

Differential Effectiveness of Behavioral Parent-Training and Cognitive-Behavioral Therapy for Antisocial Youth: A Meta-Analysis

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Received December 10, 2004; revision received June 30, 2005; accepted August 17, 2005
Published online: 13 July 2006

Extended the findings from previous meta-analytic work by comparing the effectiveness of behavioral parent-training (BPT) and cognitive-behavioral therapy (CBT) for youth with antisocial behavior problems. Youth demographic variables were also examined as potential moderators of the effectiveness of these 2 types of interventions. Thirty BPT studies and 41 CBT studies met inclusion criteria for this meta-analysis. The weighted mean effect size (ES) for all interventions was 0.40. Youth age was found to moderate the outcome of the 2 interventions, with BPT having a stronger effect for preschool and school-aged youth and CBT having a stronger effect for adolescents. The results also indicate that there may be systematic differences in the outcomes associated with BPT and CBT when the setting of the intervention is considered, suggesting the need to carefully consider the effect of setting in future research. This study also highlights the need for outcome research dealing with more diverse populations and the better classification of research participants on different developmental trajectories of antisocial behavior.

KEY WORDS: antisocial behavior; behavioral parent-training; cognitive-behavioral therapy; children; adolescents.

Antisocial behavior, broadly defined to include overt (yelling, temper tantrums, aggression, physical destructiveness, non-compliance) and covert (lying, stealing) behavior problems, is common among youth. When the *Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition-Text Revision* (DSM-IV-TR; American Psychiatric Association, 2002) categorizes antisocial behavior within the Oppositional Defiant Disorder (ODD) and Conduct Disorder (CD) diagnostic categories, these behavior problems represent over 50% of the referrals to inpatient and outpatient child mental health clinics (Kazdin, 1995).

Research has identified different pathways along which youth may develop ODD or CD. For example,

the behaviors of individuals with ODD, which tend to be less severe in nature, typically emerge during childhood and usually no later than early adolescence (American Psychiatric Association, 2002). The behaviors of CD are more severe, including aggression directed toward people or animals, destruction of property, and a chronic pattern of theft or deceit. Two distinct developmental trajectories have been identified for CD (Moffitt, 1993). Youth with Childhood-Onset CD display antisocial behavior problems prior to adolescence. These youth typically experience neuropsychological impairments characterized either by impulsivity, high levels of emotional reactivity, and low verbal intelligence (Moffitt, 1993), or by a pattern of callous and unemotional traits characterized by low behavioral inhibition (Frick, 2001). Their behavior tends to be highly stable and predictive of adult delinquency, criminality, and substance abuse (Barkley, Fischer, Edelbrock, & Smallish, 1990; Loeber, 1982). Adolescent-Onset CD is characterized by an adolescence-limited period of rebelliousness and associations with deviant peers. These youth are less likely to show neuropsychological

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impairments, and in a majority of cases, the disorder remits by early adulthood (American Psychiatric Association, 2002; Moffitt, 1993).

The high prevalence rates and chronic course of antisocial behavior problems have led to the development of different interventions for youth and their families. Among these interventions, behavioral parent-training (BPT) and youth-based cognitive-behavioral therapy (CBT) have been the most extensively and rigorously studied (Kazdin & Weisz, 1998). BPT interventions typically aim to alter maladaptive parent-child interactions by training parents to use behavioral techniques to reinforce youth's prosocial behavior and decrease youth's antisocial behavior. CBT interventions teach non-violent problem-solving skills and target the maladaptive social-cognitive processes of antisocial youth such as perceptual distortions and hostile attributional biases. The effectiveness of these two intervention approaches has been demonstrated in a number of controlled psychotherapy outcome studies (see Hinshaw & Anderson, 1996).

The differential effectiveness of BPT and CBT for antisocial youth has yet to be established. Two recent meta-analytic studies computed mean outcome effect sizes (ESs) for BPT and CBT, respectively (reflecting between group comparisons of the therapy group with control conditions at post-treatment). Serketich and Dumas (1996) reported a mean ES for BPT ($d = .86$) that was notably higher than the mean ES for CBT ($d = .23$) reported by Bennett and Gibbons (2000). However, the different meta-analytic procedures employed in these two studies preclude a direct comparison of the ESs for the two interventions. For example, Bennett and Gibbons used procedures that were more conservative than those used by Serketich and Dumas. The present study corrected for this problem by using a uniform set of meta-analytic procedures to evaluate the differential effectiveness of BPT and CBT. Information on the differential responses of youth to BPT and CBT will help inform clinical practice by assisting clinicians in choosing the most effective intervention for their clients.

A secondary aim of this meta-analysis was to identify potential moderators of the effectiveness of BPT and CBT. A recent literature review by the American Psychological Association Division 12, Section on Clinical Child Psychology (now Division 53, Society of Clinical Child and Adolescent Psychology) identified a number of "well-established" and "probably efficacious" BPT and CBT treatments for youth with antisocial behavior problems (Brestan & Eyberg, 1998). This review also highlighted the lack of information on the contextual specificity of these two interventions. For example, it is unclear at this time whether males and females of different ages and eth-

nic backgrounds respond differently to treatment (Brestan & Eyberg, 1998). In an attempt to shed light on which antisocial youth might be most likely to benefit from BPT and CBT, this meta-analysis explored whether the effectiveness of these interventions was moderated by youth demographic variables.

Intervention Approaches

Parenting styles characterized by coercive parent-child interchanges, inconsistent discipline, and poor parental monitoring place youth at risk for the development of antisocial behavior problems (Compton, Snyder, Schrepferman, Bank, & Shortt, 2003; Patterson, 2002; Tolan & Loeber, 1993). BPT interventions address maladaptive parenting by training parents to use effective behavioral management strategies. Parents are first trained to define and monitor their youth's behavior. They then learn to avoid coercive interchanges by positively reinforcing youths' prosocial behavior and by implementing developmentally appropriate consequences for youths' defiance. BPT is typically conducted in the context of group or individual therapy and includes a mixture of didactic instruction, live or videotaped modeling, and role-plays. Two commonly used BPT interventions receiving substantial empirical support are the programs developed by Patterson and colleagues (Bank, Marlowe, Reid, Patterson, & Weinrott, 1991; Patterson & Forgatch, 1987) and by Webster-Stratton (1984).

Studies have also identified a variety of impaired social-cognitive skills among youth with antisocial behavior problems (Crick & Dodge, 1994; de Castro, Veerman, Koops, Bosch, & Monshouwer, 2002; Lochman & Dodge, 1994; Perry, Perry, & Rasmussen, 1986). These youth tend to hold hostile attributional biases, they make errors in the interpretation of social cues, and they have stronger expectations that aggression will lead to positive outcomes. CBT interventions target these social-problem-solving skill deficiencies by training youth to attend more effectively to social cues, to generate multiple interpretations for others' behavior, and to engage in non-violent problem-solving strategies. Youth also learn about the short- and long-term consequences of antisocial behavior and learn how to manage their negative affect. CBT for antisocial youth is most often conducted in a group setting. Numerous studies have demonstrated the effectiveness of CBT for reducing youths' antisocial behavior (Hinshaw & Anderson, 1996). In addition, the CBT programs such as Anger Coping Therapy (Lochman, Burch, Curry, & Lampron, 1984), Assertiveness Training (Huey & Rank, 1984), and Problem-Solving Skills

Training (Kazdin, Esveltd-Dawson, French, & Unis, 1987) have been defined as "probably efficacious" in the empirically supported treatment literature (Brestan & Eyberg, 1998).

Despite research noting favorable outcomes for BPT and CBT, studies have also identified a number of barriers associated with these two interventions. For example, although CBT is most commonly presented in a group setting, studies have shown that grouping deviant youth can lead to worse psychosocial outcomes (Dishion & Andrews, 1995). More favorable outcomes occur when groups include a mixture of antisocial and prosocial youth (Feldman, Caplinger, & Wordarski, 1983). In addition, parental psychopathology, family dysfunction (e.g., single-parent status, marital conflict), socioeconomic disadvantage, and low levels of self-reported quality of life predict higher attrition rates and decreased therapeutic change for parents participating in BPT (Kazdin & Wassell, 2000; Webster-Stratton & Hammond, 1990).

Previous Meta-Analyses

Two meta-analyses were recently conducted to examine the effectiveness of BPT and CBT for reducing youths' antisocial behavior. In the first meta-analysis, Serketich and Dumas (1996) computed mean post-treatment ESs from 26 controlled outcome studies using BPT to target the behavior problems of preschool and elementary school-aged youth. Collapsing across parent-, teacher-, and observer-report, Serketich and Dumas found a statistically significant outcome ES of 0.86. Serketich and Dumas also examined whether participation in BPT was associated with comparable changes in parents' psychological adjustment (e.g., marital satisfaction, depression, stress, irritability, and anxiety). Averaging across these domains of adjustment, they found a statistically significant ES of 0.44 (Serketich & Dumas, 1996).

Correlations between several methodological and contextual variables and the ESs from each study were used to identify moderators of treatment outcome. The results revealed a positive correlation with age, indicating that BPT was more effective for young elementary school-aged youth compared to preschoolers. In addition, there was a positive correlation with accuracy codes and a negative correlation with sample size, indicating that the ESs were higher when they were computed from less-accurate statistics (i.e., *F*- or *p*-values vs. means and standard deviations) and when the sample size was small. The authors did not find significant effects for any of the other contextual (family socioeconomic status, single-parent status, individual vs. group training, and traditional vs. enhanced

BPT) or methodological (treatment length, random assignment) variables (Serketich & Dumas, 1996).

Overall, the results of the meta-analysis by Serketich and Dumas (1996) support the effectiveness of BPT for reducing antisocial behavior among preschool and elementary school-age youth, and for improving parents' psychological adjustment. These findings need to be interpreted with caution, however, because the study had a few methodological limitations. For example, four of the studies included in this meta-analysis compared BPT to an alternative treatment, as opposed to a control condition. This makes it difficult to draw conclusions about the effectiveness of BPT relative to no intervention. Additionally, more than one effect size estimate was calculated from studies that used several treatment and control groups, which violates the independence assumption (discussed later).

In the second meta-analysis, Bennett and Gibbons (2000) examined the effectiveness of 30 studies using CBT to target antisocial behavior among elementary school-aged youth and adolescents. They found a post-treatment ES of 0.23 and a follow-up ES of 0.51, which were both significantly different from zero. Moderators of treatment outcome were examined by correlating each study's ES with several methodological and contextual variables. Results revealed a positive correlation with age, suggesting that CBT is more effective for adolescents compared to elementary school-aged youth. There was also a negative correlation with study quality, revealing higher ESs among studies conducted with less methodological rigor. Non-significant correlations were found for session length, sample size, sample type (clinical vs. non-clinical), type of control group (no-treatment, vs. attention placebo, vs. wait list), year of publication, and source of outcome (teacher-, parent-, observer-, peer-, and self-ratings).

The findings from the study by Bennett and Gibbons (2000) support the short- and long-term effectiveness of CBT for elementary school-aged youth and adolescents with antisocial behavior problems. Nevertheless, this study also had a few limitations. For example, the authors excluded studies using role-play performance as the dependent measure. With the primary goal of CBT being to train youth in the use of effective problem-solving skills, it would seem important to directly assess the acquisition of these skills during structured role-play situations. Another limitation is that the authors assigned an ES of .00 when the necessary data were not available to compute an estimate of effect and when the results from a study were reported as non-significant. This is an overly conservative approach because when studies rely solely on inferential statistics, sizable ESs are frequently missed because

studies often lack sufficient power to find a significant effect (Schmidt, 1996).

A comparison of Serketich and Dumas (1996) with Bennett and Gibbons (2000) might lead one to infer that BPT is superior to CBT for treating youth with antisocial behavior problems. Such a conclusion may be unwarranted, however, because of the different procedures used in the two meta-analyses, and because the two studies focused on youth at different stages of development. Therefore, the primary aim of this study was to evaluate the differential effectiveness of BPT and CBT (relative to no treatment or placebo control) using a uniform set of meta-analytic procedures and including youth at a similar developmental level. Given the sizable difference in the ESs reported in Serketich and Dumas and in Bennett and Gibbons, it was hypothesized that BPT would continue to demonstrate a significantly higher ES compared to CBT, even after employing similar meta-analytic methodology.

Secondary analyses were also conducted to explore whether the effectiveness of BPT and CBT was moderated by youth age, gender, and ethnicity. Regarding youth age, we assumed that the tasks faced by youth at different developmental stages would influence how they would respond to the two interventions (Forehand & Wierson, 1993). We hypothesized that studies using BPT interventions with preschool-aged samples would obtain a higher ES compared to studies using this intervention with elementary school-aged youth. This hypothesis was based on developmental theory, which suggests that as youth enter elementary school, they begin spending more time outside of the home and their parents become less of a reinforcing agent (Holmbeck, Greenley, & Franks, 2003). In addition, because CBT interventions teach youth to use cognitive skills to mediate their behavior, and developmental theory suggests that these skills may not develop until middle-childhood or adolescence (Durlak, Fuhrman, & Lampman, 1991; Kendall & Braswell, 1982; Peterson & Hamburg, 1986), we hypothesized that studies using CBT with adolescent samples would obtain a higher mean ES compared to studies using CBT with younger elementary-school-aged youth. Because research has yet to examine gender and ethnicity as moderators of BPT and CBT (Brestan & Eyberg, 1998), these analyses were treated as exploratory and no hypotheses were made in advance.

METHOD

Literature Search

Several approaches were used to identify the relevant literature. First, studies published prior to 2005 were

located through computerized searches of PsychINFO and Psychological Abstracts using the keywords "antisocial behavior," "behavior problems," "externalizing behavior," "parent training," "cognitive therapy," "behavior therapy," "anger-management training," and "social skills training" cross referenced with "child," "children," and "adolescents." Additionally, the lists of studies included in the meta-analyses conducted by Serketich and Dumas (1996), and Bennett and Gibbons (2000) were reviewed to identify articles fitting the inclusion criteria. After collecting all relevant published studies, their reference lists were reviewed for additional studies that might have been missed in the previous searches.

It should be noted that unpublished outcome studies (e.g., dissertations) were excluded from this meta-analysis. There is some disagreement in the field regarding the importance of including this literature in meta-analytic research. Some strongly advocate for the inclusion of unpublished studies as a way to generate a more accurate (less biased) picture of the true population effect (Dush, Hirt, & Schroeder, 1989; McLeod & Weisz, 2004), whereas others have found that the substantially greater time and energy required to recover these studies exerts negligible effects on meta-analytic results (Dush, Hirt, & Schroeder, 1983; Eppley, Abrams, & Shear, 1989). Given this debate, we ultimately decided to exclude the unpublished literature from the present study, recognizing that this decision places limits on the generalizability of our findings (discussed later).

Inclusion Criteria

In order to be included in this meta-analysis, a study had to meet the following criteria: (a) The target of treatment had to include at least one form of antisocial behavior (e.g., physical or verbal aggression, delinquency). Studies were excluded if they focused primarily on hyperactivity or developmental disability. Studies were also excluded if they focused exclusively on substance abuse. (b) The target youth had to be 18 years old or younger. (c) The treatment had to include either BPT or CBT. An intervention was considered BPT if it involved training parents or caregivers in the use of behavior management principles such as differential reinforcement. An intervention was considered CBT if it involved anger management, conflict resolution, social skills training, or cognitive restructuring. (d) The study had to include the comparison of a treatment group with an untreated or placebo control group. Studies were excluded if they compared BPT or CBT with another treatment or with a non-deviant control. (e) The study had to include at least one behavioral

outcome measure of antisocial behavior. (f) Studies had to provide adequate data for calculation of the ESs. Studies were excluded if they did not provide sufficient data or if the results were reported as non-significant.

Fixed-Effects Model

This meta-analysis used a fixed-effects approach by assuming that the source of variation across the studies came from sampling error. This decision was made because only published literature was included, and it was acknowledged that a substantial amount of the unpublished literature was being excluded from this study. The implication of the fixed-effects approach is that any inferences are conditionally based (i.e., they are based on the studies at hand). Generalizations are limited to the included studies and do not extend to the population of all possible studies in this line of research.

Computational Procedures

The ES for each study was computed using the Comprehensive Meta-Analysis (CMA) computer program (Borenstein, 1999), which computes an unbiased Cohen's d . When the means and standard deviations were available, the following formula was used to calculate d :

$$\text{Cohen's } d = \left[\frac{\bar{Y}_e - \bar{Y}_c}{SD_p} \right]$$

where Y_e is the mean of the experimental group, Y_c the mean of the control group, and SD_p the pooled standard deviation. A majority of the studies included in this meta-analysis provided the means and standard deviations needed to compute the ESs. When studies did not provide this information, t -values, F -values, and p -values were used to calculate d . Effect sizes in the positive range indicate that those receiving BPT or CBT scored lower on the behavioral measure than those in the control condition.

Hedges and Olkin (1985) recommend calculating an unbiased ES to adjust for the discrepancy between the sample ES and the population ES. This discrepancy exists because the sample standard deviation is only an estimate of the actual population standard deviation and is therefore subject to sampling error. The following formula was used in this study to calculate an unbiased estimate of d :

$$\text{Unbiased estimate of } d \cong \text{Calculated value of } d \times \left(1 - \frac{3}{4N - 9} \right)$$

Non-independence

One important assumption in group-based designs is statistical independence (i.e., each value in a particular group should represent a statistically independent observation). Using more than one observation from the same source tends to underestimate error variance and can inflate significance tests (Tabachnick & Fidell, 2001). Several of the studies in this meta-analysis used more than one outcome measure to examine the effectiveness of a particular intervention (e.g., parent- and teacher report). Reporting multiple ESs from a study would have violated the independence assumption. This concern was addressed by computing an ES for each outcome measure and then averaging them to obtain one estimate for a given study. Because the outcome source was also an important variable in this study, separate ESs for each outcome were considered in separate analyses. Often, a study used more than one measure for a particular outcome source (e.g., using multiple parent-report measures). In these cases, ESs for each measure were averaged to obtain a single ES for that outcome.

Another concern with statistical non-independence occurs when studies compare more than one treatment group to a control group. For instance, a number of studies included both a standard treatment condition (e.g., BPT) and an enhanced treatment condition (e.g., BPT plus communication training). The primary purpose of this study was to determine the overall effectiveness of BPT and CBT. The differential effectiveness of different treatment components within each type of intervention was not of interest here. Therefore, when a study included more than one BPT or CBT treatment group, outcome ESs for each group were computed and then averaged to obtain a single estimate for a given study. When studies used a no-treatment and attention placebo control group, ESs were calculated using the placebo control group only.

Combining Effect Sizes

The overall effectiveness of treatment for reducing youths' antisocial behavior was examined by weighting the ESs from each study and then averaging them to obtain an aggregate estimate of effect. The ESs from studies with larger samples sizes were assigned a larger weight because it was assumed that these estimates were more precise than the estimates from the smaller studies (Hedges & Olkin, 1985).

Homogeneity of Effect Sizes

When pooling ESs, it is assumed that the d s come from the same population (i.e., they are homogenous). The homogeneity of the ESs in this meta-analysis was examined using the following formula recommended by Hedges and Olkin (1985):

$$Q = \sum_{i=1}^k \frac{d_i^2}{\sigma^2(d_i)} - \left(\sum_{i=1}^k \frac{d_i^2}{\sigma^2(d_i)} \right)^2 \div \sum_{i=1}^k \frac{1}{\sigma^2(d_i)}$$

The Q test statistic has a chi-square distribution with $k - 1$ degrees of freedom. When the ESs were heterogeneous, weighted least squares (WLS) regression was used to identify potential moderators following Lipsey and Wilson's (2001) statistical procedures.

Hedges and Pigott (2001) found that at least five studies are needed for each categorical analysis in order to have an estimated power of 0.80. Therefore, moderator analyses were only conducted if they resulted in categories of at least five studies each.

Potential Moderators

The following variables were coded to serve as potential moderators of treatment outcome: intervention type, intervention approach, youth age, gender, and ethnicity. In addition, data on the length of follow-up was coded for descriptive purposes only.

Intervention type was coded as either BPT or CBT. Intervention approach was coded to determine whether the intervention was presented in the context of group or individual therapy. For client age, the mean age of the sample was recorded. In some situations, when only grade-level information was reported for the sample, age was estimated from youths' grade in school. Most studies reported outcome data on samples of mixed gender and ethnicity. Therefore, a study was coded as using a male or female sample when at least 66% of the sample came from either gender group, and coded as using a White or African-American sample when at least 66% came from either ethnic group. Studies were coded as mixed when the majority of their samples did not come from a particular gender or ethnic group. It is important to note that a number of potential cut-points were considered when coding the samples for gender and ethnicity. We ultimately chose to use 66% as the criterion because White males tended to be overrepresented in the literature, and higher cut-points would have resulted in only a few studies being coded as using predominantly female and/or African-American samples. Follow-up length represented

the number of months separating the post-treatment and follow-up assessments.

A kappa (κ) coefficient (Cohen, 1960) was used to determine the inter-rater reliability of the moderator variables. The first author initially coded all studies. Then, 15% of the studies were randomly selected and independently coded by a graduate student trained in the meta-analytic research process. Level of agreement between the two raters was excellent, with a mean κ of .87 (range .62–1.0), suggesting that the moderator variables were coded reliably. Coding discrepancies were discussed and a consensus was reached in all cases.

Control Variables

Researchers have suggested that meta-analyses tend to reveal more accurate estimates of effect when methodological quality is controlled (Mansfield & Busse, 1977). In this meta-analysis, the quality of the studies was assessed using a modified version of the coding system developed by Durlak et al. (1991). With this system, a study was assigned 1 point for each of the following criteria met: (a) the sample size ≥ 30 per group; (b) there was random assignment to the experimental and control groups; (c) at least one normed or blinded behavioral outcome measure was used; (d) an attention placebo control group was used; (e) an intent-to-treat design was used; and (f) the study reported post-test data for all assessment measures used at pre-test. The criteria are summed to yield an overall composite score ranging from 0 to 6, and this composite was tested as a potential control variable in the analyses.

The primary aim of this study was to examine the differential effectiveness of BPT and CBT. We recognize that when comparing these two interventions, it is important that other differences aside from intervention type be considered as confounding variables. In this study, the following four variables, which have all been shown to correlate with outcome in psychotherapy (Bergin & Garfield, 1994), were chosen as potential confounds: intervention length, outcome source, degree of disturbance, and intervention setting.

Intervention length was coded as the number of 1-h sessions used in a particular intervention. Outcome source was coded to indicate whether a study assessed outcome using parent-report, teacher-report, or observational techniques. Degree of disturbance was coded to determine if a study included at-risk youth (i.e., those identified by teachers or parents as displaying elevated behavior problems) versus those with a diagnosed behavior disorder from the *DSM*. Studies were also coded to indicate whether the intervention was delivered in a clinical (e.g.,

university clinic, residential treatment center) versus non-clinical (e.g., school) setting. We explored whether BPT and CBT differed with regard to these four variables, and controlled for any differences when comparing the ESs for the two interventions.

A kappa (κ) coefficient was once again used to determine the inter-rater reliability of the control variables, using the 15% of studies coded by both the first author and the trained graduate student. There was perfect agreement on each of the variables, with the exception of study quality criterion *d*, which received a κ of .74. Disagreements were resolved through discussion.

RESULTS

Literature Search

The preliminary computer search resulted in 366 studies. The other search strategies identified an additional 60 studies, resulting in 426 potential studies for this meta-analysis. Seventy-six (18%) of the 426 studies met the authors' six inclusion criteria. Year of publication for these studies ranged from 1973 to 2004. Of the 76 studies, 73 reported post-treatment outcome data and 17 reported follow-up outcome data.

Preliminary Analyses

Research suggests that it may be problematic to pool the results from studies using multiple assessment measures because the measures may be assessing different constructs (Wilson & Lipsey, 2001; Wolf, 1986). Therefore, the first step was to determine whether ES was related to type of assessment. Table I lists the breakdown of weighted ESs for the three main types of assessment used in the 76 studies (i.e., parent-report, teacher-report, and observation). A one-way analysis of variance (ANOVA) revealed that the weighted ESs for the three assessment methods were not reliably different $F(2, 108) = 1.88, ns$. Therefore, the ESs for each type of assessment within studies were averaged to obtain a mean ES for each study.

Table I. Weighted Effect Sizes For Each Type Of Outcome Measure

Type of measure	N	ES	95% CI
Parent-report	37	0.38	.25-.51
Teacher-report	40	0.31	.19-.43
Observation	35	0.47	.30-.64

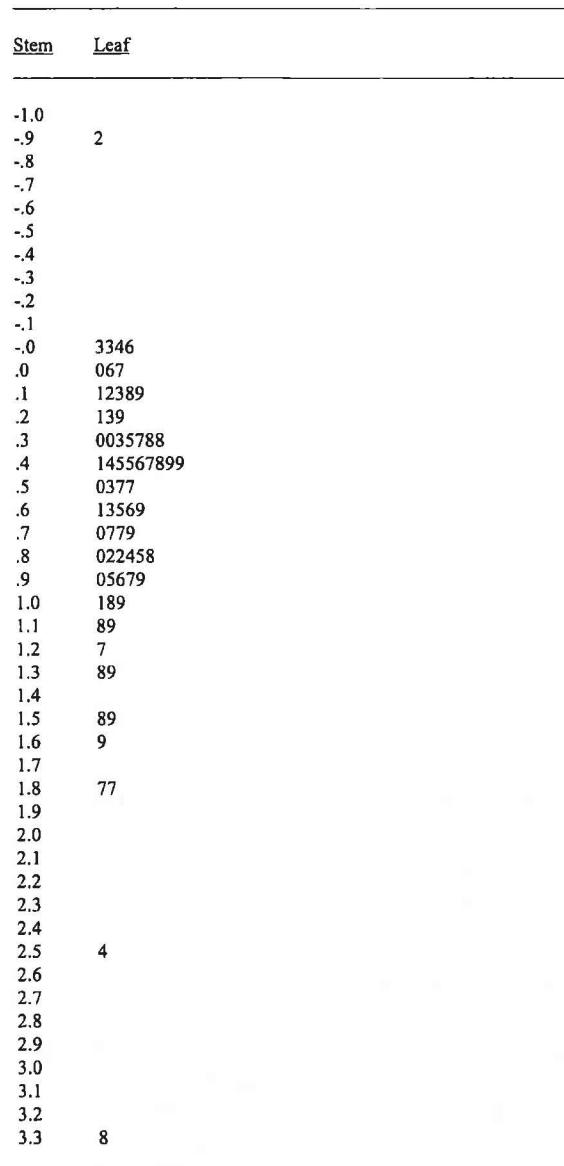


Fig. 1. Stem and leaf plot of weighted post-treatment effect sizes.

Stem-and-leaf plots of the post-treatment and follow-up ESs were used to identify the presence of outliers (see Figs. 1 and 2). As shown in Fig. 1, two studies had post-treatment ESs that deviated substantially from the other values. For example, Block (1978) had an ES of 2.54 and Snyder and White (1979) had an ES of 3.38. Because these values were more than 2 standard deviations from zero, a decision was made, based on the recommendations of Durlak, Meerson, and Ewell Foster (2003), to remove them from all further analyses, thus reducing the number of studies reporting post-treatment outcome data to 71.

Stem	Leaf
-1.0	
-.9	
-.8	
-.7	
-.6	
-.5	
-.4	
-.3	
-.2	
-.1	1
-.0	3
.0	1119
.1	11
.2	6
.3	14
.4	
.5	3
.6	5
.7	
.8	2
.9	
1.0	7
1.1	
1.2	9
1.3	
1.4	
1.5	

Fig. 2. Stem and leaf plot of weighted follow-up effect sizes.

As shown in Fig. 2, there were no outliers among the 17 follow-up studies.

Main Effect for Treatment

The 71 post-treatment studies contributed 30 ESs for BPT and 41 ESs for CBT. Tables II and III list the study-level ESs for these two types of interventions. The weighted mean ES for the 71 studies at post-treatment was 0.40, with a 95% confidence interval (CI) of .34–.47. Because the CI did not contain zero, the null hypothesis that $d = 0$ was rejected at the .05 level. The weighted mean ES at follow-up was 0.22 with a CI of .11–.34.

Study Quality

In terms of design features, the 71 studies reporting post-treatment data were moderately controlled, averaging 3.30 on our 0–6 study quality composite. We used WLS regression to determine whether study quality accounted for a significant amount of variability in the ESs. This model yielded a significant $R^2 = .06$ $Q(1, 69) = 7.19$, $p < .01$, with higher quality studies producing signifi-

cantly lower ES estimates ($\beta = -.24$, $p < .01$). Therefore, we decided to control for study quality in all further analyses.

Heterogeneity Tests and Moderator Analyses

When a test of heterogeneity was performed on the 71 ESs at post-treatment, results revealed significant variability $Q(70) = 130.17$, $p < .01$. Moderator analyses were performed to account for this variability. The first moderator tested was intervention type (BPT vs. CBT). Then, a series of analyses were conducted separately for BPT and CBT to explore potential moderators of each intervention. The information needed to code the moderator variables was not available in all studies. Descriptive statistics for the studies are presented in Tables IV and V.

Because the mean ages for the youth in the BPT (5.44) and CBT (11.28) studies were widely different, we decided to compare only those BPT ($n = 7$) and CBT ($n = 21$) studies including youth in the 6–12-year-old age range. This range represented common overlap in age for the two interventions. The mean ages for these subsamples were 8.50 for BPT and 9.68 for CBT. An independent samples t -test revealed that these mean ages were not significantly different $t(26) = 1.57$, ns .

Using this sub-sample of studies, we were interested in exploring whether intervention type accounted for a significant amount of the variability in the ESs, after controlling for study quality. To address this question, we conducted a hierarchical WLS regression in which study quality was entered first and intervention type second. The results, presented in the top half of Table VI, revealed a significant relationship between intervention type and ES after controlling for study quality. Inspection of the least squares means showed that BPT had a higher weighted mean ES ($d = 0.45$, $CI = .28-.60$) compared to CBT ($d = 0.23$, $CI = .11-.32$).

Next, we explored whether the differential effectiveness of BPT and CBT may be explained by differences between the two interventions on session length, outcome source, degree of disturbance, and intervention setting. An independent samples t -test revealed that the mean lengths of treatment for BPT (10.64 h) and CBT (16.10 h) were not reliably different $t(26) = 1.38$, ns . There were systematic differences in the outcome sources associated with the two interventions. For BPT, parent-report was the most commonly used outcome source ($n = 7$), followed by teacher-report ($n = 1$), and observational assessment ($n = 1$). For CBT, outcome was most frequently assessed using teacher-report ($n = 19$), followed by

Table II. BPT Study-Level Effect Sizes

Author(s)	n	Post-treatment		Follow-up	
		ES	95% CI	ES	95% CI
Bernal, Klinnert, and Schultz (1980)	24	1.38	0.42–2.34		
Bor, Sanders, and Markie-Dadds (2002)	48	0.38	– 0.21–0.97		
Bradley et al. (2003)	174	0.12	– 0.18–0.42		
Brestan, Eyberg, Boggs, and Algina (1997)	29	0.90	0.09–1.71		
Eyberg, Boggs, and Algina (1995)	16	1.68	0.40–2.96		
Firestone, Kelly, and Fike (1980)	18	1.39	0.19–2.59		
Funderburk et al. (1998)	35			0.09	– 0.65–0.83
Griest et al. (1982)	32	0.95	0.18–1.72		
Gross et al. (2003)	144	0.35	0.02–0.68	0.34	0.01–0.67
Hamilton and MacQuiddy (1984)	27	1.04	0.15–1.93		
Irvine, Biglan, Smolkowski, Metzler, and Ary (1999)	303	0.18	– 0.05–0.41	0.01	– 0.22–0.24
Leung, Sanders, Leung Mak, and Lau (2003)	69	0.66	0.17–1.16		
Martin (1977)	43	0.86	0.19–1.54		
Martinez and Forgatch (2001)	140			0.31	– 0.04–0.66
McNeil, Eyberg, Eisenstadt, Newcomb, and Funderburk (1991)	18	0.11	– 0.89–1.12		
Myers et al. (1992)	81	– 0.06	– 0.06–0.51		
Peed, Roberts, and Forehand (1977)	12	1.68	0.09–3.28		
Sayger, Horne, Walker, and Passmore (1988)	37	0.90	0.20–1.60		
Schuhmann, Foote, Eyberg, Boggs, and Algina (1998)	42	0.97	0.30–1.63		
Scott and Stradling (1987)	55	0.77	0.21–1.33		
Scott, Spender, Doolan, Jacobs, and Aspland (2001)	83	0.78	0.30–1.26		
Spaccarelli, Cotler, and Penman (1992)	53	0.80	0.18–1.42		
Walle, Hobbs, and Caldwell (1984)	25	1.31	0.27–2.36		
Walter and Gilmore (1973)	12	1.29	– 0.13–2.70		
Webster-Stratton (1982)	35	0.50	– 0.20–1.20		
Webster-Stratton (1984)	24	0.83	– 0.06–1.72		
Webster-Stratton (1990)	43	0.45	– 0.24–1.14		
Webster-Stratton (1992)	100	0.38	– 0.03–.79		
Webster-Stratton and Hammond (1997)	48	0.52	– 0.07–1.11		
Webster-Stratton, Kolpacoff, and Hollinsworth (1988)	54	0.51	– 0.04–1.06		
Webster-Stratton, Reid, and Hammond (2004)	57	0.49	– 0.05–1.03		
Zangwill (1983)	11	1.19	– 0.30–2.67		

observational assessment ($n = 10$), and parent-report measures ($n = 7$). Nevertheless, a one-way ANOVA revealed that the weighted mean ESs for these three sources of outcome, collapsed across treatment type, were not reliably different $F(2, 42) = .156, ns$. A phi-coefficient was used to explore the correlation between intervention type and degree of disturbance. The results of this test were not significant $r_\phi = .24, ns$. A phi-coefficient was also used to explore the correlation between intervention type and intervention setting. Results of this test were significant $r_\phi = .58, p < .01$. A cross-tabulation of these two variables indicated that while an equal number of BPT and CBT interventions took place in a clinical setting, only CBT interventions took place in non-clinical settings (e.g., schools).

Given the significant relationship between intervention type and intervention setting, we decided to re-run our hierarchical WLS regression including intervention

setting as a control variable. For this model, study quality was entered first, followed by intervention setting, and intervention type. The results are presented in the bottom half of Table VI. As can be seen, once the setting variable is entered into the model, the effect of intervention type is no longer significant. Unfortunately, we were unable to enter an intervention setting \times type interaction term in the model because the BPT and CBT studies were not represented across both levels of intervention setting (i.e., although the CBT interventions were conducted in both clinical and non-clinical settings, the BPT interventions were conducted exclusively in clinical settings). Nevertheless, we were able to explore the weighted means for these groups. The weighted mean ES for BPT in clinical settings ($n = 7$) was 0.44 (CI = .14–.75). The mean ES for CBT in clinical settings ($n = 7$) was 0.29 (CI = – .11–.69) and the ES for CBT in non-clinical settings ($n = 14$) was 0.21 (CI = .04–.38).

Table III. CBT Study-Level Effect Sizes

Author(s)	n	Post-treatment		Follow-up	
		ES	95% CI	ES	95% CI
Arbuthnot and Gordon (1986)	47	1.08	0.44-1.71		
Coats (1979)	16	0.60	-0.50-1.70		
Coleman, Pfeiffer, and Oakland (1992)	39	-0.03	-0.70-0.64		
Deffenbacher, Lynch, Oetting, and Kemper (1996)	120	0.41	0.03-0.79		
Dishion and Andrews (1995)	67	-0.04	-0.53-0.45	-0.11	-0.68-0.46
Etscheidt (1991)	30	1.87	0.91-2.82		
Feindler, Ecton, Kingsley, and Dubey (1986)	21	0.99	0.01-1.97		
Feindler, Marriott, and Iwata (1984)	36			0.84	0.13-1.55
Forman (1980)	18	1.66	0.32-2.99		
Glick and Goldstein (1987)	60	0.70	0.16-1.24		
Gottfredson, Jones, and Gore (2002)	111	0.23	-0.16-0.62		
Guerra and Slaby (1990)	120	0.65	0.26-1.05		
Hollin and Courtney (1983)	9	-1.04	-2.73-0.65	0.12	-1.47-1.71
Hudley and Graham (1993)	66	0.54	-0.01-1.08		
Huey and Rank (1984)	48	0.85	0.24-1.46		
Kazdin, Esveldt-Dawson, French, and Unis (1987)	33	1.21	0.44-1.98	1.32	0.54-2.10
Kettlewell and Kausch (1983)	41	0.19	-0.44-0.82		
Larson (1992)	37	0.07	-0.61-0.75	0.66	-0.03-1.36
Lee, Hallberg, and Hassard (1979)	16	0.35	-0.74-1.44		
Lochman (1992)	83			0.12	-0.34-0.57
Lochman (1985)	39	0.63	-0.04-1.30		
Lochman, Coie, Underwood, and Terry (1993)	18	1.00	-0.06-2.06	1.12	0.05-2.20
Lochman and Lampron (1988)	31			0.01	-0.78-0.80
Lochman, Lampron, Burch, and Curry (1985)	76	0.50	0.03-0.97		
Lochman, Lampron, Gemmer, Harris, and Wyckoff (1989)	32	0.37	-0.47-1.21		
Michelson et al. (1983)	42	-0.03	-0.69-0.63	0.01	-0.65-0.67
Miran, Lehrer, Koehler, and Miran (1974)	19	1.87	0.60-3.13		
Normand and Robert (1990)	42			0.27	-0.49-1.03
Olexa and Forman (1984)	64	0.13	-0.45-0.71	-0.03	-0.61-0.55
Ollendick and Hersen (1979)	27	0.84	-0.03-1.71		
Omizo, Hershberger, and Omizo (1988)	24	0.72	-0.15-1.60		
Prinz, Blechman, and Dumas (1994)	80	0.29	-0.16-0.74	0.54	0.07-1.01
Robinson, Smith, and Miller (2002)	41	0.48	-0.16-1.12	0.09	-0.54-0.73
Saylor, Benson, and Einhaus (1985)	10	0.52	-0.99-2.03		
Schlichter and Horan (1981)	19	0.06	-0.91-1.03		
Schneider and Byrne (1987)	35	0.46	-0.29-1.21		
Snyder, Kymissis, and Kessler (1999)	50	0.58	0.00-1.16		
Tanner and Holliman (1988)	24	0.85	-0.04-1.73		
Teglasi and Rothman (2001)	16	0.22	-0.85-1.30		
Webster-Stratton and Hammond (1997)	49	0.38	-0.20-0.97		
Webster-Stratton, Reid, and Hammond (2001)	97	0.30	-0.11-0.70		
Webster-Stratton, Reid, and Hammond (2004)	56	0.40	-0.14-0.95		
Weissberg, Gesten, Carnrike et al. (1981)	563	0.00	-0.17-0.17		
Weissberg, Gesten, Rapkin et al. (1981)	171	0.61	0.30-0.92		
Winer, Hilpert, Gesten, Cowen, and Schubert (1982)	102	0.30	-0.10-0.70		

BPT. The weighted post-treatment ES for BPT was 0.47 (CI = .34-.61). There was significant heterogeneity among the 30 BPT ESs, $Q(29) = 50.43$, $p < .01$, permitting the exploration of potential moderator variables. Before computing the moderator analyses, ESs for youth outcome based on parent-report, teacher-report, observa-

tional assessment, and the ESs for intervention follow-up and parental adjustment were computed. The estimate for parental adjustment was computed by averaging the ESs for parental stress, depression, and anxiety. These domains of distress are commonly assessed in parents following their participation in BPT. The results of these

Table IV. Descriptive Statistics for the BPT Studies Included in the Meta-Analysis

Variable	Frequency		M (SD)	Range
	n	(%)		
Predominant gender	29			
Male		16 (55)		
Female		0 (0)		
Mixed		13 (45)		
Predominant ethnicity	14			
White		8 (57)		
African-American		1 (7)		
Other		1 (7)		
Mixed		4 (29)		
Intervention approach	30			
Group		16 (53)		
Individual		14 (47)		
Intervention setting	30			
Clinical		29 (97)		
Non-clinical		1 (3)		
Degree of disturbance	30			
DSM-diagnosed		6 (20)		
At risk		24 (80)		
Client age	29		5.44 (2.08)	3–12
Session length (hours)	29		17.16 (13.00)	2–48
Follow-up length (months)	2		7.50 (6.36)	3–12

Note. n represents the number of studies that provided enough information to code a particular variable.

Table V. Descriptive Statistics for the CBT Studies Included in the Meta-Analysis

Variable	Frequency		M (SD)	Range
	n	(%)		
Predominant gender	40			
Male		24 (60)		
Female		0 (0)		
Mixed		16 (40)		
Predominant ethnicity	34			
White		12 (35)		
African-American		9 (26)		
Other		0 (0)		
Mixed		13 (38)		
Intervention approach	41			
Group		38 (93)		
Individual		3 (7)		
Intervention setting	41			
Clinical		17 (42)		
Non-clinical		24 (58)		
Degree of disturbance	41			
DSM-diagnosed		9 (22)		
At risk		32 (78)		
Client age	38		11.28 (3.40)	5–18
Session length (hours)	40		16.32 (11.78)	3–50
Follow-up length (months)	15		8.00 (9.72)	1–36

Note. n represents the number of studies that provided enough information to code a particular variable.

Table VI. Hierarchical WLS Regression Analysis Predicting Effect Sizes

	F	ΔR^2	β	z
Model 1	4.20			
Study quality			-.06	-.45
Treatment type			-.28	-2.02*
Model 2	4.71	.01		
Study quality			-.09	-.63
Treatment setting			-.15	-.71
Treatment type			-.17	-.89

*p < .05.

computations are presented in Table VII. An ES for follow-up was not computed because only four BPT studies collected follow-up data.

Sufficient information was available to conduct moderation analyses using youth age and intervention approach. Hierarchical WLS regression was used to examine the relationship between these variables and ES after controlling for study quality. Neither age ($\beta = -.23, ns$) nor intervention approach ($\beta = .23, ns$) showed a significant relationship with ES in this model.

Inconsistent reporting of demographic variables in many of the studies prevented the testing of gender and ethnicity as potential moderator variables. For example, only 14 studies reported information on youth ethnicity. Although 29 BPT studies included information on youth gender, none used a predominantly female sample.

CBT. The weighted post-treatment ES for CBT was 0.35 (CI = .25–.47). There was also significant heterogeneity among the 41 CBT ESs, $Q(40) = 76.58, p < .01$, permitting the exploration of potential moderator variables. First, analyses were conducted to examine the ES for youth outcome based on parent-report, teacher-report, observational assessment, and the ES for intervention follow-up (see Table VII).

Information was available to conduct moderation analyses for youth age and ethnicity. Hierarchical WLS

Table VII. Weighted Effect Sizes for the Different Sources of Outcome

Intervention	Outcome variable	n	ES	95% CI
BPT	Post-treatment	30	0.47	.34–.61
	Parent-report	27	0.38	.24–.51
	Teacher/staff-report	7	0.38	.12–.65
	Observational	13	0.45	.22–.67
CBT	Parent adjustment	15	0.33	.16–.51
	Post-treatment	41	0.35	.25–.47
	Parent-report	6	0.37	.05–.68
	Teacher/staff-report	25	0.29	.15–.43
	Observational	15	0.51	.25–.76
	Follow-up	13	0.31	.13–.48

regression was used to examine the relationship between these variables and ES after controlling for study quality. There was a significant relationship between ES and youth age ($\beta = .37$, $p < .01$), although the relationship between ES and youth ethnicity was non-significant ($\beta = -.10$, ns). The predominantly White samples obtained a weighted mean ES ($d = 0.47$, $CI = .28-.66$) that was only slightly higher than the predominantly African-American sample ES ($d = 0.41$, $CI = .15-.67$).

A parental adjustment ES was not computed because this domain was not assessed in any of the studies using CBT (see Table VII). Furthermore, none of the studies included a predominantly female sample and only three studies used individually administered CBT, preventing us from examining gender and intervention approach as moderators of CBT.

DISCUSSION

The effects of BPT and CBT for aggressive behavior problems in youth were investigated using a sample of 71 published outcome studies. The overall mean ES for this total sample of studies was 0.40.

The mean ES of BPT (0.47) and the mean ES of CBT (0.35) were both in the small to medium range (Cohen, 1988), suggesting that these interventions can be effective for treating aggressive behavior problems among youth. For the BPT studies, there was also a small ES for parent adjustment (0.33), suggesting that parents participating in BPT experience reductions in their own psychosocial distress. Similar findings have been reported elsewhere (Kazdin & Wassell, 2000). The mean ES of CBT at follow-up (0.31) was in the small range, suggesting that the beneficial effects of CBT tend to be maintained over time. Sufficient information was not available to compute a follow-up ES for BPT.

The main objective of this study was to extend the findings from previous meta-analytic work by using a uniform set of meta-analytic procedures to examine the differential effectiveness of BPT and CBT. When comparisons were made between the BPT and CBT studies involving youth in a similar age range (6–12 years), the ES for BPT (0.45) was significantly higher than the ES for CBT (0.23). This finding provides some support for our hypotheses and can be considered in the context of developmental theory, which contends that the developmental tasks faced by youth at different ages may influence how they respond to various interventions (Forehand & Wierson, 1993). The superiority of BPT over CBT may be explained by the developmental level at which the comparison between the two interventions were made. For

youth in the 6–12-year-old age range, BPT interventions may be more effective because youth at this developmental level are more dependent on their parents and look to them for guidance and support (Rogoff, 1990). CBT interventions, on the other hand, may be less effective for youth in this age range because they have only begun to develop the more abstract cognitive skills that are often emphasized in these interventions (e.g., self-reflection, consequential thinking, consideration of future possibilities, etc.) (Durlak et al., 1991; Kendall & Braswell, 1982).

A secondary aim of this study was to explore whether the effectiveness of BPT and CBT was moderated by different demographic variables. Youth age did not moderate the effectiveness of BPT.

For CBT, however, there was a positive relationship between age and ES. This is consistent with the findings by Durlak et al. (1991) that as youth enter more advanced levels of cognitive development, they receive increased benefits from this intervention.

The examination of youth gender and ethnicity as potential moderators of BPT and CBT was more problematic. There was inconsistent reporting of this demographic information in several of the studies. Furthermore, the studies that did include this information failed to report outcome data separately for the different gender and ethnic groups. A decision was made to code studies as male or female and as African-American or White when at least 66% the sample came from a particular gender or ethnic group. Even after employing this methodology, however, we were still unable to examine gender as a moderator because none of the BPT or CBT studies included a predominantly female sample. We were able to examine ethnicity as a moderator of CBT, and found that African-American and White youth responded similarly to this intervention approach. This finding needs to be considered tentative, however, because the 66% criterion that was used in coding the studies is very low and the two ethnic groups were still mixed to some extent.

Our difficulties with exploring demographic moderators of BPT and CBT highlight some serious weaknesses in the literature. The samples of youth participating in BPT and CBT outcome studies appear to be predominantly White and male. This is extremely concerning because White males do not represent the entire population of youth experiencing antisocial behavior problems. In fact, several studies have also identified high rates of antisocial behavior among minority males and females living in urban settings (DuRant, Cadenhead, Pendergrast, Slavens, & Linder, 1994; Hammond & Yung, 1993). The current state of the literature raises some serious questions about the applicability of BPT and CBT with diverse clients.

As the field moves toward improving the contextual specificity of BPT and CBT (Brestan & Eyberg, 1998), more research is sorely needed to explore whether our interventions are empirically supportable with youth from different gender and sociocultural backgrounds.

We encountered some interesting findings when comparing BPT and CBT, which adds to the complexity of considering the contextual specificity of these two interventions. When we controlled for intervention setting in our analyses, the differential effect of BPT and CBT disappeared. We were unable to explore the interaction between intervention setting and type because BPT and CBT studies were not represented across both levels of setting. However, a qualitative inspection of the ESs yielded by the two intervention types appears to have an interpretable trend. For example, BPT conducted in a clinical setting received the highest mean ES (0.44), followed by CBT in clinical (0.29) and non-clinical (0.21) settings. It appears there may be systematic differences here, suggesting that we need to carefully consider the effect of setting in future work.

Another layer of complexity is that the effectiveness of BPT and CBT may depend on the developmental trajectory of antisocial behavior (Frick, 2001). Youth identified as CD at a younger age are likely to be more homogenous and on a different developmental trajectory than most of the youth identified at later ages. These clinical characteristics likely interact with developmental variability in cognitive abilities in influencing the differential outcome of interventions. While BPT may be more effective for younger youth because their underdeveloped cognitive skills make them less competent at CBT interventions, it may also be that BPT is more effective than CBT for early-onset CD because these youth have high levels of impulsivity and emotional reactivity, low verbal IQ, and/or callous and unemotional traits, making them poor candidates for CBT interventions. Furthermore, although the adolescent samples in this study responded better to CBT, these samples may represent a heterogeneous group who may be responding differentially based on whether they have Childhood- or Adolescent-Onset CD, which waters down the aggregated results. Although these distinctions were not considered in this meta-analysis, this would likely be an important area for future research.

Limitations

One limitation in this meta-analysis is the stringent inclusion criteria, especially the criterion that each study had to compare BPT or CBT to a no-treatment or placebo control. This criterion was used to achieve a homoge-

neous, untreated, baseline. At the same time, this criterion led to some unavoidable limitations, namely the exclusion of important studies in the field that compared BPT or CBT to an alternative treatment and the relatively small number of studies available for some of our comparisons. Another limitation is related to our use of a composite measure of study quality. Potential problems with this index are that it assumes that methodological quality is unidimensional and it combines different methodological issues of different importance, and potentially different directions of influence, into an overall composite. Our analysis would have been strengthened had we been able to consider the influence of each component of study quality separately in the regression. Unfortunately, our relatively small sample size did not provide us with enough degrees of freedom to take such an approach. An additional limitation of this study is the use of age as a proxy for youths' developmental level, as opposed to any specific assessment measures present in the included studies. Although age is commonly used in meta-analytic research to estimate the stage of youths' cognitive development (Holmbeck et al., 2003), we recognize that there is likely some degree of error associated with this practice. We also recognize that the higher ES found for BPT compared to CBT may be related to systematic differences in the outcome source associated with the two interventions. The information presented in Table VII shows that for BPT, parent-report measures were most commonly used to assess outcome, whereas for CBT, outcome was assessed primarily through the use of teacher-report measures. Parents participating in BPT may be more sensitive to changes in their youths' behavior because they are directly involved in the intervention and because they receive considerable training on how to monitor their youths' behavior. Teachers, on the other hand, are not typically involved with CBT interventions, and they may be less aware of a youth's behavior change when that youth is one of many students in a classroom. Finally, we recognize that there are likely to be differences in the types of antisocial behavior problems exhibited by youth at different stages of development. For example, school-aged youth tend to engage in more oppositional behaviors, while adolescents engage in more aggressive and covert (e.g., truancy) antisocial behaviors (McMahon & Wells, 1998). This meta-analysis did not differentiate among these different types of behavioral outcomes when comparing the effectiveness of BPT and CBT, making it difficult to determine which specific behaviors were being modified by the two treatments. This issue needs to be considered in future meta-analyses, however, as the relative effectiveness of these treatments across age and specific problem behaviors is important to the field.

Research Implications

The results of this study highlight a number of implications for future research. The identification of factors that influence youths' response to therapy is an important endeavor (Kazdin & Weisz, 1998). However, there are numerous factors that must be considered when exploring relevant differences among treatment types, making the study of moderating variables of psychotherapy somewhat difficult. One factor deserving further attention is treatment setting. The data presented in this meta-analysis suggest that it may be helpful to restrict samples to a specific setting when comparing the differential effects of different interventions. Although not specifically tested in this meta-analysis, the effect of treatment length on outcome may also represent an important avenue of future research. In addition, the 6–12-year-old age range in which comparisons between BPT and CBT were made is relatively broad from a developmental perspective. The relatively small number of studies available in this meta-analysis prevented us from using a more narrow age range in our comparisons, and this should be considered as a potential next phase of meta-analytic research. Research should also move toward differentiating among the subtypes of CD when evaluating the effectiveness of BPT and CBT.

It was difficult to test gender and ethnicity as moderators of BPT and CBT because there was inconsistent reporting of these demographic variables in many of the studies. A review of the BPT and CBT studies that did report this descriptive information revealed that African-American and female youth tend to be underrepresented in the literature. As the field moves toward improving the contextual specificity of our interventions, more research is needed to determine whether the interventions most commonly used with White males are also effective with more diverse populations.

It is also important to note that there are a number of convincing studies suggesting that broad-based interventions that include involvement with parents, youth, and other systems (e.g., schools) are more effective than either BPT or CBT alone. Examples of such interventions include Multisystemic Therapy (MST; Henggeler & Borduin, 1990) and the multi-modal treatment package developed Webster-Stratton and colleagues (Webster-Stratton & Hammond, 1997; Webster-Stratton et al., 2004). Consideration of these multi-modal interventions was beyond the scope of this review and future meta-analytic work should evaluate the differential effectiveness of these combined approaches and their individual components.

ACKNOWLEDGMENTS

The authors would like to express their appreciation to Michael T. Hynan for his helpful comments and suggestions on an earlier draft of this article.

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