior	Parent behavior	Parent perceptions
Root and Levant (1984)	30,15	N/1/-/1/2/1/-	- (-)	- (-)	0.00 (-0.02)
Schuhmann et al. (1998)	34,30	B/3/1/2/1/1/38	1.10 (1.39)	1.51 (-)	1.21 (0.83)
Scott and Stradling (1987)	27,28	B/1/-/1/1/1/40	0.78 (-)	- (-)	- (-)
Scott et al. (2001)	73,27	B/-/-/1/1/1/-	0.83 (-)	0.76 (-)	- (-)
Sheeber and Johnson (1994)	20,20	B/3/1/1/3/1/13	0.16 (0.51)	- (-)	0.67 (0.65)
Sonuga-Barke et al. (2001)	30,20	B/3/1/2/1/1/-	0.25 (0.34)	- (-)	0.73 (0.42)
Spaccarelli et al. (1992)	21,16	B/3/-/1/2/1/40	1.10 (-)	1.20 (-)	1.02 (-)
Spaccarelli et al. (1992)	16,16	B/3/-/1/2/1/40	0.75 (0.65)	0.98 (0.29)	0.63 (0.08)
Summerlin and Ward (1981)	26,24	N/-/-/1/2/1/-	-0.12 (-)	- (-)	- (-)
Thompson et al. (1996)	39,27	B/-/2/1/1/1/26	0.33 (-)	- (-)	0.87 (-)
Tucker et al. (1998)	10,6	B/3/1/1/1/1/-	0.31 (0.44)	0.54 (0.42)	0.32 (0.51)
Webster-Stratton (1982a)	16,19	B/3/1/1/3/1/-	0.43 (0.75)	1.51 (1.95)	0.33 (0.45)
Webster-Stratton (1982b)	16,19	B/3/1/1/2/1/-	0.54 (0.70)	- (-)	- (-)
Webster-Stratton (1984)	11,11	B/1/1/2/1/1/55	0.73 (1.45)	0.77 (0.49)	- (-)
Webster-Stratton (1984)	13,11	B/1/1/1/1/1/54	0.74 (1.49)	1.06 (0.79)	- (-)
Webster-Stratton (1990)	26,19	B/3/-/6/1/1/39	0.46 (-)	0.29 (-)	0.85 (-)
Webster-Stratton (1990)	21,19	B/3/-/4/1/1/39	0.49 (-)	0.53 (-)	1.05 (-)
Webster-Stratton (1992)	96,71	B/-/1/4/1/1/34	0.49 (1.13)	0.52 (0.62)	0.42 (0.44)
Webster-Stratton (1998)	109,112	B/1/1/1/3/3/53	0.09 (0.01)	0.34 (0.29)	- (-)
Webster-Stratton and Hammond (1997)	43,40	B/-/-/1/1/1/39	0.81 (0.92)	0.43 (0.64)	1.06 (1.23)
Webster-Stratton and Hammond (1997)	36,40	B/-/-/1/1/2/36	0.62 (0.77)	0.30 (0.54)	0.71 (0.80)
Webster-Stratton et al. (1988)	47,48	B/-/1/1/1/1/31	0.71 (-)	0.70 (-)	0.41 (-)
Webster-Stratton et al. (1988)	45,48	B/-/1/4/1/1/31	0.54 (-)	0.62 (-)	0.22 (-)
Webster-Stratton et al. (1988)	38,48	B/-/1/1/1/1/31	0.63 (-)	0.63 (-)	0.24 (-)
Weiner et al. (1994)	52,74	B/1/-/2/-/1/-	- (-)	0.67 (-)	- (-)
Wolfe et al. (1988)	16,14	B/1/1/5/2/1/90	0.11 (0.68)	0.51 (-0.14)	- (-)
Wood and Davidson (1993)	13,11	N/-/-/1/2/2/-	0.25 (-)	0.66 (-)	0.12 (-)
Zangwill (1983)	5,6	B/1/1/2/1/1/74	1.18 (-)	1.51 (-)	- (-)

Dashes indicate that no data was reported. If a study compared multiple treatment groups to one control group, a listing for each treatment group was included. If studies reported a variety of “*n*’s”, the smallest value was used and reported.

^a The first value refers to the number of parents in the treatment group, the second value is the number of parents in the control group.

^b The first moderator is type of treatment (B=behavioral, N=nonbehavioral); the second moderator is SES (1=low, 3=middle); the third moderator is child age (1=less than 60 months, 2=78–120 months, 3=144 months and over); the fourth moderator is treatment delivery (1=group, 2=individual, 3=home-based, 4=self-directed, 5=individual and other); the fifth moderator is clinical symptom level (1=clinical, 2=not clinical, 3=mixed); the sixth moderator is treatment recipient (1=parent, 2=parent and child, 3=multi-systemic); the seventh moderator is the percentage of single parents in the study.

^c The first effect size in each column refers to immediate post-test, the effect size in parentheses refers to the follow-up effect.

(Hereford, 1963), or the Parenting Stress Index (Abidin, 1986). Additionally, some instruments examined parents’ knowledge about child rearing, such as the Parenting Knowledge Test (Gordon, 1994). We did not compute effect sizes from measures assessing satisfaction with a particular parent training program.

1.3. Coding studies

In addition to calculating effect sizes, participant characteristics and features of parent training interventions were coded to assess their potential role as moderating variables.

1.3.1. Participant characteristics

We coded four participant characteristics: (a) age of the target child, (b) family SES, (c) severity level of undesirable child behaviors prior to beginning treatment, and (d) percentage of single parents in a sample.

Child age was initially coded on a continuous scale. Then, based on visual examination of the age distribution, three categorical groups were formed based on expected grade placement in school: *preschool* (average age ≤ 60 months), *elementary school* (78–120 months), and *middle school* (≥ 144 months). To ensure sufficient separation between the groups, nine studies were removed from age-related moderator analyses.

Family SES was coded into two groups, *disadvantaged* and *nondisadvantaged*, based on reports of family income, education, and, where available, occupation data. Some studies provided SES indices, such as the Hollingshead Index, and others reported that the typical family came from either low-or average-income groups.

Level of children's disruptive behaviors prior to entering treatment was coded into one of three categories: *clinical*, *nonclinical*, and *mixed*. Studies were coded as clinical if they targeted children with significantly elevated behavior problems or if the pretreatment score on a standardized measure of problematic behaviors was clearly in the clinical range. Studies were coded as nonclinical if the recruitment was from a general community sample or if there was no data to suggest elevated behavioral problems. Studies were coded as mixed when they did not target children with behavioral problems but reported data suggesting a subset, but not all, of the children evidenced significantly elevated levels of behavioral problems.

Lastly, percentage of participating single parents was coded. From this information, studies were categorized as possessing a relatively high or low percentage of single parents. Across all studies, those with the top 33% of single parents were coded as a *high percentage* study while all others were coded as a *low percentage* study.

1.3.2. Features of parent training programs

We coded six features of parent training programs: (a) theoretical underpinnings, (b) recipient of treatment, (c) mode of parent training delivery, and (d) study rigor. For studies reporting follow-up data we also coded (e) length of the follow-up assessment period and (f) whether follow-up assessments included a control group.

Parent training programs are guided by theory to explain the causes, supporting conditions, and ameliorative conditions associated with disruptive child behaviors. While we found diversity in the theoretical underpinnings and intervention strategies of parent training programs, we divided parent training programs into behavioral and nonbehavioral interventions. Serketich and Dumas (1996) provide an excellent overview of the assumptions of behavioral programs. To be coded as a behavioral parent training program, we adopted their third assumption, which states: "Therapy seeks to establish a shift in social contingencies such that children's prosocial behaviors obtain positive parental reinforcement, and their aversive behaviors are consistently punished or ignored" (p. 172). If a study included additional interventions that supplemented the teaching of social contingencies, it was still coded as a behavioral program.

Our sample included 14 studies in which the focus of training was on interventions other than social contingencies; these were considered nonbehavioral programs. Nonbehavioral programs emphasize the importance of healthy parent-child communication (e.g., empathic listening, not interrupting), respect for others, democratic parenting, child-centered cognitions, and problem-solving between the parent and child. In our sample, four studies were based directly on Parent Effectiveness Training (PET; Gordon, 1970), two were guided by Systematic Training for Effective Parenting (STEP; Dinkmeyer & McKay, 1976), and the others emphasized nonbehavioral strategies without a particular affiliation. Because of more stringent study eligibility criteria in the present study fewer nonbehavioral studies were included compared to the meta-analysis conducted by Cedar and Levant (1990).

The recipient(s) of treatment were coded as *parent only*, *parent and child*, and *multisystem*. In most cases parents were the only recipient of intervention. However, some programs offered additional treatment to the target child such as child therapy. In cases where a child participated with a parent during parent training and did not receive their own therapy process, the study was coded as parent only. We coded three primary modes of parent training delivery: *group*, *individual*, and *self-directed*. Some studies combined two of these three categories and were accordingly coded as a mixture. The nature of group and individual delivery is clear. By contrast, self-directed parent training is a less well-known delivery and includes interventions such as having parents read a parent-training manual individually, witnessing a parent-training video, or participating in parent training through a program run on a computer.

Each study was coded for methodological rigor on a 7-point scale. A study could receive 2 points for equivalence between treatment and control groups (i.e., random assignment=2 points, equivalency=1 point, not mentioned or not equivalent=0 points). For each of the other study features, a study received a score of "1" for including the feature or "0" for not including it. The other study features included the use of multiple methods of assessment (i.e., self-report and observational methods), clarity in describing the treatment intervention, inclusion of necessary statistics, use of standardized or well-known measures, and use of a treatment manual.

To assess durability of parent training, the number of months that elapsed between treatment completion and later assessment points was coded. Follow-up results were coded into two time periods: 1–6 months or 7–12

months. Some follow-up studies collected data that compared outcomes to a control group whereas others did not.

1.3.3. Reliability

All studies were independently coded by the first and second authors. Intra-class correlation alphas and Cohen's kappa (K) were computed for continuous and dichotomous data, respectively. Among the continuous variables, alphas were 0.99 for child age, percentage of single mothers, and follow-up length, and 0.82 for study rigor. For the dichotomous variables, K 's were 0.89 for theoretical underpinnings, 0.83 for pretreatment level of problematic child behaviors, 0.81 for family SES, 0.99 for use of a control group at follow-up, 0.86 for treatment delivery mode, and 0.94 for recipient of treatment. The first author calculated effect sizes for each of the dependent variables included in the study and the second author recalculated each of the effect sizes to determine accurate calculation. Disagreements were resolved through consulting the studies.

1.4. Effect size organization and calculation

To organize our findings six separate meta-analytic data files were constructed. This was done by crossing the three outcome constructs (i.e., child behavior, parent behavior, and parental perceptions) with the two time frames (i.e., immediate and follow-up effects). Each study could potentially contribute effect sizes to all six files. Many studies provided multiple measures within one or more of the three outcome constructs. In this case, we took the average effect from the multiple measures to limit an individual study's contribution to a given construct (Lipsey & Wilson, 2001). That is, any given study contributed at most one effect size to each file.

We used Cohen's d as the measure of effect size (see Lipsey & Wilson, 2001). Cohen's d reflects the differences between the post-treatment means of the treatment group and the control group divided by the pooled standard deviation, adjusted for sample size. Thus, d represents the difference between the treatment and control group expressed in standard deviation units. Effect size computations and summary analyses were done using a meta-analytic software program, DSTAT (Johnson, 1993). Given our selection criteria, only studies which provided means and sufficient information to derive standard deviations were included; that is, d was not directly calculated from t tests, F tests, or p values. If studies indicated nonsignificant findings we assigned an effect size of 0.00. Some indices of interest examined "desirable" behaviors while others examined "undesirable" behaviors. An increase in desirable or a decrease in undesirable behaviors in the treatment group, relative to the control group, resulted in a positive d statistic. A decrease in desirable or an increase in undesirable behaviors in the treatment group, relative to control group, resulted in a negative d statistic.

Within each data file, we tested for and corrected extreme values as recommended by Lipsey and Wilson (2001). Correcting for extreme values in quantitative reviews is consistent with the purpose of meta-analyses, specifically to "arrive at a reasonable summary of the quantitative findings of a body of research studies" (Lipsey & Wilson, 2001, p. 107). This was done by identifying d values that were greater than 2 SD from the mean of the sample of d values obtained within a particular construct and time frame. Values above 2 SD units were assigned a value equivalent to 2 SD units from the mean (i.e., Windorizing). Ten effect sizes from studies examining the immediate impact of parent training and two from follow-up studies were Windorized.

2. Results

2.1. Study characteristics

Table 2 presents descriptive statistics for behavioral and nonbehavioral parent training programs. Of the 83 experimental groups, 69 involved behavioral parent training programs while 14 involved nonbehavioral programs. The mean age of children from the 73 experimental groups which reported sufficient information was 81.42 (SD=42.23) months. The mean ages for the three age categories we created were 48.26 ($n=36$, SD=9.13) months for the preschool group, 99.33 ($n=12$, SD=11.74) months for the elementary school group, and 155.55 ($n=12$, SD=9.95) months for the middle school group. Behavioral programs focused more on younger children ($n=63$; $M=74.34$ months, SD=37.81 months) compared to nonbehavioral programs ($n=10$;

Table 2
Descriptive statistics

	Number of contributing effect sizes	
	Behavioral	Nonbehavioral
Experimental groups	69	14
Child age (months)		
60 or less	35	1
78–120 months	11	1
144 or more	8	4
Missing (removed) ^a	6 (9)	8
Socioeconomic status		
Disadvantaged	21	3
Nondisadvantaged	21	5
Missing	27	6
Pretreatment symptom level		
Clinical	45	2
Nonclinical	18	10
Mixed	4	2
Missing	2	–
Percentage of single parents		
Bottom 2/3 of studies	39	2
Top 1/3 of studies	16	1
Missing	14	11
Treatment recipient		
Parent only	58	12
Parent and child	8	2
Multisystem	3	–
Treatment delivery		
Group	36	13
Individual	18	1
Group and individual	5	–
Self-directed	9	–
Self-directed and individual	1	–

^a Removed to create the three age groups; see Method.

$M=126.03$ months, $SD=43.13$ months), $t=3.94$, $p<0.01$. The mean percentage of single parents participating in parent training programs was 36.30 ($SD=20.78$) across the 57 studies which reported such data. For the relatively high percentage group (i.e., those in about the top 33% of studies) the mean percentage of single parents was 59.22 ($n=18$, $SD=16.46$), while it was 25.73 ($n=39$, $SD=12.27$) for the relatively low percentage group.

Rigor ratings for nonbehavioral programs ($M=4.64$, $SD=1.15$) were significantly lower than those of behavioral programs ($M=6.16$, $SD=1.11$), $t(78)=4.65$, $p<0.01$. Rigor ratings were not significantly correlated with changes in child or parental behavior immediately following treatment or at the follow-up period (average $r=0.10$). On average, behavioral parent training programs offered 9.77 ($SD=3.81$) sessions and nonbehavioral parent training programs offered 7.14 (1.66) sessions, $t(75)=2.52$, $p<0.05$. Behavioral parent training programs averaged 14.74 ($SD=8.16$) hours of face-to-face contact with parents while nonbehavioral programs averaged 16.00 ($SD=4.38$), $t(56)=0.43$, ns. Time in treatment and the number of sessions were not significantly correlated with child or parents outcomes (average r 's = -0.03 and 0.09 , respectively). Among studies which collected data on the long-term effects of parent training, the average length of follow-up was 7.72 months ($n=56$, $SD=8.30$).

2.2. Meta-analytic strategy

Within immediate and follow-up assessment periods overall statistics are presented first, followed by moderator analyses. Moderator analyses are typically pursued when a set of studies is not homogeneous. Homogeneity was tested using the *within-class goodness-of-fit* statistic, or Q_w (Johnson, 1993). A significant Q_w statistic suggests heterogeneity within a set of studies and the need for moderator analyses. Statistical differences between categories

Table 3
Immediate effects of parent training

	<i>d</i>	<i>k</i>	95% C.I.	<i>Q_w</i>	<i>p</i>	<i>Q_b</i>
Child behavior	0.42	68	0.35/0.49	101.84	0.01	
Behavioral	0.42	59	0.35/0.49	99.31	0.01	
Nonbehavioral	0.44	9	0.16/0.71	4.52	0.87	0.01, <i>p</i> =0.92
Parent behavior	0.47	51	0.40/0.54	90.81	0.01	
Behavioral	0.45	44	0.38/0.53	82.71	0.01	
Nonbehavioral	0.66	7	0.40/0.93	7.16	0.41	2.21, <i>p</i> =0.14
Parental perceptions	0.53	48	0.44/0.61	91.81	0.01	
Behavioral	0.53	38	0.44/0.63	54.92	0.07	
Nonbehavioral	0.48	10	0.27/0.70	36.76	0.01	0.18, <i>p</i> =0.67

d=effect size. *k*=number of studies. C.I.=confidence interval. The *Q_w* statistic is calculated using *k*−1 degrees of freedom and estimates homogeneity. The *Q_b* statistic compared behavioral and nonbehavioral effect sizes using 1 degree of freedom.

within participant and parent training program characteristics were tested with the *between-class goodness-of-fit* statistic, or *Q_b*. A significant *Q_b* statistic indicates the magnitude of the effect differs between moderator variable categories.

2.3. Immediate effects

Among the three outcome constructs, 68 effect sizes were specific to the child behavior construct, 51 to the parent behavior construct, and 48 to the parental perceptions construct with respective composite *d*'s of 0.42, 0.47, and 0.53 (see Table 3). Each overall composite effect size contained significant heterogeneity.

Behavioral and nonbehavioral oriented parent training programs did not differ significantly in their impact on child or parental functioning (see Table 3). Because there were so few nonbehavioral parent training programs and because the outcomes from these programs were generally homogeneous, we pursued additional moderator analyses only for behavioral parent training programs. Despite a nonsignificant *Q_w* for parental perceptions within the behavioral parent training programs, exploratory moderator analyses were performed given that little information on this topic exists in the literature and there was adequate number of studies.

For the last level of moderator analyses, we simultaneously present four family characteristics (i.e., children's age, family SES, children's symptom level at pretreatment, relative percentage of single parents) and two parent training program variables (i.e., treatment recipient, treatment delivery mode) because an established hierarchy among these variables does not exist.³ Table 4 provides descriptive and inferential statistics. The number of studies contributing an effect size within moderator levels differs because not all studies gathered data within each construct.

2.3.1. Child behavior

Within the child behavior construct, three of the four family characteristic moderators significantly influenced outcomes. Economically disadvantaged children did not realize the beneficial outcome of their nondisadvantaged counterparts, *Q_b*=7.88, *p*<0.01. Also, children from studies that included clinically significant levels of disruptive behaviors prior to treatment evidenced more change than those from studies without clinically elevated symptoms or mixed groups, *Q_b*'s=5.62 and 6.38 (*p*'s<0.05), respectively. As expected, children in groups with a relatively high percentage of single parents did not change as much as those with relatively low percentage of single parents, *Q_b*=5.11, *p*<0.01. Contrary to expectations, improvement in child behavior was not significantly influenced by child age though effect sizes were greatest for younger children and lowest for older children. With regard to features of the parent training, the recipient of parent training treatment did not influence child outcomes; however, the mode by which treatment was delivered did influence outcomes. Parents who participated only in individually delivered parent training changed significantly more than those who participated only in group delivered parent training, *Q_b*=10.08,

³ There were 12 instances where a set of studies within a moderator variable evidenced significant heterogeneity and was composed of 15 or more studies (see Table 4). In traditional meta-analytic procedures, further moderator analyses are pursued until a set of studies is either homogeneous or too small to conduct additional analyses.

Table 4

Moderators associated with immediate effects within behavioral treatments

	Outcome construct								
	Child behavior			Parent behavior			Parental perceptions		
	<i>d</i>	<i>k</i>	<i>Q_w</i>	<i>d</i>	<i>k</i>	<i>Q_w</i>	<i>d</i>	<i>k</i>	<i>Q_w</i>
<i>Child age (months)</i>									
60 or less	0.44	29	49.24*	0.48	24	58.16*	0.45	20	22.74
78–120	0.31	10	19.65*	0.24	5	7.94	0.75	5	5.68
144 or more	0.27	8	4.82	0.35	5	1.21	0.45	4	10.84*
<i>Socioeconomic status</i>									
Disadvantaged	0.24 _b	18	35.50*	0.34 _b	16	24.21	0.38 _a	7	15.01*
Nondisadvantaged	0.54 _b	17	20.75	0.75 _b	12	22.57*	0.72 _a	14	13.24
<i>Child's symptom level at pretreatment</i>									
Clinical	0.52 _b	40	51.78	0.48	29	53.15*	0.53	29	47.99*
Nonclinical	0.31 _{b-clinical}	14	19.80	0.47	10	10.75	0.50	6	3.18
Mixed	0.22 _{b-clinical}	4	3.46	0.42	3	8.84*	0.70	3	2.93
<i>Single parent (relative percentage)</i>									
Bottom 2/3	0.45 _a	29	42.43	0.43	24	46.05*	0.53	24	44.13*
Top 1/3	0.24 _a	16	30.79*	0.39	14	22.59	0.60	6	5.36
<i>Treatment recipient</i>									
Parent only	0.47	47	71.13*	0.54 _{a,b}	37	62.55*	0.59 _a	31	40.16
Parent and child	0.31	8	7.09	0.18 _a	5	6.26	0.33 _a	6	8.56
Multisystem	0.29	4	14.82*	0.25 _b	2	1.42	0.24	1	–
<i>Treatment delivery</i>									
Group	0.34 _b	33	58.94*	0.40	24	41.87*	0.47	20	21.18
Individual	0.69 _b	13	16.69	0.55	10	30.18*	0.67	11	21.49*
Group and individual	0.43	4	1.92	0.78	3	1.26	0.53	1	–
Self-directed	0.51	8	8.70	0.47	6	4.35	0.51	5	7.40
Self-directed and individual	0.48	1	–	0.52	1	–	1.03	1	–

ES=effect size. *k*=number of studies. Subscripts within a column for a given moderator reveal a significant contrast; subscripts "a" and "b" are used for $p < 0.05$ and 0.01 , respectively. * $p < 0.05$.

$p < 0.01$. There was no significant difference between self-directed parent training and those using face-to-face interventions.

2.3.2. Parent behavior

Within the parent behavior construct, only socioeconomic status and recipient of treatment moderated the impact of parent training. As expected, family adversity significantly undermined positive changes in parental behavior, $Q_b = 11.65$, $p < 0.01$. Children's age, level of behavioral problems prior to treatment, and the relative percentage of single parents in a study did not significantly influence positive changes in parental behavior. Delivering parent training through group, individual, self-directed, or a combination of these modes did not significantly influence changes in parental behavior. However, who received treatment was associated with changes in parents' behavior. Programs where the parent was the sole recipient of treatment evidenced more positive change than those which included separate interventions for the child ($Q_b = 9.14$, $p < 0.01$) or a multisystemic approach ($Q_b = 5.00$, $p < 0.03$).

2.3.3. Parental perceptions

Within the parent perception construct, only socioeconomic status and recipient of treatment significantly moderated the effects of parent training. Disadvantaged families experienced less desirable change compared to their nondisadvantaged counterparts, $Q_b = 6.42$, $p < 0.02$. Also, parents' perceptions changed more when only parents were involved in the intervention compared to when parents and children were involved, $Q_b = 3.89$, $p < 0.05$. Thus, positive changes in parental perceptions were not significantly moderated by children's age, level of behavioral

problems prior to treatment, the relative percentage of single parents in a study, or the mode of treatment delivery. In addition to being a “primary moderator” of parental perceptions, socioeconomic status also moderated effects of sample and treatment characteristics where significant heterogeneity existed.⁴

2.4. *Helping disadvantaged families*

Children and parents from disadvantaged families benefited less from parent training compared to their non-disadvantaged counterparts. To determine whether demographic or treatment variables enhanced effectiveness within the behavioral programs that treated disadvantaged families we conducted further moderator analyses within these 20 studies. One treatment variable enhanced the effectiveness of treatment for children and parents: mode of treatment delivery. Children whose parents received individual parent training ($k=8$, $d=0.76$) benefited more than those whose parents received group parent training ($k=10$, $d=0.12$), $Q_b=16.63$, $p<0.01$. Similarly, parents evidenced more desirable behavioral changes from individual parent training ($k=6$, $d=0.70$) compared to group parent training ($k=8$, $d=0.22$), $Q_b=10.20$, $p<0.01$. For parental perceptions, the difference between individual ($k=4$, $d=0.59$) and group delivered ($k=3$, $d=0.25$) did not reach statistical significance, $Q_b=2.06$, ns, though the difference appears to be meaningful.

2.5. *Follow-up effects*

Several studies examined the long-term benefit of parent training programs by gathering data months after treatment had ended. Unfortunately, only 4 studies examined the long-term impact of nonbehavioral parent training programs. Of these, 3 provided data on child behavior ($d=0.52$) and 3 provided data on parental perceptions ($d=0.04$), and no study reported on the long-term impact on parenting behavior. Given the paucity of studies examining the long-term impact of nonbehavioral parent training programs, comparisons were not made with behavioral parent training programs. The following results are from behavioral parent training programs only.

2.6. *Follow-up effects: behavioral programs*

Across the three outcome constructs, 44 effect sizes were specific to the child behavior construct, 26 to the parent behavior construct, and 22 to the parental perceptions construct (see Table 5).^{5,6} We did not present composite d 's for the three constructs because combining the results from designs employing a control group and those not using a control group is akin to mixing “apples” and “oranges” and was deemed inappropriate (Mullen, 1989). Moreover, we do not believe the Q_b values are meaningful because one conveys change within treatment groups while the other communicates the difference between treatment and control groups.

We reasoned that studies which employed a control group at follow-up should permit greater insight into the relative benefit of providing behavioral parent training versus not providing it across time. Thus, further analyses were pursued only for studies in which a control group was employed. The d 's for the child behavior (0.21) and parent behavior (0.25) constructs were both in the small range, while the parental perceptions construct (0.45) was in the

⁴ The heterogeneity within the child behavior among studies of disadvantaged families was reduced by using treatment delivery as an additional moderator, as discussed in Results. Because SES was the most salient moderator, it was used to determine if heterogeneity could be reduced in the 11 instances where it remained. We did this by dividing the set of studies evidencing heterogeneity into disadvantaged and nondisadvantaged groups. Of these 22 groups of studies, 15 no longer evidenced heterogeneity. The means were all in the predicted direction, with lower effect size values for disadvantaged compared to nondisadvantaged groups. Because the pattern of findings mirrors the more general finding of SES status already presented in Table 4, we do not report the specific findings.

⁵ Follow-up data were collected at varying intervals and, at times, on multiple occasions. If multiple follow-up data collection periods were present, we computed effect sizes based on the most lengthy collection period with one exception. In our review, all studies but two examined long-term effects of less than or equal to 1-year from the completion of parent training. Of these, Martinez and Forgatch (2001) also collected long-term data 1-year following completion of parent training and this value was used to be consistent. The other study, conducted by Hood and Eyberg (2003), presented follow-up data from between 3 and 6 years following treatment with effect sizes beyond the “large” classification (see Table 1); however, these findings were derived without comparisons to a control group.

⁶ For studies which excluded a control group at follow-up, d was computed using a within-subjects design by subtracting the original treatment group's follow-up score from their original pre-test score which was then divided by a within-subjects pooled standard deviation.

Table 5

Follow-up effects for behavioral treatments: comparison to control group or pre-post design

	<i>d</i>	<i>k</i>	95% C.I.	Q_w	<i>p</i>
<i>Child behavior</i>					
Control group	0.21	21	0.08/0.33	29.36	0.11
Pre-post only	0.87	23	0.74/0.99	35.69	0.05
<i>Parent behavior</i>					
Control group	0.25	14	0.11/0.40	17.91	0.21
Pre-post only	0.64	12	0.48/0.80	15.57	0.21
<i>Parental perceptions</i>					
Control group	0.45	9	0.24/0.65	1.73	0.99
Pre-post only	0.62	13	0.45/0.78	22.53	0.05

d=effect size. *k*=number of studies. C.I.=confidence interval. The Q_w statistic is calculated using *k* – 1 degrees of freedom.

small to moderate range. None of the three constructs evidenced significant heterogeneity. Given the homogeneity of effects and small sample size, further moderator analyses were not justified.

3. Discussion

Results from our meta-analysis suggest that, in general, parent training designed to modify disruptive child behavior is a robust intervention producing effect sizes in the moderate range immediately following treatment. Up to 1 year following the completion of parent training effects remained meaningful, but were small in magnitude. Unfortunately, understanding the durability of effects of nonbehavioral programs was compromised because only four studies assessed such a relationship. While the effects of behavioral interventions were robust, our results also suggest attention should be paid to the interaction between participant characteristics and program features to maximize the likelihood of success. Following a discussion of several practical implications of our findings from behavioral parent training studies, several assumptions guiding parent training implementation will be considered.

3.1. Practical implications

Consistent with results of many primary studies and theories of change, parents and children facing higher levels of adversity did not benefit from parent training as much as their nondisadvantaged counterparts. Indeed, in our study financial disadvantage was the most salient moderator of outcomes. By itself, this expected finding does little to guide intervention decisions. However, an important finding emerged when we investigated factors associated with success among financially disadvantaged groups: individually delivered behavioral parent training was far superior to group delivered behavioral parent training. Competing assumptions influence decisions on how to structure parent training and are relevant to delivering services to disadvantaged families. Families facing disadvantage frequently lack social support (Dumas & Wahler, 1983), and group delivered parent training is theorized to provide social support which in turn is expected to enhance the effectiveness of the intervention. On the other hand, individually delivered parent training can better tailor or individualize interventions to match the unique situation of a given family. In choosing between these competing influences, our data clearly side with the notion that interventions should be individually tailored for families facing financial disadvantage. While not the focus of this study and speculative in nature, it may be that the relative benefit of social support derived from group members is minor compared to the benefit of gaining a more thorough understanding of your own child's behavior and an individualized plan for managing that behavior. Additionally, the presumed benefit of social support found in groups may be weighed against the one-on-one relationship with the person delivering individual parent training and the increased flexibility of this delivery mode.

Different stakeholders may take issue with the notion that individually delivered parent training should be routinely provided for some groups. For example, insurance companies and agency administrators could argue that group parent training is more economical and extends the reach of service provision. There is a trend toward group-delivered parenting training interventions for children with disruptive behavior disorders because insurance companies are reluctant to pay for the treatment costs (Long, 1997). While group delivered parent training may be as efficacious as

individually delivered training for certain groups, such as with families experiencing minor difficulties and challenges, our results indicate this is not the case for disadvantaged families. We feel that mental health providers, who should value their clients' wellbeing over that of external agencies, should advocate for individually delivered parent training for economically disadvantaged families regardless of potential increases in short-term expenses.

A second practical finding is that including treatment components in addition to basic behavioral parent training did not result in detectable improvements in the outcomes we investigated. Despite conventional wisdom, more was not necessarily better. Indeed, evidence suggests that including separate child therapy may undermine positive outcomes for parents and children. However, such an inference is weakened by at least two factors. First, child therapy often targets children's cognitions and behaviors in relation to peers rather than parents (Miller & Prinz, 1990). As our dependent variables were limited to children's behavior with parents, the total effect of child therapy may not have been captured. Second, the number of studies involved in such comparisons was very small. Despite such cautions, it may be that including children in their own therapy process may change how parents view parent training. Rather than seeing themselves as the primary agent of change, parents may reason that because individual counseling is being offered to their child, it is their child who owns the problem and is, therefore, primarily responsible for change. While this may be more true for older children, theory and research do not support such a position for younger children.

A third practical finding is that self-directed parent training programs hold promise as they had effects on parents and children similar to other delivery modes. Self-directed programs are touted as being more economical and flexible than traditional approaches because they provide parents with literature, audio/visual material, or computer delivered information with minimal contact between the parent trainer and parent. Such factors may increase the accessibility of parent training to families who have difficulty accessing parent training through traditional means. For example, families living in rural areas or those who cannot gain transportation to a clinic could benefit from such programs. At this point, however, further research is needed to investigate the efficacy of self-directed programs in relation to established delivery modes.

3.2. Assumptions guiding parent training implementation

In addition to pragmatic considerations, our results offer information about several assumptions that guide decisions regarding parent training implementation.

A key objective of this study was to compare the outcomes from behaviorally oriented parent training programs with those of nonbehavioral programs. We expected that behavioral programs would show larger effects than nonbehavioral programs; however, the effect sizes were similar for behavioral and nonbehavioral interventions. Notably, there were differences between the behavioral and nonbehavioral studies included in our meta-analysis that make interpretation of this finding difficult: The majority of behavioral studies used clinical samples whereas the majority of nonbehavioral studies used nonclinical samples; the behavioral studies had higher rigor scores; there was little follow-up data for nonbehavioral programs; and the outcome measures selected by the authors differed for the behavioral and nonbehavioral studies. Thus, even though the measured effects of behavioral and nonbehavioral were similar in magnitude, our results do not suggest that behavioral and nonbehavioral programs are interchangeable. Our findings support the use of behavioral parent-training programs in the treatment of children with clinically significant behavior problems. In contrast, because nonbehavioral programs have yet to be evaluated with sufficient rigor with clinical populations, their use in treating clinically significant behavior problems is not supported at this time.

Another assumption guiding parent training implementation is the role of child age. In our study, child age did not systematically influence outcomes. Although greater benefits were found for younger children in behavioral parent training compared to older children, such differences were not statistically significant. At this point, how child age influences parent training outcomes is uncertain (see Dishion & Patterson, 1992). Counter to what we would predict, Serketich and Dumas (1996) reported a positive correlation between age and desirable outcomes whereas Cedar and Levant (1990) found no relationship. Further research may support theory that younger or older children benefit more from parent training, or it may be that parent training is simply robust against age effects.

A premise of parent training is that children are influenced by parental functioning and that modifying parental functioning will have long-lasting desirable changes for children and parents. To our knowledge our study is the first quantitative review to investigate the maintenance effects of behavioral parent training programs. Results indicate that child behavior, parent behavior, and parental perceptions were more adaptive at follow-up than before treatment and

families in the treatment groups maintained an advantage over families that received no treatment. However, the magnitude of the difference between treatment and control groups was reduced at follow-up compared to immediately following intervention. While these findings provide some support for the maintenance of treatment effects, the attenuation of effects over time also suggests that families with disruptive children may be best treated with continuing care models of service delivery (Kazdin, 2000) which may help parents better maintain their skills and modify them in response to developmental change.

Attenuation of effects over time highlights the need to program for generalization in behavioral programs. In large part, behavioral programs are based on external means of controlling child behavior through reinforcement and punishment. Maintenance of child behavior change therefore requires parents to persist with a highly structured approach to child management, a yeoman's task for a busy parent. However, maintenance of behavior change might be enhanced if these programs placed greater emphasis on the internalization of values. Committed compliance is optimized when parent–child relationships are healthy and parents supply explanations for rules and expectations (Grusec & Goodnow, 1994; Kochanska & Aksan, 1995). A few behavioral parent training programs include a relationship component (e.g., Brinkmeyer & Eyberg, 2003); greater emphasis on the quality of the relationship, as well as the inclusion of reasoning strategies, may promote more durable effects. Behavioral programs might also look to nonbehavioral parent training models, which focus on communication styles, respect, and problem-solving for clues on ways to enhance the maintenance of effects.

3.3. Conclusion

This is the third known quantitative review of parent training programs designed to modify disruptive child behaviors. Because our study included more than double the number of studies examined in other reviews, we were able to more thoroughly explore heterogeneity of outcomes and the role of moderators. Also, increased number of studies included in our meta analysis should provide a more stable picture of the effectiveness of parent training. That said, outcomes from behavioral parent training are likely less substantial than reported by Serketich and Dumas (1996) whereas outcomes from nonbehavioral programs are likely more substantial than reported by Cedar and Levant (1990). The results from moderator analyses give insight into pragmatic considerations in using parent training. For example, individually delivered parent training is far superior to group delivered parent training in helping families facing economic disadvantage. Also, there is no support for including supplements to basic parent training and parent training seems to be robust against age effects. Although outcomes from studies examining behavioral and nonbehavioral parent training programs were similar, behavioral programs should enjoy substantially more scientific respect because they have been more rigorously tested with clinical populations. That said, principles that guide nonbehavioral programs, such as a top-down approach, may promote the effectiveness of behavioral parent training. While there is support for the long-term influence of behavioral parent training, the benefits decrease over time.

As the general magnitude of effect from parent training seems has been clarified by the present and previous meta-analyses, future quantitative reviews of parent training programs may investigate the impact of modifications to standard parent training, the relative importance of factors associated with family engagement in parent training, or how various populations respond to parent training. Many studies we reviewed for inclusion in this study did not include a control group as they tested questions beyond the efficacy of parent training. For example, several studies investigated whether an enhancement component (e.g., self-control or social learning program; Wells, Griest, and Forehand, 1980; McMahon, Forehand, and Griest, 1981) improved outcomes over the standard treatment, while others examined factors associated with participation in parent training (e.g., Forehand et al., 1983; Miller and Prinz, 1990). Other studies examined parent training with specific populations, such as fathers (Bagner and Eyberg, 2003), or factors associated with satisfaction with parent training. Although parent training enjoys considerable empirical support in treating disruptive child behaviors, primary research and quantitative reviews promise to promote our understanding of how better to help children and parents through parent training efforts.

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Note. Articles led by an * were included in the analyses.

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