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EFFECTIVENESS OF SOCIAL COMPETENCE PROMOTION ON DISRUPTIVE BEHAVIOR:A QUANTITATIVE REVIEW

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EFFECTIVENESS OF SOCIAL COMPETENCE PROMOTION
ON DISRUPTIVE BEHAVIOR:
A QUANTITATIVE REVIEW
BY DIANE L. WHIPPLE

A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY
IN
PSYCHOLOGY

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Abstract

A meta-analysis was conducted that examined the effects of both incorporating parents as treatment agents and involving a varying number of treatment agents in social-skills programs with 2,693 children displaying disruptive behavior. Children participated in social-skills training that included different combinations of treatment agents including clinicians, teachers, parents, and peers. Results indicated that programs incorporating a parent component and those not including parents as treatment agents both increased participants' social competence post-treatment. No evidence was found, however, that incorporating a parent component in programs increased treatment benefits. Social-skills training incorporating various combinations of one, two, three, and four treatment agents were all effective in improving participants' social competence, but there was no evidence that increasing the number of treatment agents had any effect on treatment outcome. Various follow-up analyses were conducted. No relationship was found between duration for which children participated in the social-skills program and treatment efficacy. Additionally, results showed that participant characteristics such as age, gender and ethnicity were not predictive of post-treatment social competence levels. Also, analogue, observation, and sociometric outcome measures revealed increases in participants' social competence after social-skills training whereas rating scales did not show increases in individuals' social competence after treatment. Overall, participants, teachers, clinicians, and peers all indicated increases in social competence post-treatment. In contrast, parents did not perceive reliable increases in their children's social competence after social-skills training. Strengths and limitations of the current study and directions for future research are addressed.

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In addition, I thank my committee member Dr. Karen McCurdy for her professional interest in my research. She played an important role in shaping this research into a far more interesting project than initially presented to her. Her ability to understand the heart of this study and to guide the development of the initial hypothesis was impressive.

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Introduction

This section describes literature relevant to the research purposes of this dissertation. It is organized into 11 sections: (1) importance of addressing antisocial behavior, (2) diagnostic information, (3) chronic nature of disruptive behavior, (4) social skill deficits, (5) social-skill training, (6) efficacy of child-focused social-skills training, (7) parent training, (8) factors influencing treatment outcome, (9) meta-analyses of social-skills training, (10) assessing treatment outcome, and (11) conclusion. Within each section, the relevance of the literature to the research reported in this dissertation is discussed.

Importance of Addressing Antisocial Behavior

Due to estimates of chronic behavior problems in school-age children ranging from 1% to 5% (Sugai, Horner et al., 2000; Sugai, Sprague, Horner, & Walker, 2000; Taylor-Greene et al., 1997) and estimates of diagnosed behavior disorders in children and adolescents ranging from 7% to 35% (Hawkins, Catalano, Kosterman, Abbott, & Hill, 1999), addressing antisocial behavior in children and youth has become an issue of importance (Losel & Beelmann, 2003). Indeed, public opinion suggests that student behavior issues such as poor discipline, violence, and drug use, are more serious problems than curriculum content, teacher quality, or inadequate facilities (National Center for Education Statistics, 2002). Serious problems involving aggressive and violent behavior trigger stress, suffering, and costs for victims, parents, the community, and the youngsters themselves (Losel & Beelmann, 2003).

Diagnostic Information

Various diagnostic labels have been used to describe persistent engagement in

disruptive behavior. Psychiatrists and psychologists employ labels for two disorders in which conduct problems are the primary focus, Oppositional Defiant Disorder and Conduct Disorder (American Psychological Association, Diagnostic and Statistical Manual of Mental Disorders, 4th ed., revised, 2000). Oppositional Defiant Disorder may be defined as a pattern of at least four of the following behaviors: (a) losing temper, (b) arguing with adults, (c) actively defying or refusing to comply with requests or rules of adults, (d) deliberately doing things that will annoy other people, (e) blaming others for one's own mistakes or misbehavior, (f) being touchy or easily annoyed by others, and (g) being spiteful or vindictive. The essential features of Conduct Disorder are a pattern of behavior characterized by aggressive conduct that causes or threatens physical harm to people or animals, non-aggressive conduct that causes property damage or loss, deceitfulness or theft, and serious rule violations.

Grant-related legislation through the 10th Amendment of the U.S. Constitution provides guidelines for defining emotional disturbance within the school setting. The Individuals with Disabilities Act (1999) criteria for serious emotional disturbance include one or more of the following characteristics that persist over time to a marked degree and that negatively impact the child's educational performance: (a) inability to learn due to the emotional disturbance, (b) inability to build or maintain satisfactory interpersonal relationships (i.e., peers, teachers) due to the emotional disturbance, (c) odd or bizarre behavior under normal circumstances, (d) overt signs of unhappiness or depression, and (e) development of physical symptoms or fears associated with personal or school problems.

Due to concern that the use of diagnostic labels may stigmatize and/or over-

pathologize children whose behavior may be more reflective of parental intolerance or inappropriate parenting techniques than of some inherent dysfunction in the child, researchers (Campbell, 1990; Loney & Milich, 1982) were prompted to use a broader classification system of child behavior problems. Empirically-based factor analytic research indicated two broad-band groupings or clusters of child behavior problems, “internalizing” and “externalizing” behavior problems (Achenbach & Edelbrock, 1978). Internalizing behaviors include over-controlled, withdrawn, and fearful behaviors, whereas externalizing behaviors are characterized by a pattern of under-control, including outwardly-expressed behaviors subsumed within Oppositional Defiant Disorder and Conduct Disorder diagnostic categories.

Other terms have been used to describe youngsters’ behavior problems (Wicks-Nelson & Israel, 2003). These terms include acting out, disruptive, under-controlled, and delinquent. A minor who commits an illegal act may be classified as a juvenile delinquent or a status offender. Emotional and behavioral disorders have been widely researched and results show that disruptive behaviors are stable within individuals over time, becoming fairly well entrenched in youths’ repertoire by adolescence (Lipsey & Derzon, 1998).

Chronic Nature of Disruptive Behavior

Disruptive behaviors in general tend to persist over time (Fergusson, Lynsky, & Horwood, 1997; Loeber, Burke, Lahey, Winters, & Zera, 2000), especially if they arise at a young age and exceed moderate levels of intensity (Babinski, Hartsough, & Lambert, 1999; Fergusson & Woodward, 2000; Loeber & Farrington, 2000). Elementary school children who are unable to master social demands placed on them in the classroom such

as sitting quietly and not disrupting others, but who instead display disruptive or aggressive behaviors, are prone to later social problems including behavioral disorders and delinquency (Kellam, Ling, Merisca, Brown, & Ialongo, 1998; United States [US] Department of Justice, 2000). Children and youth commit the full spectrum of crimes, from theft and assault to murder (US Department of Justice, 2000).

Most chronic offenders begin their delinquency careers prior to the age of 12 years (US Department of Justice, 2000). In 1999, US law enforcement agencies arrested about one-quarter of a million youths under the age of 12 years. Research (US Department of Justice, 2000) uniformly shows that these individuals are two to three times more likely to engage in subsequent violence, serious offenses, and chronic offending compared to later-onset offenders. Important early warning signs of later problems include disruptive behavior that is more frequent and intense than same-age children, temper tantrums and violence that persist past the age of three years, physical fighting, cruelty to animals, lying, theft, setting fires, an inability to get along with others, low motivation during elementary school, substance use, and repeated victimization such as bullying. About 50% of elementary school-age children who display high levels of disruptive behaviors, such as disobedience and fighting, generally continue these behaviors into adolescence (Eddy, 2001).

Moffit, Caspi, Harrington, and Milne (2002) affirm that youths with aggressive and destructive behaviors have a particularly poor prognosis, even after treatment. Indeed, 40% to 75% of adolescents who exhibit high levels of disruptive behaviors, such as stealing and assault, continue this pattern of behavior during adulthood resulting in difficulties in marital and family relationships, workplace performance, and mental and

physical functioning (Eddy, 2001; US Department of Justice, 2000). Research on emotional and behavioral disorders indicates that children and youth displaying disruptive behavior tend to exhibit and experience associated difficulties including poor social skills (Gresham, 2002) and problem-solving skill deficits and/or distortions (Kendall, 1991).

Social Skill Deficits

Children and youth displaying disruptive behavior typically have a wide range of significant social-skill deficits (Lochman, Whidby, & Fitzgerald, 2000; Walker, Colvin, & Ramsey, 1995). Social skills are commonly conceptualized as situation- and setting-specific behaviors—not traits—that are predictive of important social outcomes for children (Sheridan & Walker, 1999). In contrast, social competence is an evaluative term based on judgments that a person has performed competently on a social task within and across situations over time (McFall, 1982). Thus, social skills can be viewed as one component necessary for developing social competence—the ability to set and to achieve objectives in social situations (Parkhurst & Asher, 1985).

An important aspect of social-skill assessment is classifying the specific kind of social-skills deficits a youngster may have (Gresham, 1981; Gresham & Elliot, 1990). To assess why a child is not performing socially acceptable social skills, a functional analysis may be performed to understand the function of particular problematic behaviors (Reschly, Tilly, & Grimes, 1999). Through observations, interviews, and manipulation of environmental variables, the clinician can test various hypotheses about particular antecedents and consequences that might encourage or reinforce the socially undesirable behavior.

Social-skill deficits may result from social-skills acquisition, performance, or fluency deficits (Gresham, 1981) and from competing problem behaviors (Gresham & Elliot, 1990). Social-skill acquisition deficits refer to the lack of knowledge to execute a particular social skill (Gresham, 1981). Social-skill performance deficits assume the presence of the social skill within the individual's repertoire, but the failure to perform the skill at an acceptable level in social situations. Social-skill fluency deficits stem from an individual's lack of exposure to adequate competent models, from lack of practice, or from inadequate behavioral rehearsal of newly taught or infrequently used social skills.

Competing behavior such as impulsivity or defiance may block skill acquisition (Gresham & Elliot, 1990). In the case of performance deficits, competing behavior such as aggression may be performed instead of pro-social behavior because it is a more efficient or reliable form of producing reinforcement (Horner & Billingsley, 1988). Efficient behaviors are behaviors that are easier to perform in terms of response effort and those that produce desired outcomes. Reliable behaviors are behaviors that produce the desired outcomes more consistently than the socially skilled alternative behaviors. For example, if a child grabs a toy from another child, he/she may get the desired toy faster and more consistently than if he/she asked another child for the toy and had to rely on the other child choosing to share.

Outcomes associated with social-skill deficits include ineffective socializing skills with peers or significant adults in the social environment, difficulties in communicating physical and emotional needs properly, inadequate knowledge of social rules and manners, inability to appraise social situations correctly, and externalizing behavior such as violence and aggression (Walker et al., 1995). Youngsters with ineffective socializing

skills experience significant difficulties in the development and maintenance of satisfactory interpersonal relationships, exhibition of pro-social behavior patterns, and social acceptance by family members, teachers, and peers (Gresham, 1998; Kauffman, 2001; Walker, Ramsey, & Gresham, 2004). Unfortunately, eliminating disruptive behavior patterns is quite difficult as these children increasingly alienate themselves from many important socializing influences and supports (Lochman et al., 2000), prompting the need for intervention to develop and to refine appropriate social behavior (Bloomquist & Schnell, 2002).

Social-Skill Training

Given the long-standing nature of social-skills deficits in childhood disorders characterized by aggressive behavior patterns, teaching social skills to children and youth who display disruptive behavior has become a primary intervention to improve social competence (Gresham, 2002; Rutherford, Quinn, & Mathur, 1996). A variety of child-focused social-skills training strategies have emerged in both the professional literature and commercial market. These kinds of strategies typically target antecedents or consequences of social behavior and are designed to develop and to refine pro-social behavior (Bloomquist & Schnell, 2002) by promoting skill acquisition, enhancing skill performance, and eliminating problem behaviors (Gresham, 1998).

Acquisition and skill enhancement. If a child does not have a social skill in his or her repertoire, does not know how to perform a particular step in a behavioral sequence, or executes the skill awkwardly or ineffectively, training in skill acquisition is recommended (Elliot & Gresham, 1992). Such training usually involves modeling, coaching, behavioral rehearsal, and social problem-solving strategies. Modeling is a

technique in which a behavior is learned by observing another person performing the behavior (Elliot & Gresham, 1992). Through this procedure, the social skill is taught, the targeted behavior is modeled, and then the child is asked to perform the skill through role-play procedures. Both live and symbolic modeling techniques have been used to promote social skills in children and youth (Gresham, 1985; Wandless & Prinz, 1982).

Coaching is a technique that uses verbal instruction to teach social skills (Elliot & Gresham, 1992). Three general steps are used in this approach: (a) present the social concepts or rules, (b) provide opportunities to practice the behavior, and (c) provide feedback on the quality of behavioral performances. Because of the significant verbal component of this technique, however, there are concerns regarding its use with preschool children, especially preschool children with disabilities (Elliot & Busse, 1993).

Behavioral rehearsal allows the client to practice a newly learned behavior in a structured, protective situation of role-playing (Elliot & Gresham, 1992). For example, the clinician may first ask the child to imagine being teased by another child (covert rehearsal). Second, the clinician may ask the child how he or she would respond to the teasing (verbal rehearsal). Further, the clinician may combine covert and verbal rehearsal by asking the child to recite specific behaviors that he or she would exhibit in imagined situations. Finally, the clinician may combine covert and verbal rehearsal with overt rehearsal by asking the child to role play the imagined social situation.

Social problem-solving training teaches children to evaluate interpersonal problems logically and to consider alternative, adaptive solutions (Elliot & Gresham, 1992). Typically, four steps are emphasized: (a) identify and define the problem, (b) determine alternative ways of reacting to the problem, (c) predict consequences for each

alternative reaction, and (d) select the best or most adaptive alternative solution. Social problem-solving strategies can be used with individual children or with entire classrooms. It should be noted, however, that these methods are often too cognitively complex for most preschoolers (Elliott, McKevitt, & DiPerna, 2002). Learning social skills at the preschool age generally requires more skill-oriented, externally-reinforcing procedures than offered by a more cognitive approach.

Social-skills training to enhance skill performance include techniques that manipulate antecedents and consequences (Elliot & Gresham, 1992). The manipulation of antecedents sets the stage for positive interaction, thereby promoting successful relationships. Such training usually involves peer-mediated interventions (Sheridan & Walker, 1999), cuing or prompting (Sheridan & Walker, 1999), and correspondence training (Risley & Hart, 1968).

Intervention strategies can also be peer-mediated. One such strategy for remediating social-skill acquisition deficits is peer modeling (Kohler & Strain, 1990). Cooperative learning is another peer-mediated strategy in which small groups of students are assigned an academic task that requires the group to work toward a common goal (Slavin, 1980). Supported social relationships in natural settings structure interactions among children. For example, intervention strategies may be designed to increase opportunities for students with disabilities to have age and context-appropriate activities (Forest, 1987) or to teach students necessary social interaction and game-playing skills to engage effectively in these activities (Meyers, 1985).

Another peer-mediated strategy is peer initiations. Here, confederate peers initiate and maintain social interaction with targeted children (Hendrickson, Strain, Tremblay, &

Shores, 1982; Sisson, Van Hasselt, Hersen, & Strain, 1985). For example, play organizers can suggest an idea for a play activity. Also, confederate peers can share an object or cooperatively play with an object, provide assistance to another child by offering help, initiate positive physical contact such as giving a “high five,” initiate conversation, or compliment the target child. Peer-initiation strategies are effective for children who show low rates of social interaction, but do not have disruptive behavior problems (Kohler & Strain, 1990).

Cuing or prompting techniques use verbal and nonverbal signals to encourage pro-social behaviors (Kohler & Strain, 1990). For example, a teacher could prompt a child to say, “thank you,” to another student or to ask another student to join an activity. Behavioral momentum, a variation of prompting procedures, requires a teacher or other person first to ask the child to complete a series of requests that are very likely to be performed (high probability request) and then immediately ask the child to perform a task that he or she is less likely to perform (low-probability request) (Davis, Brady, Hamilton, McEvoy, & Williams, 1994). This technique is designed to increase rates of compliance and interactions among children with disabilities and typically developing peers.

Yet another approach that focuses primarily on acquisition deficits is correspondence training. This approach involves helping the child to understand the relationship between verbal and other behavior (Risley & Hart, 1968). For example, a child is asked to describe specific behaviors he or she will display during an upcoming event. The child receives reinforcement contingent on both displaying the behaviors and the correspondence with his or her previous statements.

Performance enhancement. Social-skills training techniques that manipulate

consequences are designed to reinforce pro-social behaviors (Elliot & Gresham, 1992). Such training usually involves social reinforcement-based strategies (Kohler & Strain, 1990) and differential reinforcement to eliminate competing problem behavior (Gresham, 2002). Social reinforcement-based strategies focus on overt, discrete behaviors and contingencies in the natural setting (Kohler & Strain, 1990). This approach is used with children who have the social skill in their repertoire, but are not performing the skill because of little or no reinforcement for the behavior. For example, when a student engages in appropriate social behavior, a teacher may pay attention to the child or verbally praise the child. A teacher may also initiate a system in which students may earn tokens for appropriate social behavior (Rhode, Jenson, & Reavis, 1994; Sheridan, 1995). Tokens may be exchanged for rewards such as tangible prizes or extra recess. Engaging in preferred activities may also be contingent on appropriate pro-social behavior. Group-oriented contingency systems apply consequences for behaviors of group members (Sheridan & Walker, 1999). Delivery of reinforcement to a group can be dependent on the behavior of one member of the group (dependent contingency) or on the behavior of the entire group (interdependent contingency).

Behavior contracts and school-home notes also may be used to promote pro-social behavior (Elliot & Gresham, 1992; Walker et al., 1995). Contracts may include contingencies based on an individual or a group. In addition, teachers may communicate to parents that their child engaged in appropriate social behavior while at school and therefore should be rewarded (e.g., extra television time).

Social-skills training may also include differential reinforcement to reduce competing problem behavior (Gresham, 2002; Sheridan & Walker, 1999). As previously

mentioned, competing behavior (i.e., defiance) may block skill acquisition (Gresham, 2002) or may be performed instead of pro-social behavior because it may be a more efficient and reliable form of producing reinforcement (Horner & Billingsley, 1988). Differential reinforcement of other behavior is a technique in which the clinician provides reinforcement after any behavior except the targeted problem behavior (Gresham, 2002; Sheridan & Walker, 1999). The goal of this technique is to decrease the frequency of the targeted problem behavior and to increase the frequency of all other behaviors. Technically, appropriate and inappropriate behaviors are reinforced; but practically, only appropriate behaviors are reinforced. This technique can be applied on two different time schedules, interval or momentary.

Interval differential reinforcement of other behavior necessitates reinforcement of a behavior if the targeted problem behavior has not occurred in a specified time interval (Gresham, 2002; Sheridan & Walker, 1999). For example, if the targeted problem behavior did not occur within a specified (e.g., two-minute) interval, the first behavior that occurs after the interval is reinforced. If the targeted problem behavior occurs at any time during the interval, the timer is reset to the beginning of the interval.

In momentary differential reinforcement of other behavior, behavior is examined at the end of a specified time interval. If the targeted problem behavior is not occurring at that time, the first behavior to occur thereafter is reinforced (Gresham, 2002; Sheridan & Walker, 1999). For example, a behavior is reinforced if the targeted problem behavior is not occurring at the end of a specified sampling time. Momentary schedules are posited to be more user friendly than interval schedules because the latter necessitate keeping up with time intervals and resetting the timer.

Differential reinforcement of low rates of behavior is a technique in which the clinician provides reinforcement for reductions in the frequency of target behaviors in a specified time interval (Gresham, 2002; Sheridan & Walker, 1999). In the classic version of this technique, the time elapsing between problem behaviors is gradually lengthened. For example, if a child interrupts others frequently, interruptions could be reduced in frequency by reinforcing the child for waiting five minutes between interruptions. If the child interrupts before five minutes has elapsed, the timer is reset and the five-minute waiting time is in effect. Once the child is able to refrain from interrupting for five minutes, the clinician may increase the time elapsing between interruptions to seven minutes and so on.

In full-session differential reinforcement of low rates of behavior, reinforcement is delivered when the overall frequency of a targeted problem behavior is reduced in a specified time session (Gresham, 2002; Sheridan & Walker, 1999). The difference between classic differential of low rates of behavior and full-session differential reinforcement of low rates of behavior is that the latter does not require longer time elapsing between problem behaviors. Instead, the requirement is that the overall frequency of a targeted problem behavior in a specified time interval is reduced. For example, a teacher may set a criterion of five or fewer interruptions during a 15-minute math lesson. If the criterion is met, the child would receive reinforcement. This technique is considered to be more use friendly than classic differential reinforcement of low rates of behavior. In addition, the full-session version also may be used within the context of a group-contingency plan.

Differential reinforcement of incompatible behavior is a technique in which

behaviors that are incompatible with the targeted problem behavior are reinforced (Gresham, 2002; Sheridan & Walker, 1999). This technique reduces the frequency of competing problem behaviors because pro-social behaviors that are incompatible with the targeted problem behavior are increased in frequency. This technique is effective because of the relative reinforcement for each incompatible behavior. It often is a preferred technique because rather than focusing on reducing frequencies of problem behavior, it focuses on increasing frequencies of pro-social behavior. For example, if a child shouts out answers in class, the teacher may reinforce children when they raise their hand and wait until called on to answer.

Efficacy of Child-focused Social-skill Training

Sukhodolsky, Kassinove, and Gorman (2004) meta-analyzed 21 published studies and 19 unpublished studies completed between 1968 and 1997 assessing the efficacy of a variety of child-focused social-skills training treatments that targeted anger-related covert and overt behaviors. A total of 1,953 children and adolescents were included in the analysis. The mean age of the participants per treatment group ranged from 7 to 17.2 years. The terms *anger*, *aggression*, *oppositional behavior*, and *antisocial behavior* were used to locate the pool of studies.

From the 40 studies that produced 51 independent sub-samples, four categories of training were established: (a) skills development that included treatments (i.e., modeling and behavioral rehearsal) and targeted overt anger expression to develop appropriate social behaviors, (b) affective education (i.e., emotion identification, self-monitoring of anger arousal, and relaxation), (c) problem-solving strategies that included treatments (i.e., attributional training, self-instruction, and consequential thinking) and targeted

cognitive deficits and distortions, and (d) eclectic or multimodal treatment for samples that used multiple strategies and targeted two or more components of anger (Sukhodolsky et al., 2004). Anger was defined as a subjective, negatively felt state associated with cognitive deficits and distortions and maladaptive behaviors including emotional experiences (varying from annoyance to rage), behavioral patterns (varying from social withdrawal to physical aggression), and cognitive phenomena (attributions of blame and mental rumination). In addition to the four treatment categories, each study was coded on 11 technique variables: Instruction, discussion, modeling, role-playing, feedback, emotion identification, relaxation, self-instruction, exposure, homework assignments, and reinforcement.

Treatment outcome was measured according to two classifications: Source of information and domain of measurement (Sukhodolsky et al., 2004). The source of information included self-report, direct observation, life record or archival data, teacher rating, parent rating, and peer rating/nomination. The domain of measurement consisted of self-control, anger experience, physical aggression, problem solving, and social skills.

Overall findings yielded a $d = 0.67$, indicating that the mean of the treated group was at the 73rd percentile compared to the untreated group (that was set at the 50th percentile). In other words, the difference between the mean of the treatment groups and the mean of the untreated groups was equivalent to about two thirds of a standard deviation (Sukhodolsky et al., 2004). Differential effects, however, were found for category of training. Skills development ($d = 0.79$, 76th percentile) and eclectic treatments ($d = 0.74$, 76th percentile) were shown to be more effective than affective education ($d = 0.36$, 62nd percentile). Problem-solving treatments ($d = 0.67$, 73rd percentile) were not

found to differ from the other treatment categories, possibly due to the relatively small number of studies per treatment category. The authors indicated that viewing results from these categories on a scale from “less behavioral” (affective education and problem solving) to “more behavioral” (eclectic treatments and skills development), while not statistically significant, suggests that treatments that taught actual behaviors tended to be more effective than treatments that aimed to modify internal constructs hypothesized to be related to targeted behaviors. Nevertheless, these differences were not reliably different as assessed through statistical analyses.

Of the specific therapeutic techniques investigated (i.e., instruction, discussion, modeling, role-playing, feedback, emotion identification, relaxation, self-instruction, exposure, homework assignments, and reinforcement), only feedback ($\rho = .55, p < .001$), modeling ($\rho = .46, p < .001$), and homework ($\rho = .32, p < .05$) were found to be related to the magnitude of the overall effect size (Sukhodolsky et al., 2004). The authors noted that the effectiveness of treatment increased as the amount of modeling and feedback increased. Also, the use of homework was reliably and positively related to treatment outcomes. There was no mention, however, of analyses conducted to assess differences among these effect sizes.

No differences were found for effectiveness of treatment type (i.e., skills development, affective education, problem-solving, and eclectic or multimodal treatment) by the domain of measurement (i.e., self-control, anger experience, physical aggression, problem solving, and social skills). Through qualitative inspection of the effect sizes yielded by the treatment types within the measurement domains, however, the authors of this study reported an interpretable trend (Sukhodolsky et al., 2004). Although no

quantitative analyses were reported that addressed differences among effect sizes, the researchers observed that for skills development and eclectic treatments, effect sizes in the physical aggression, anger experience, and social skills domain were within a similar range ($d = 0.65$ to 0.85 , 73rd to 74th percentile). The social-skills domain, however, showed the highest relative values of effect sizes compared with the other two domains suggesting that measures (i.e., social skills) of a construct targeted for intervention may show higher treatment effects than measures (i.e., aggressiveness, anger expression) that are less closely related to the intervention target. Of course, the reliability of these reported differences was not empirically assessed.

Also, improvement in the anger-experience category was twice as great for problem-solving training ($d = 1.05$, 84th percentile) than for affective education ($d = 0.52$, 69th percentile) (Sukhodolsky et al., 2004). An anger experience is typically viewed as a subjective reflection of physiological arousal under circumstances of being wronged or mistreated, a feeling state rather than a cognitive state. Surprisingly, the affective education treatments (i.e., relaxation, positive imagery, education in emotions) appeared to be less helpful than problem-solving treatments (i.e., learning how to think about causes, consequences, and solutions to anger-provoking situations).

Various follow-up analyses were conducted. No relationship was found between length of treatment and the magnitude of treatment outcome (Sukhodolsky et al., 2004). Treatment length for the included samples ranged from 2 to 30 hours, denoting relatively short-term treatment duration. Also, both group- and individual-treatment formats were found to be equally effective. Additionally, the overall treatment outcome for children in the 7 to 10-year-old range ($d = 0.54$, 69th percentile) tended to be lower than the outcome

for adolescents between 15 and 17 years old ($d = 0.74$, 76th percentile). Samples that comprised both male and female participants yielded greater effect sizes than samples that included only males. Finally, participants classified in the moderate range of problem severity showed higher effect-size values ($d = 0.80$, 79th percentile) than children classified in the mild ($d = 0.57$, 69th percentile) or in the severe ($d = 0.59$, 69th percentile) ranges. Thus, children with moderate anger-related problems, but not with a history of violent behavior, appeared to benefit most from these child-focused treatments.

Current social-skills training programs typically employ multiple social-skills strategies within the program with the focus of treatment on the child, parent, teacher, or a combination of treatment agents. Research-based interventions for children with emotional and behavior disorders (Bear, Webster-Stratton, Furlong, & Rhee, 2000) support recommendations emphasizing comprehensive interventions with sufficient exemplars. Training diversely involves training across stimuli (e.g., persons and settings) that are common to the natural setting.

Parent Training

Mounting evidence supports the notion that a parent component to intervention is important to treatment efficacy for individuals with externalizing behavior problems (Brestan & Eyeberg, 1998; Eddy, Reid, & Curry, 2002; Kazdin, 1997). Indeed, parent training is among the most successful interventions to reduce disruptive behaviors in youngsters (Eddy et al., 2002). Parents are typically taught child-management skills that include effective discipline strategies that incorporate contingencies, follow through, developmentally reasonable expectations, appropriate child supervision, positive reinforcement, and modeling and teaching effective problem-solving skills (Dishion,

Andrews, Kavanagh, & Soberman, 1996; Kazdin, 1997). Parents are also taught to identify problems, to observe and record behavior, to use social and nonsocial reinforcers effectively for appropriate pro-social behavior, and to withdraw reinforcers effectively for undesirable behavior (Patterson, Reid, & Dishion, 1992).

Research (Long, Forehand, Wierson, & Morgan, 1994; Serketich & Dumas, 1996; Webster-Stratton, 1990, 1994) supports the use of parent training in treating children with disruptive behaviors. Indeed, results have shown that the majority of children who were displaying behavior problems whose parents received child-management training performed in the normal range on measures of internalizing and externalizing behaviors, social competence, emotional adjustment, and relationships with parents. In addition, a meta-analysis (Serketich & Dumas, 1996) on parent training for children displaying disruptive behavior indicated that on all child social-competence outcome measures, the treatment group had a better outcome than about 80% of the control group.

The efficacy of parent-training treatment options underscores the importance of including this kind of training in treatment with this population. It is important to note, however, that about 35% of children of parents who received parent training still may exhibit clinically significant levels of externalizing behavior (Webster-Stratton, 1985). Thus, although parent training is clearly an important component in treatment programs, additional factors influencing treatment outcome should be considered when designing an intervention program for this population.

Factors Influencing Treatment Outcome

Researchers (Bear et al., 2000; Walker et al., 1995) recommend observation of various factors in the design and implementation of intervention for children displaying

externalizing behavior to increase treatment efficacy. First, treatment should be comprehensive, targeting multiple risk and protective factors (Bear et al., 2000). Risk factors influencing the development of disruptive behavior include being male, low socio-economic status, being a minority, psychopathology, ineffective parent child-management skills, rejection by peers and teachers, and poor school attitude/performance (Lipsey & Derzon, 1998). Consideration of the number of risk factors present is important (Kopp, 1994; Lambert, 1988). Although a single risk factor may certainly have an impact, multiple risk factors have been shown to be especially deleterious. Moreover, risk factors may affect outcomes in either additive or interactive fashions (e.g., Lengue, Wolchik, Sandler, & West, 2000). Protective factors are oftentimes the opposite of risk factors. For example, high socio-economic status, effective parent management skills, and positive school attitude/performance protect children from developing externalizing behaviors. Thus, risk and protective factors clearly extend beyond individual characteristics (i.e., good intellectual functioning, sociable, easygoing disposition, high self-esteem, talents, faith), and include environmental and social contextual variables as well (i.e., warm parent-child bond, socioeconomic advantages, positive relationships with extended family and those outside the family context such as with organizations or teachers). Second, interventions should be broad-based by adopting a systems perspective in which schools, families, agencies, and communities work together (Bear et al., 2000; Walker et al., 1995). Third, interventions should be conceptually and empirically justified (Bear et al., 2000). Fourth, clinicians should be cognizant of the importance of early intervention when disruptive behavior first appears (Bear et al., 2000; Walker et al., 1995). Kazdin (1995) affirmed that treatment for early-onset disruptive behavior is most

successful with children eight years of age and younger. Indeed, Moffitt et al. (2002) assert that adolescents with early-onset disruptive behavior have a particularly poor prognosis, even after treatment. Fifth, interventions should be sensitive to developmental differences in behavior, the determinants of behavior, and the appropriateness of interventions (e.g., sensitive to cultural differences) (Bear et al., 2000). Sixth, treatment should be intensive and sustained over time (Bear et al., 2000; Walker et al., 1995). Finally, fidelity of intervention is also important in assessing treatment outcome (Walker et al., 1995).

Fidelity of treatment, or treatment integrity, refers to the degree to which intervention procedures are implemented as intended (Bear et al., 2000; Gresham, 1989). Treatment integrity is an important aspect in identification of treatment efficacy. Failure to implement intervention strategies with integrity threatens one's ability to attribute changes in behavior to the intervention program (Gresham, Gansle, & Noell, 1993). Clearly, the cause of behavior change cannot be attributed to the treatment if the intervention procedures were not implemented as intended. Thus, to strengthen the impact of findings related to intervention efficacy, observation of treatment integrity is important. Various methods available to assess treatment integrity include (a) direct systematic observation; (b) self-reporting techniques; (c) explicit, written treatment protocols; (d) feedback from consultants to consultees regarding integrity; and (e) intermittent integrity checks (Elliot & Busse, 1993).

Although researchers (Bear et al., 2000; Walker et al., 1995) recommend observation of particular factors in the design and implementation of intervention for individuals with emotional and behavioral disorders, analyses of treatment specific to

social-skills training with these children and youth have yielded mixed results with regard to some of these factors. For example, no clear pattern has been noted between the effects of age and children’s participation in social-skills training (Beelmann et al., 1994; Denham & Almeida, 1987; Losel & Beelmann, 2003; Schneider, (1992); Schneider & Byrne, 1985; Whipple, 2006) or length of treatment (Denham & Almeida, 1987; Schneider, 1992; Whipple, 2006). In addition, Whipple (2006) found differential effects for ethnic composition of sample and treatment efficacy. The following review of these seven studies is summarized in Table 1. This review demonstrates the contribution each meta-analysis has made to our understanding of the efficacy of social-skills training with children and youth displaying high levels of aggression or with a behavior disorder. The average percentile standing of the average treated (or experimental) participant relative to the average untreated (or control) participant is provided along with d and r effect-size estimates for ease of interpretation of the efficacy of the various social-skills interventions (Rosnow & Rosenthal, 1996). As noted previously, d represents the difference (in standard deviation units) between the means of the treated and non-treated groups; r represents the estimated correlation between the dependent and independent variables.

Table 1

Factors Influencing Social-Skill Training

Factor	Source	Result
Age	Denham & Almeida (1987)	Treatment effects stronger for younger children in sample aged 3 to 12 years.

Factor	Source	Result
	Schneider & Byrne (1985)	Follow-up analyses indicated that children in the 5- to 10-year-old age group derived fewer benefits than either preschool children aged 3 to 4 years or children 14 to 19 years.
	Schneider (1992)	The age of participants not related to treatment efficacy.
	Beelmann et al., (1994)	Although training was associated with changes in all age groups ranging from 6 to 15 years, the older children seemed to benefit more from training than did younger children.
	Losel & Beelmann (2003)	Although age was not a significant moderator of total postintervention outcome, follow-up analyses showed that the youngest group, aged 4 to 6 years, and the oldest group, aged 13 years and older, revealed larger effects than children in the 7 to 12 year age group.
	Whipple (2006)	The age of participant correlated poorly with post-treatment aggression

Factor	Source	Result levels.
Gender	Whipple (2006)	Gender of participants correlated poorly with treatment outcome.
Treatment duration	Denham & Almeida (1987)	Longer-duration training (> 40 sessions) was more effective than shorter-duration training.
	Schneider & Byrne (1985)	The number of treatment sessions, which ranged from 1 to 80, was not related to treatment outcome.
	Whipple (2006)	The length for which children received social-skill training did not contribute to the prediction of post-treatment aggression levels.
Ethnicity	Whipple (2006)	As percentage of Caucasians in the sample increased, aggression levels decreased post-treatment.

Note. See Bibliography for full citation of source.

Meta-analyses of Social-Skills Training

In a meta-analysis of social problem-solving training programs, Denham and Almeida (1987) found that these programs had a strong impact on children's social problem-solving skills ($d = 0.78$, 76th percentile) and less of an effect on their aggression levels ($d = 0.26$, 58th percentile), although the reliability of these differences was not reported. Children in the sample were classified as at-risk for behavior disorder, non-

disordered, or special-needs. Participants in the sample were between 3 and 12 years old. Gender and ethnicity of participants were not reported.

Intervention effects, whether the outcome was interpersonal cognitive problem-solving measures or behavioral effects (i.e., social behavior), were stronger for the younger children in the sample than for the older participants ($p < .01$) (Denham & Almeida, 1987). Specific ages at which treatment effects were strongest, however, were not reported. Also, longer-duration training was found to be more effective than shorter-duration training ($p < .05$). Specifically, according to teacher ratings, treatments lasting for 40 or more sessions lead to higher interpersonal cognitive-problem solving skills.

Schneider and Byrne (1985) performed a meta-analysis of 51 studies on the effects of social-skills training with children and youth between 3 and 19 years old. Participants were classified as normal, withdrawn, learning disabled, behaviorally disordered, or developmentally handicapped. Participants' gender and ethnicity were not reported. Samples included in the analysis used either a control group or a quasi-treatment comparison group and a quantitative measure of social behavior.

Based on criteria proposed by Schneider and Byrne (1985), an effect size of $r = .31$ (74.5th percentile) collapsed across modeling, operant procedures, coaching, and social-cognitive treatment categories on measures of social interaction, aggression, and social-cognition was found. Observed separately, operant procedures had the strongest effect ($r = .39$, 80.5th percentile), followed by modeling ($r = .35$, 77.5th percentile), coaching ($r = .31$, 74.5th percentile), and social-cognitive procedures ($r = .27$, 70.5th percentile). Follow-up analyses indicated that children in the 5- to 10-year-old age group derived fewer benefits from social-skills training than either preschool children aged 3 to

4 years or children 14 to 19 years old ($p < .05$). Also, shorter length interventions tended to be associated with higher treatment benefits than longer duration programs. There were no reliable differences among the treatment duration blocks (i.e., less than 5 days, 5-20 days, 21-50 days, and more than 50 days). Thus, there was no empirical evidence to conclude that shorter-length interventions were differentially effective than longer-duration programs.

Schneider (1992) conducted a meta-analysis as a follow up to the Schneider and Byrne (1985) synthesis to examine the efficacy of didactic methods to enhance children's peer relations in 79 studies published between 1942 and 1987. Children's ages ranged between 5 to 17 years. Participants were categorized as normal, unpopular, withdrawn, or aggressive. Participants' gender and ethnic background were not reported. More stringent study-selection criteria were used for this analysis compared to the initial study (Schneider & Byrne, 1985). Selected studies included a control group (i.e., non-treatment, wait-list, or placebo) and a quantitative measure of social behavior.

Overall, this multi-technique program (i.e., modeling, operant procedures, coaching, and social-cognitive treatments) was shown to enhance ($r = .40$, 80.5th percentile) peer relations, academic achievement, and self-concept ($p < .001$) (Schneider, 1992). Effect sizes limited to measures of social behavior (e.g., excluding academic achievement and self-concept) yielded a higher treatment outcome ($r = .47$, 84.5th percentile) ($p < .05$), although the reliability of the difference was not reported. The age of the participants was not related to treatment efficacy. In addition, the number of treatment sessions, which ranged between 1 and 80, was found to be unrelated to treatment outcome. These effect sizes were posited to reflect the disproportionate impact

of a very few studies, which utilized 12 to 17 outcome measures, most of which found no significant results.

Beelmann et al., (1994) performed a meta-analysis on the outcomes of social-skills training with children between 3 to 15 years old in 49 studies published between 1981 and 1990. Participants were classified as having externalizing syndromes (i.e., aggressiveness, Conduct Disorder, and childhood rejection), internalizing syndromes (i.e., social withdrawal, depression, and childhood neglect), intellectual problems (i.e., learning disability and mental retardation), at-risk groups (i.e., social deprivation and children confronted with critical life-events), and children with no indicated problems. Participants' gender and ethnicities were not reported. The social-skills training programs incorporated behavioral, cognitive, or cognitive-behavioral strategies directed toward training and/or modifying motor, cognitive, and affective components of children's social behavior. Samples included in the analysis used an experimental or quasi-experimental design with at least one control group.

Overall results yielded a $d = 0.47$ (66th percentile) ($p < .05$) for children's social-cognitive skills, social-interaction skills, social-adjustment skills, and self-regulated cognitive-affective skills post-treatment compared to baseline scores (Beelmann et al., 1994). Children classified as having externalizing problems, however, had lower treatment effects ($d = 0.36$, 62nd percentile) ($p < .05$) on measures of social adjustment (i.e., aggression and popularity). Although social-skill training was associated with changes in all age groups, the older children in the sample seemed to benefit more from training than did younger children in the sample. Specifically, children 3 to 5 years old were found to have less positive change in behavior ($d = 0.11$, 54th percentile) than

participants aged 6 to 8 years ($d = 0.19$, 54th percentile), 9 to 11 years ($d = 0.17$, 54th percentile), and 12 to 15 years ($d = 0.31$, 67th percentile) ($p < .05$). Also, there were no differences among various kinds of social-skills training techniques (i.e., behavioral, social problem-solving). Although the percentage of number of hours of treatment and number of sessions were reported for many of the included samples, no results were reported for treatment efficacy by treatment duration.

Losel and Beelmann (2003) meta-analyzed 84 studies published between 1972 to 2000 that examined the effect of social-skills training with children and youth 4 to 18 years old classified as at risk for developing disruptive behavior patterns because of social-skills deficits, a multiple-problem family milieu (i.e., antisocial parents, low socioeconomic status), and/or displaying disruptive behavior. Participants' gender and ethnicities were not reported. Only studies using a randomized-treatment versus control-group design were included in the analysis. Various kinds of treatments including behavioral, cognitive, cognitive-behavioral, or counseling techniques were used among the samples. Treatment length ranged between about 1 month and greater than 12 months.

Overall treatment outcome showed a $d = 0.38$ (62nd percentile) on measures of social skills and social-cognitive skills (Losel & Beelmann, 2003). Although age was not a significant moderator of total postintervention outcome, follow-up analyses showed that the youngest group aged 4 to 6 years ($d = 0.74$, 76th percentile) and the oldest group aged 13 years and older ($d = 0.78$, 76th percentile) revealed larger effects than children in the 7 to 12 year age group ($d = 0.20$, 58th percentile) ($p < .001$). The findings for the oldest group, however, were based on only two studies. When various outcome criteria were

considered, the 4 to 6 year age group had significant effects only for social and social-cognitive skills and not on disruptive behavior measures. The other groups, 7 to 12 years ($d = 0.27$, 58th percentile) and older than 12 years ($d = 0.39$, 62nd percentile), showed changes in disruptive behavior post-treatment. Also, no differences were found for kind of treatment administered. Specifically, interventions that included behavioral, cognitive, cognitive-behavioral, or psychotherapy components were equally effective. Treatment efficacy by treatment duration was not reported.

Researchers (Ang & Hughes, 2002) meta-analyzed 38 studies published between 1975 and 1999 assessing the efficacy of a variety of social-skills training techniques (i.e., coaching, modeling, guided practice, instruction, discussion, and games) in children and adolescents with disruptive behavior patterns. Participants were between 6 and 18 years old and were described as having the following classifications of externalizing behavior problems: Oppositional Defiant Disorder; Conduct Disorder; aggression; violent behavior; and delinquency. Of the 38 studies, 18 did not report participants' ethnicity. The remaining 20 reported the following ethnic representations: 52.5% African American, 47.7% Caucasian, and 1.9% Hispanic. Seventy-three percent of the studies included in the analysis used a randomized-treatment versus control-group design. The average treatment length was about 13 weeks. Overall findings yielded a $d = 0.55$ (69th percentile) on disruptive behavior ratings and skill-acquisition measures for participants who received treatment compared to those in control groups. Results were not reported for efficacy of treatment by participants' ages, genders, treatment lengths, or ethnicities.

Whipple (2006) meta-analyzed 12 studies published between 1990 and 2005, producing 13 independent sub-samples, that employed multiple social-skills training

strategies based on a variety of theoretical frameworks (i.e., behavioral, social learning, cognitive-behavioral). The social-skills training programs included parent training as one focus of intervention in addition to at least one other intervention agent (e.g., clinician, teacher). The analysis used a pre-post contrast design. Participants were classified as having a behavior disorder (i.e., Oppositional Defiant Disorder, Conduct Disorder, or emotional disturbance) or displaying high levels of aggressive behavior. The studies included in the analysis had sample sizes that ranged between 22 to 445 children per sample with a total sample size of 1,179. The children's ages ranged between 3 to 12 years. One sample was classified as predominantly female with the 12 remaining samples classified as predominantly male. The duration of time for which children participated in social-skills training ranged between 3 and 18 months. Six samples were classified as predominantly Caucasian, five samples were classified as predominantly minority status, and two samples did not report ethnic background of participants. The analysis focused on parent and teacher perceptions of children/students' behavior change post-treatment. Rates of aggression from each sample were used as the measure of social-skills training outcome.

The overall post-treatment average was $g = -0.28$ ($p < .001$) (Whipple, 2006). The standardized mean difference (d) was multiplied by a correction factor (j) to compute Hedges' g and the corresponding standard error and variance to correct for small sample size (Hedges & Olkin, 1985). Follow-up analyses of the perceived effects' of children's behavior change by type of rater indicated that although both parents and teachers perceived decreases in children's aggressive behavior after participation in social-skills training, the teachers' post-treatment ratings ($g = -0.32$; $p < .001$) indicated more

behavior change than did parents' ratings ($g = -0.12$; $p < .001$). The reliability of the difference, however, was not reported. Also, the age of the participants was found to correlate poorly with post-treatment aggression levels. In addition, the length for which children received social-skills training did not contribute to the prediction of post-treatment aggression levels. Finally, the percentage of Caucasians in the sample contributed to the prediction of post-treatment aggression levels. Specifically, as the percentage of Caucasians in the sample increased, aggression levels decreased post-treatment. Treatment efficacy by gender of participants was not reported due to the variable being omitted from the multiple regression analysis as a result of poor correlation with the dependent variable.

In summary, factors such as children's ages (Beelmann et al., 1994; Denham & Almeida, 1987; Losel & Beelmann, 2003; Schneider, 1992; Schneider & Byrne, 1985), the length of treatment (Denham & Almeida, 1987; Schneider, 1992; Whipple, 2006), and ethnic background (Whipple, 2006) are posited to influence treatment efficacy. Indeed, the degree of intensity of the program necessary for optimal effectiveness is posited to depend largely on the age of the child at the time of treatment (Walker et al., 1995). Specifically, treating disruptive behavior in general has been found to be most successful with children eight years of age and younger (Kazdin, 1995). Prior meta-analytic reviews (Beelmann et al., 1994; Denham & Almeida, 1987; Losel & Beelmann, 2003; Schneider, 1992; Schneider & Byrne, 1985; Whipple, 2006) on the efficacy of social-skills training and age of participants, however, have yielded mixed results. Denham and Almeida (1987) found stronger social-skills training treatment effects for younger children in a sample of children 3 to 12 years old. Beelmann et al., 1994, in

contrast, found higher social-skills training outcomes for older children in a sample aged 6 to 15 years. Other researchers (Losel & Beelmann, 2003; Schneider and Byrne, 1985), on the other hand, found lower treatment effects for elementary-aged children compared to pre-school aged children and adolescents. Finally, Schneider (1992) and Whipple (2006) found that age of participants, in general, was poorly related to post-treatment outcome.

Researchers (Bear et al., 2000; Walker et al., 1995) also suggest that the length of treatment must be sufficient to produce lasting change in areas of social competence. Prior meta-analytic reviews (Denham & Almeida, 1987; Schneider 1992; Whipple, 2006) have yielded mixed results on the efficacy of social-skills training and treatment length. A quantitative review (Denham & Almeida, 1987) found greater treatment effects for longer-duration social-skills training compared to shorter-duration training. Another analysis (Schneider, 1992), however, found no relationship between overall social-skills training treatment efficacy and treatment length. Whipple (2006) found that duration of social-skills training did not contribute to the prediction of post-treatment aggression levels. The results may have been influenced by the higher number of samples included in the various meta-analyses that received shorter-duration treatment. For example, most samples received treatment for three months or less, with only a couple meta-analyses reporting samples in treatment 12 to 18 months. Therefore, it is quite possible that the findings result from the heavy weighting of shorter-duration treatment studies over longer-duration treatments.

The appropriateness of interventions is also affirmed to be an important factor in treatment outcomes (Bear et al., 2000). Although prior meta-analytic reviews on social-

skills training and children showing behavioral disorders or high levels of aggression did not report treatment efficacy with regard to ethnic background of the participants (Ang & Hughes, 2002; Beelmann et al., 1994; Denham & Almeida, 1987; Losel & Beelmann, 2003; Schneider, 1992; Schneider & Byrne, 1985). Whipple (2006) found that as the percentage of Caucasians in the sample increased, the aggression levels decreased post-treatment. Thus, it was hypothesized that ethnicity considerations with regard to the development of instructional programs and trainer characteristics may have played a role in the differential effects of samples classified as predominantly Caucasian and those classified as predominantly minority status.

Assessing Treatment Outcome

Overall weak social-skills training effects have been associated with the use of assessments that show little correspondence between the social behaviors taught and the behaviors that are assessed (Gresham, 2002). A multisource, multisetting, multimethod approach to social-skills assessment is considered to be “best practice” (Gresham, 1995). This ecological-contextual perspective considers child characteristics, rating methods, and the social context.

Assessment of social skills within an ecological framework includes consideration of child variables (Gresham, 2002). Child variables include the child’s behavioral skill level, cognitive events, language abilities, developmental status, gender, age, and culture. Although these child variables are not included in assessing treatment outcome, the influence that these characteristics have on a child’s effectiveness in a social setting should be considered.

The relevance and sensitivity of dependent measures in social-skills training are

posited to influence evaluation of treatment outcome (Gresham, 2002). Social-skills measures may be classified based on a social-validity criterion (Gresham, 1983). Social validity assessments include Type I, II, and III measures.

Type I measures include sociometric measures (e.g., peer acceptance/rejection, friendship status) as well as parent/teacher/self-reports (e.g., rating scales, behavioral checklists) (Gresham, 1983). Although Type I measures are considered to be inherently socially valid, they have been criticized on the basis that they are not particularly sensitive in detecting short-term treatment effects (Sechrest, McKnight, & McKnight, 1996). Additionally, most social-skills training interventions are implemented for 30 hours or less, thereby possibly accounting for weak treatment effects using parent and teacher reports as outcome measures.

One important consideration of the checklist or rating scales' practical utility is the reliability of the informants (Elliott et al., 1993; Martens, 1993). Researchers (Grietens et al., 2004; Hartung, McCarthy, Mulich, & Martin, 2005) have found consistency between similar informant pairs (i.e., parents) but much lower consistency between different kinds of informants (i.e., parents and teachers, parents and adolescents) on reports of children's and adolescents' behavior problems. Results from a study (Grietens et al., 2004) examining correspondence and disagreement between mother, father, and teacher reports on 5- to 6-year-old children's problem behavior indicated that interrater agreement was low to moderate. Similar informant pairs (e.g., mother and father) showed highest agreement, whereas agreement between different kinds of informants (e.g., mother and teacher) was lowest. Other researchers (Hartung et al., 2005) examined parent-adolescent agreement on reports of inattention,

hyperactivity/impulsivity and Conduct Disorder in adolescents ranging in age from 13 to 18 years. Results of confirmatory factor analysis indicated that parents provided more consistent and valid reports of inattention and hyperactivity/impulsivity, whereas adolescents provided more consistent and valid reports of Conduct Disorder.

In addition to consistency among informants, however, clinicians also should consider the validity of ratings from different sources (Hughes, 1990; Malik & Furman, 1993). For example, Coie, Dodge, and Kupersmidt (1991) suggested that teacher reports of aggressive behaviors are usually quite valid. Parent ratings, on the other hand, are posited to underestimate social difficulties experienced by their children (Malik & Furman, 1993). Finally, student self reports sometimes do not mirror ratings given by either teachers or peers (Patterson, Kupersmidt, & Griesler, 1990). Indeed, children tend to overestimate their social abilities. Due to the varying reliability and validity among raters, a multi-informant assessment is recommended to better determine how the social competence of children and youth is viewed in the social systems (e.g., schools, mental health agencies) by significant others (parents, teachers) that tend to refer these individuals for evaluation and intervention based on these measures (Foster, Inderbitzen, & Nangle, 1993).

Common Type II measures include direct observation of social behavior in the natural environment (e.g., playground, classroom) (Gresham, 1983). Although these measures are not socially valid in and of themselves, they have been found to predict children's standing on Type I measures. Additionally, Type II measures serve as indicators of social outcomes for children.

Type III measures include analogue assessments such as behavioral role-play

tests, social problem-solving measures, and measures of social cognition (Gresham, 1983). These measures show little correspondence with Type I and Type II measures (Beelman et al., 1994; Denham & Almeida, 1987; Gresham, 1983, 1986) perhaps because they assess skill acquisition versus performance. Moreover, Type III measures have not been shown to be predictive of social outcomes of children (Gresham, 1983).

Assessment of social skills within an ecological framework includes consideration of the social context (Gresham, 2002). Evaluation of environmental conditions in the social setting and a functional analysis of social behaviors within this setting are key to this assessment. Assessment of the social context includes determination of expectations and norms for the social setting, determination of antecedents and consequences of particular social behaviors, analysis of the function that particular social behaviors serve in the social setting, and identification of socially valid behaviors in the natural environment. Techniques to evaluate the social context involve observations and analysis of features in the social setting, functional analyses of behaviors in context, observation of environmental factors that may be promoting poor social performance, and interviews across sources to identify contextually appropriate behaviors and the function of social behaviors in specific situations.

Conclusion

Overall, social-skills training intervention has been shown to be effective with children showing aggression and behavioral disorders (Ang & Hughes, 2002; Beelmann et al., 1994; Denham & Almeida, 1987; Losel & Beemann, 2003; Schneider, 1992; Schneider & Byrne, 1985; Sukhodolsky et al., 2004; Whipple, 2006). Research (Sukhodolsky et al., 2004) on child-focused treatments reported that training that teaches

behavioral techniques, as opposed to affective education, were more effective overall. Even on measures of internal anger experiences, problem-solving treatments were more effective than affective-education strategies. In addition, treatment efficacy reliably increased specifically as the amount of modeling and feedback increased. Further, the use of homework was reliably and positively related to treatment outcomes. Outcome measures (i.e., social skills) of a construct targeted for treatment were higher than measures (i.e., aggression, anger experience) less closely related to the intervention target, although the reliability of this difference was not reported.

Although child-focused treatment has been found to be beneficial (Sukhodolsky et al., 2004), researchers (Bear et al., 2000) recommend a comprehensive intervention using treatment agents across persons and settings. Parent training increasingly is viewed as an important component to treatment plans with this population (Bear et al., 2000; Eddy et al., 2002). Given the importance of a parent component in treatment plans for youngsters exhibiting disruptive behavior, it is important to note that prior meta-analyses (Ang & Hughes, 2002; Beelmann et al., 1994; Denham & Almeida, 1987; Losel & Beemann, 2003; Schneider, 1992; Schneider & Byrne, 1985) did not include in their criteria the necessity of a parent-training component to ensure optimal treatment efficacy. Although one analysis (Whipple, 2006) included parent training as a focus of the social-skills training intervention, the study used a one-group pre-post design that has the potential to substantially inflate mean effect sizes (Lipsey & Wilson, 1993) and did not assess if adding parents as treatment agents increases social-skills training benefits.

Given that about 35% of parents who received child-management training have indicated that their children's externalizing behavior remains in the clinical range and

teachers concur with this report (Webster-Stratton, 1985), treatment agents should consider factors influencing the magnitude of intervention outcomes in the development and implementation of treatment. For example, treatment programs should be comprehensive, targeting multiple risk and protective factors (e.g., negative parent-child relations, rejection by peers and teachers) (Bear et al., 2000). Also, treatment agents should be cognizant of adopting a systems perspective in which schools, families, and communities work together to prevent and treat disruptive behavior (Bear et al., 2000; Walker et al., 1995). In addition, interventions should be conceptually and empirically supported (Bear et al., 2000). Clinicians should also be cognizant of the importance of early intervention (Bear et al., 2000; Walker et al., 1995). Ideally, early-onset disruptive behavior should be addressed by the age of eight years (Kazdin, 1995). Additionally, interventions should be sensitive to developmental differences in behavior, the determinants of behavior, and the appropriateness of interventions (Bear et al., 2000). As an example, consideration of sociocultural factors associated with instructional programs and trainer characteristics may be important when working with an ethnically diverse population. Also, treatment should be intensive and sustained over time (Bear et al., 2000; Walker et al., 1995). Finally, fidelity of intervention should be closely monitored (Walker et al., 1995).

Prior meta-analyses (Beelmann et al., 1994; Denham & Almeida, 1987; Losel & Beelmann, 2003; Schneider, 1992; Schneider & Byrne, 1985; Sukhodolsky et al., 2004; Whipple, 2006) on social-skills training and children and youth with or at risk for emotional and behavioral disorders, however, have yielded mixed results on factors purported to increase the magnitude of treatment efficacy (Bear et al., 2000; Walker et

al., 1995) including age of participants (Beelmann et al., 1994; Denham & Almeida, 1987; Losel & Beelmann, 2003; Schneider, 1992; Schneider & Byrne, 1985; Sukhodolsky et al., 2004; Whipple, 2006) and length of treatment (Denham & Almeida, 1987; Schneider, 1992; Schneider & Byrne, 1985; Sukhodolsky et al., 2004; Whipple, 2006). Results have shown an increase in social-skills training effects for preschool children in a sample aged 3 to 12 years (Denham & Almeida, 1987), for older children in a sample age 6 to 15 years (Beelmann et al., 1994), for preschoolers and teenagers compared to elementary-aged children (Losel & Beelmann, 2003; Schneider & Byrne, 1985), for adolescents 15 to 17 years compared to children 7 to 10 years (Sukhodolsky et al., 2004), and no significant relationship between age of participant and treatment efficacy (Schneider, 1992; Whipple, 2006). Results also have indicated an increase in treatment effects for longer-duration social-skills training (Denham & Almeida, 1987) and no relationship between length of intervention and treatment efficacy (Schneider, 1992; Sukhodolsky et al., 2004; Whipple, 2006).

Prior meta-analyses (Sukhodolsky et al., 2004; Whipple, 2006) on social-skills training and children and youth with or at risk for emotional and behavioral disorder indicated that composition of the sample was related to treatment efficacy. First, ethnicity was found to relate to treatment efficacy (Whipple, 2006). Specifically, as the percentage of Caucasians in the sample increased, aggression levels post-treatment decreased. Also, the predominant gender of the sample was found to relate to social-skills training outcome (Sukhodolsky et al., 2004). Samples that comprised both male and female participants benefited more from social-skills training than samples that included only males. Overall, limited evidence exists relating children's age, ethnic background, and

gender characteristics to social-skills treatment efficacy, and affects of treatment length on efficacy of treatment is unclear.

A multisource, multisetting, multimethod approach to assessing the efficacy of social-skills training is recommended (Gresham, 1995). This ecological-contextual approach considers child characteristics (e.g., gender, age, culture), rating methods (e.g., sociometric measures, informant reports, observations, analogue measures, and problem-solving measures), and evaluation of the social context. With regard to informant reports, research (Grietens et al., 2004) has found consistency between ratings by mothers and fathers, but low agreement between mothers' and teachers' ratings. Researchers (Coie et al., 1991) suggest that teacher reports of students' social competence are usually quite valid. Parent ratings, on the other hand, have been found to underestimate social difficulties experienced by their children (Malik & Furman, 1993). Adolescents' self reports of Conduct Disorder have been found to be more consistent and valid than parents' reports of their children's diagnosis of the disorder. Other researchers (Patterson et al., 1990), however, assert that student self reports oftentimes are not valid, and do not mirroring ratings given by either teachers or peers (Patterson et al., 1990). Specifically, children tended to overestimate their social abilities. Due to the varying reliability and validity among raters, a multi-informant assessment is recommended to determine how the social competence of children and youth is viewed in the social systems (e.g., schools, mental health agencies) by significant others (parents, teachers) that tend to refer these individuals for evaluation and intervention based on these measures (Foster et al., 1993).

Thus, the current study consisted of an examination of the efficacy of social-skills training on children and youths' social competence using meta-analytic techniques. The

primary goal of this dissertation was to synthesize the results of particular kinds of social-skills interventions that have been used with children displaying disruptive behavioral patterns. More specifically, social-skills interventions that incorporate a parent-training component were compared to social-skill interventions not including parents as treatment agents. Additionally, the differential effects of the number of settings (e.g., home, classroom, clinic) in which the target children received treatment were assessed. Moreover, in order to assess the magnitude of outcomes, the synthesis focused on those studies that have used group contrast, treatment- versus control-group designs. Finally, in an effort to assess intervention outcomes more directly, the synthesis also focused on treatment outcomes that are consistent with constructs targeted for the social-skills interventions, such as social skillfulness and competence, versus those that are less directly related to treatment outcomes, such as aggression (cf. Whipple, 2006). A multisource, multisetting, multimethod assessment was used to measure overall post-treatment social competence.

Research Hypotheses and Predictions

The aims of this study were focused on four constructs: (a) externalizing behavior, (b) social-skills training, (c) type of treatment agent, and (d) number of treatment agents. The research hypotheses were as follows:

Hypothesis 1

Social-skills training programs that incorporate a parent training component will be more beneficial for children and youth displaying externalizing behavior than programs not including parents as treatment agents (Brestan & Eyberg, 1998; Eddy et al., 2002; Kazdin, 1997; Long et al., 1994; Serketich & Dumas, 1996; Webster-Stratton,

1990, 1994).

Hypothesis 2

Social-skills interventions targeting multiple treatment agents will be more beneficial for children and youth displaying disruptive behavior than interventions not training across treatment agents (Bear et al., 2000; Walker et al., 1995).

Method

Procedure

Literature searches. Studies were located using various search strategies. The data sets for this study were identified through literature searches on three computerized databases, the Educational Resources Information Center (ERIC) documents, PsycINFO, and Dissertation Abstracts (ProQuest Digital Dissertations). Additional search procedures included investigation of non-computerized databases, using names of authors affiliated with social-skills training and social-competence promotion as key-word descriptors, and reviews of reference lists from acquired articles. Individual authors were contacted for articles unavailable through the Higher Education Library Information Network (HELIN), accessed through the University of Rhode Island library consortium.

Inclusion criteria. Studies involving the efficacy of social-skills training with children displaying externalizing behavior were considered for analysis. Next, the study had to employ a group-contrast, treatment- versus control-group design. Finally, the study had to provide a measure of social competence (i.e., parent, teacher, or peer behavior rating scale) to assess treatment efficacy.

Exclusion criteria. Due to varying reliability and validity of behavior rating scales interpreted in various languages, non-English language studies were excluded from this

analysis.

Data extraction. Once articles were identified, study-level and effect-size measures were extracted. Issues related to the reliability of coding include the consistency with which two different coders record information from the same study and the consistency with which a single coder records information from session to session (Lipsey & Wilson, 2001). In the former instance, a subsample of the studies can be coded by more than one individual and the results compared for consistency. In the latter instance, a randomly selected subsample of coded studies can be selected (after a sufficient time has passed so that the coder does not have the recorded information on his/her mind), have the individual recode the studies, and compare the consistency. The latter option was employed given that the nature of the meta-analysis was student research. As shown in Appendix A and discussed in the results section, study-level information extracted from each data set included: (a) publication year, (b) assignment of participating children to treatment and control group (random), (c) nature of control group (no treatment, wait-list, treatment as usual), (d) treatment agent (parent, teacher, clinician, peers), (e) measure of dependent variable (type of behavior rating scale), (f) rater for dependent variable (parent, teacher, peer), (g) attrition rate, (h) author(s) suggestion of observation of treatment integrity (follow manual, supervision). Sample-level information extracted from each data set included: (a) treatment duration (in hours), (b) gender of children participating in the social-skills training program (percent females in sample), (c) ethnicity of children participating in the social-skills training program (percent Caucasians in sample), and (d) age of children participating in the social-skills training program (mean age in years). A range of statistical data was extracted from each

dataset based on the means and standard deviations for the two groups being contrasted.

Analyses

Two main stages of analyses were conducted: (a) effect-size adjustments were calculated, and (b) the effect-size mean and distribution were analyzed.

Effect-size adjustments. In group-contrast studies, a variable is measured on two or more groups and then compared across groups (Lipsey & Wilson, 2001). Because the dependent variable is oftentimes measured differently, it is necessary to transform the dependent variable in the different studies to a common metric before calculating the mean effect-size in a meta-analysis. In this study, the procedures suggested by Cohen (1988) were used. Effect-size statistics for group contrasts, namely, standardized mean differences, were used. These procedures involve a contrast between two groups on their respective mean scores on dependent variables that are not necessarily defined in the same way across study samples.

Analyzing the effect-size mean and distribution. Four steps were used to analyze the distribution of effect sizes using meta-analytic software (Borenstein, 2004): (a) create an independent set of effect sizes, (b) compute the standardized mean difference of outcome measures for the experimental versus control groups, (c) calculate the confidence interval for the mean, and (d) test for homogeneity of the effect-size distribution.

Before conducting the quantitative synthesis, the appropriate unit of analysis was determined. For studies that reported more than one mean effect size relevant to the hypothesis, all outcome measures (scale, self-report, sociometric, analogue assessment, observation, and scale/observation composite) were coded. Typically, multiple effect

sizes representing the same construct within a single sample are either averaged into a single mean value or one is selected from among them (Lipsey & Wilson, 2001). Due to the varying reliability and validity among raters, a multi-informant assessment is recommended to better determine how the social competence of children and youth is viewed in the social systems (e.g., schools, mental health agencies) by significant others (parents, teachers) that tend to refer these individuals for evaluation and intervention based on these measures (Foster et al., 1993). Thus, multiple raters from a single sample were averaged to produce one effect size per sample.

The definitional formula for the standardized mean difference effect-size estimates was based on the means and standard deviations for the two groups being contrasted according to

$$ES_{sm} = \frac{M_1 - M_2}{S_{pooled}} \quad (1)$$

where M_1 is the mean of the treatment group, M_2 is the mean of the control group, and s_{pooled} is the pooled standard deviation as calculated in Formula 4.

$$S_{pooled} = \sqrt{\frac{ss_1 + ss_2}{df_1 + df_2}} \quad (2)$$

where df_1 is the degrees of freedom for the treated group, df_2 is the degrees of freedom for the control group, ss_1 is the sum of squares for the treatment group, and ss_2 is the sum of squares for the control group.

The confidence interval for the mean effect size is based on the standard error of

the mean and a critical value from the z -distribution (Lipsey & Wilson, 2001). The standard error of the mean was computed as the square root of the sum of the inverse variance weights (Hedges & Olkin, 1985) as shown in the following formula:

$$SEM = \sqrt{\frac{1}{\sum \omega_i}} \quad (3)$$

where ω_i is the variance weight associated with effect size $i = 1$ to k effect sizes included in the mean.

To construct the confidence interval, the computed standard error was multiplied by a critical z -value, the product was added to the mean effect size for the upper limit and subtracted from the mean effect size for the lower limit.

Homogeneity between individual mean effect sizes and the weighted-average study mean effect-size aggregations was tested with the Q statistic to determine if pooling individual effect sizes from the studies was appropriate. The formula for Q is as follows:

$$Q = \left(\sum \omega_i ES_i^2 \right) - \frac{(\sum \omega_i ES_i)^2}{\sum \omega_i} \quad (4)$$

where ES_i is the individual effect size for $i = 1$ to k (the number of effect sizes) and ω_i as reflected in Formula 7, is the individual weight for ES_i (Hedges, 1982b).

$$\omega_i = \frac{[2(n_1 n_2)(n_1 + n_2 - 2)]}{(n_1 + n_2)[t^2 + 2(n_1 + n_2 - 2)]} \quad (5)$$

where n_1 is the sample size for the treatment group, n_2 is the sample size for the control group, and t is the obtained t value for the difference between the two groups.

Results

Research Findings

Only 23 of the 117 studies located met the criteria for this meta-analysis. The included studies produced 31 independent subsamples. The sub-sample sizes ranged from 13 to 891 children with a total sample size of 2,693 participants. Multiple outcome measures within samples were averaged to yield one effect size per sample and entered into the overall analysis. Attrition rates among the samples ranged between 0% to 31%, with most researchers noting no significant differences between attrited and non-attrited participants. Sample characteristics are summarized in Table 2. The mean age of the children per sample ranged between 5 and 15 years. One sample was classified as 55.9% female, another as 50% female, and the remaining 29 samples were classified as predominantly male. The duration for which children participated in social-skills training ranged between 8 hours and 44 hours. For 17 samples, the length of time children were in intervention was either not reported or was not reported in terms of number of hours. Fourteen samples were classified as predominantly Caucasian, 10 as predominantly minority status, and seven articles did not indicate ethnic background of participants.

Table 2

Characteristics of Independent Sub-Samples from Included Studies

Source	<i>n</i>	Age in years	% female	Treatment duration in hours	% Caucasian
August et al., (2001)	245	6.7	31.4	NR	84.1

Source	<i>n</i>	Age in years	% female	Treatment duration in hours	% Caucasian
Beyer (2000)	38	13.8	20	NR	NR
Bienert & Schneider (1995)	38	11.5	50	20	NR
CPPRG (1999)	891	6.5	31	NR	47
Dodgen (1996)	46	14.9	0	16	17.4
dos Santos-Elias et al., (2003)	39	9.5	0	36	NR
Fraser et al., (2004)	86	8.9	37.2	54	13.0
Hatzilyianis-Guarion (1993)	13	10.8	13	13.3	0
Ison (2001)	164	10	0	14.0	0
Jarden _a (1994)	35	13.5	0	18	NR
Jarden _b (1994)	34	13.5	0	NR	NR
Kamps et al., (1999)	52	8.8	9.6	NR	25
Kebles (1995)	58	11.3	17.2	NR	58.6
Kolko et al., (1990)	56	10.4	32.1	NR	NR
Lochman et al., (1993)	24	9	48	NR	0
Lochman & Wells (2002)	122	10	34	29.5	22
Metz (1997)	54	16.8	0	NR	27.8
Ogden & Halliday-Boykins (2004)	100	15.0	37	NR	95
Rahill & Teglas _i _a (2003)	43	10.6	17	17.7	65
Rahill & Teglas _i _b (2003)	49	10	14.8	17.7	65
Verduyn et al., (1990)	34	11.6	55.9	8	NR
Walker et al., (1998)	46	5	26	NR	93

Source	<i>n</i>	Age in years	% female	Treatment duration in hours	% Caucasian
Webster-Stratton & Hammond (1997) _a	49	5.8	28.9	44	87.7
Webster-Stratton & Hammond (1997) _b	48	5.5	25.5	NR	85.5
Webster-Stratton & Hammond (1997) _c	44	5.9	29.6	NR	84.1
Webster-Stratton et al., (1997) _a	56	5.9	10	NR	79
Webster-Stratton et al., (1997) _b	49	5.9	10	NR	79
Webster-Stratton et al., (1997) _c	60	5.9	10	37	79
Webster-Stratton et al., (1997) _d	49	5.9	10	NR	79
Webster-Stratton et al., (1997) _e	51	5.9	10	NR	79
Wilson (2000)	20	14.3	0	42	15

Note. See Bibliography for full citation of source. Subscript letters following publication year indicate an independent sub-sample within the study; NR = not reported.

Primary Analyses

Specifically, two questions guided this research: (a) Are social-skills training programs that incorporate a parent training component more beneficial for children and youth displaying externalizing behavior than programs not including parents as treatment agents? and (b) Are social-skills interventions that target multiple treatment agents more beneficial for children and youth displaying disruptive behavior than interventions that are limited to a single treatment agent? The first research question concerned the effect that parental involvement in social skills-training programs had on these children's mastery of social competence. Table 3 shows the standardized difference in means for social-skills programs that did not incorporate a parent component and for those that involved parents as treatment agents. Children displaying disruptive behavior who

received social-skills training without a parent component showed a posttreatment average effect size of $d = 0.20$ (95% confidence interval = 0.05 to 0.35), denoting an increase in children's social competence after they participated in social-skills training that did not involve parents as treatment agents. The combined z test for this effect was significant ($z = 2.63$, $p = .01$), indicating that children's social competence was rated as higher after they received social-skills training that did not include parent involvement.

Table 3

Treatment Efficacy for Social Skills Programs by Parent Component

Parent agent	Statistics					
	n	Standardized difference in means	Lower limit	Upper limit	z -value	p -value
No	17	0.20	0.05	0.35	2.63	0.01
Yes	14	0.24	0.15	0.34	4.96	0.001

Similarly, children with externalizing behaviors who participated in social-skills training that incorporated parents as treatment agents showed a posttreatment effect size of $d = 0.24$ (95% confidence interval = 0.15 to 0.34), indicating an increase in the children's social competence after participating in social skills intervention that involved parents as treatment agents. Again, the posttreatment change was reliably different from baseline ratings ($z = 4.96$, $p < .01$). When the 95% confidence intervals for the d values for the former group (i.e., 0.05 to 0.35) were compared with the latter (i.e., 0.15 to 0.34), there was substantial overlap. Thus, social-skills training programs that incorporated a parent-training component were not reliably more beneficial for children and youth displaying disruptive behavior than programs not including parents as treatment agents. The significance between parent versus non-parent training, however, was not directly

assessed.

To examine the second research question, social-skills interventions targeting a varying number of treatment agents for children with externalizing behavior problems were compared. Specifically, the efficacy of social-skills training with these children was compared for any combination of four possible treatment agents (i.e., clinician, parent, teacher, and peer). These analyses showed that interventions using one, two, three, and four treatment agents were all effective in improving social competence over baseline conditions, but that the differences between numbers of treatment agents were not reliable. Thus, there was no evidence that increasing the number of treatment agents had any effect on treatment outcome. In other words, interventions using multiple treatment agents were not reliably more effective than those using only one, at the 95% level of confidence.

Table 4 shows that participants who received social-skills training in one setting yielded a posttreatment effect size of $d = 0.18$ (95% confidence interval = 0.04 to 0.33) denoting an increase in these children's social competence scores after they participated in treatment with one treatment agent. The combined z test of this effect was significant ($z = 2.45$, $p = .01$), indicating that children with disruptive behavior were rated as showing reliably higher social competence after they received social-skills training in one setting. Similarly, participants who received social-skills treatment from two, three, and four different treatment agents also yielded posttreatment effect sizes indicating increases in social skill ratings after participation in training. For two treatment agents $d = 0.36$ (95% confidence interval = 0.12 to 0.60) ($z = 2.97$, $p < .01$); also, for three treatment agents $d = 0.37$ (95% confidence interval = 0.16 to 0.59) ($z = 3.37$, $p < .01$); and for four

treatment agents, $d = 0.21$ (95% confidence interval = 0.09 to 0.32) ($z = 3.45$; $p < .01$).

Table 4

Effect of Number of Treatment Agents on Social-Skills Treatment Efficacy

Number of agents		Statistics				
	n	Standardized difference in means	Lower limit	Upper limit	z -value	p -value
1	16	0.18	0.04	0.33	2.45	0.01
2	5	0.36	0.12	0.60	2.97	0.001
3	5	0.37	0.16	0.59	3.37	0.001
4	5	0.21	0.09	0.32	3.45	0.001

Secondary Analyses

A fixed-effects model was used to assess heterogeneity of effect sizes. Given the significant degree of heterogeneity of variance among the 31 subsamples ($Q = 49.30$, $p < .05$; $df = 30$), several secondary analyses were conducted to assess the effect that length of treatment, sample characteristics, and type of outcome measure used had on the overall results. For dichotomized sample characteristics reported as percentages (i.e., gender, ethnicity), the standardized mean difference was approximated by differencing the arcsine transformed proportions (Lipsey & Wilson, 2001).

Length of treatment. The effect-size variance was partitioned for the duration for which children participated in social-skills training. To test whether length of treatment, measured as the number of hours in training, was related to the variability in observed effect sizes, a weighted regression analysis was conducted. No regression coefficients were significantly different from zero ($Q = 2.37$, $p = 0.12$; $df = 13$). Thus, there was no relationship between duration for which children participated in the social-skills program and treatment efficacy.

Sample characteristics. The effect-size variance was also partitioned for sample characteristics. A standard multiple regression analysis was conducted between social competence levels as the dependent variable and age, gender, and ethnicity of participants as independent variables. Analysis was performed using SPSS REGRESSION and SPSS FREQUENCIES for evaluation of assumptions.

Results of evaluation of assumptions led to transformation of the variables to reduce the number of outliers. With the use of a $p < .001$ criterion for Mahalanobis distance, three effect sizes having a strong influence on the mean, one outlier and two extreme scores, were omitted. No major deviations from normality, linearity, or homoscedasticity were apparent. Results showed that age ($r = -0.25$), gender ($r = 0.13$) and ethnicity ($r = 0.21$) of participants correlated poorly with social competence levels, and that the multiple R of .26 was not reliably different from zero ($p > .05$).

Outcome measure. The effect-size variance was partitioned for the type of outcome measure used to collect pre- and post-treatment social competency levels. Table 5 shows that analogue ($d = 0.32$; confidence interval = 0.22 to 0.42), observation ($d = 0.33$; confidence interval = 0.21 to 0.45), and sociometric ($d = 0.35$; confidence interval = 0.26 to 0.45) measures revealed increases in participants' social competence after social-skills training. The combined z tests of these effects were significant (z 's = 6.42, 5.42, and 7.36, respectively, $p < .01$ in all cases) indicating that when these types of outcome measures were used to assess change, children with disruptive behavior were rated as displaying higher social competence posttreatment relative to baseline. In contrast, rating scales did not show increases in participants' social competence after social skills training regardless of rater (i.e., parent, student, or teacher).

Table 5

Effect of Type of Outcome on Social-Skills Treatment Efficacy

Type of Outcome	Statistics					
	<i>n</i>	Standardized difference in means	Lower limit	Upper limit	<i>z</i> -value	<i>p</i> -value
Analogue	19	0.32	0.22	0.42	6.42	0.001
Observation	6	0.33	0.21	0.45	5.42	0.001
Scale-Parent	5	-0.07	-0.20	0.06	-1.02	0.31
Scale-Student	5	0.06	-0.28	0.41	0.36	0.72
Scale-Teacher	15	0.08	-0.02	0.19	1.52	0.13
Sociometric	7	0.35	0.26	0.45	7.36	0.001

Note. See Appendix B for description of available measures.

Rater. Finally, the effect size variance was partitioned for the type of rater on social-skills treatment efficacy. Table 6 shows that participants' self-ratings ($d = 0.19$; confidence interval = 0.07 to 0.30) showed that they perceived reliable increases in their social competence posttreatment (3.23, $p < .01$). Teachers ($d = 0.21$; confidence interval = 0.11 to 0.30), clinicians ($d = 0.33$; confidence interval = 0.22 to 0.45), and peers ($d = 0.35$; confidence interval = 0.25 to 0.44) also rated increases in social competence after social-skills training (z 's = 4.39, 5.87, and 7.21, respectively, $p < .01$ in all cases). In contrast, parents did not rate significant increases in their child's social competence after social-skills training.

Table 6

Effect of Type of Rater on Social-Skills Treatment Efficacy

Type of rater	Statistics					
	<i>n</i>	Standardized difference in means	Lower limit	Upper limit	<i>z</i> -value	<i>p</i> -value
Student	10	0.19	0.07	0.30	3.23	0.001
Teacher	27	0.21	0.11	0.30	4.39	0.001

Type of rater		Statistics				
Clinician	9	0.33	0.22	0.45	5.87	0.001
Peers	6	0.35	0.25	0.44	7.21	0.001
Parent	7	0.05	-0.07	0.17	0.85	0.39

Treatment integrity. Most (91%) of the samples included in the analysis reported observation of treatment integrity. Researchers indicated different methods to ensure appropriate implementation of the social-skills training program. Various authors indicated that, to ensure that the treatment was implemented with integrity, staff received extensive training, a treatment manual was followed, staff members were closely monitored and sometimes observed through a one-way mirror, logs were kept of each training session, staff used checklists to ensure standardization, videotapes of sessions were reviewed and the staff received feedback, and videotapes of sessions were randomly checked for integrity.

Discussion

Post-Treatment Social Competence Levels

This meta-analytic review revealed increases in participants' social competence levels post-treatment for social-skills programs not incorporating a parent agent and for those incorporating a parent component. Using parents as treatment agents, however, was not shown to be reliably more beneficial for these children than programs that did not incorporate a parent component. Still, parent involvement in intervention resulted in an increase in their children's social competence.

Although development of antisocial behavior has a variety of influences, the immediate context in which development of antisocial behavior occurs is viewed as an area of importance (Wicks-Nelson & Israel, 2003). Relationship factors such as parent-

child interactions are posited to influence noncompliance. For example, parental involvement, supervision, and discipline are related to conduct problems. Parents of children displaying disruptive behavior have been found to issue more commands, questions, and criticisms. Moreover, commands issued are typically presented in an ineffective, an angry, a humiliating, or a nagging manner. Additionally, consequences that parents deliver affect the child's noncompliant behavior.

Parent training typically focuses on child-management skills that include effective discipline strategies that incorporate contingencies, follow through, developmentally reasonable expectations, appropriate child supervision, positive reinforcement, and modeling and teaching effective problem-solving skills (Dishion et al., 1996; Kazdin, 1997). Also, parents are taught to identify problems, to observe and record behavior, to use social and nonsocial reinforcers effectively for appropriate pro-social behavior, and to withdraw reinforcers effectively for undesirable behavior (Patterson et al., 1992). Although inclusion of a parent component did not offer reliable increases in children's social competence beyond that of programs not including parents as treatment agents, children receiving intervention that included parents showed reliable benefits compared to baseline ratings. Therefore, a parent agent remains an important component to intervention.

These data do not provide support for the assertions of researchers (Bear et al., 2000) that effective interventions for children with emotional and behavior disorders should include a comprehensive intervention, training diversely across persons common to the natural setting. In particular, social-skills interventions targeting one, two, three, and four treatment agents were all effective in improving participants' social competence.

There was no evidence, however, that increasing the number of people administering training had any effect on the treatment outcome. An increasing number of treatment agents within programs, however, consisted of any combination of four treatment agents including clinicians, teachers, parents, and peers. Given the research support for a systems-based approach to intervention with these children and youth (Wicks-Nelson & Israel, 2003), it is possible that particular combinations are more effective than others rather than assuming that one treatment agent is as effective as an increasing number .

Given the lack of support for the additional training benefits of incorporating parents as treatment agents and for increasing the number of treatment agents in general with this population, it is interesting to consider the taxonomic theory of antisocial behavior that proposes two primary prototypes: early-onset, chronic-persistent antisocial behavior versus adolescent-limited antisocial behavior (Moffitt, 2006). Life-course-persistent antisocial behavior originates early in life whereas adolescent-limited antisocial behavior emerges during puberty. Moreover, in the life-course-persistent development type, antisocial behavior is posited to persist across the life course. In contrast, in the adolescent-limited type, the behavior desists in young adulthood. The issue of pathways of antisocial behavior has not been addressed in the literature. Therefore, it would be interesting to understand how the two groups react differently to opportunities such as social-skills training.

Although research (Bear et al., 2000; Walker et al., 1995) suggests that treatment with children displaying externalizing behavior should be intensive and sustained over time, the present study did not show significant improvement in participants' social competence as social-skills treatment length increased. It is interesting to speculate on

possible reasons why the social competence levels of children completing longer treatment programs were not better than those participating in shorter programs in this study. One possibility is that most authors did not report treatment length or did not report duration of the program in number of hours. Specifically, only 14 of the 31 samples, or less than half, were included in the analysis possibly influencing the result. Because sample size is one variable affecting the power of an analysis, the small sample size noted here may have reduced the power and made it very difficult to achieve reliable differences at even the .05 level. Additionally, the intensity of training may account for the results. Given that the average amount of social-skill training was 26 hours, there is the possibility that longer interventions are needed to produce results. Because the average participant was in the fifth grade, it is not unreasonable to assume that social-skill deficits were relatively longstanding and that treatment over a period of years is necessary to ameliorate the social problems.

Prior meta-analytic reviews (Denham & Almeida, 1987; Schneider 1992; Whipple, 2006) have yielded mixed results on the efficacy of social-skills training and treatment length. A quantitative review (Denham & Almeida, 1987) found larger treatment effects for longer-duration social-skills training compared to shorter-duration training. Another analysis (Schneider, 1992), however, found no relationship between overall social-skills training treatment efficacy and treatment length. Whipple (2006) found that duration of social-skills training did not contribute to the prediction of post-treatment aggression levels. Given the research support for sustained intervention with this population in the general treatment literature (Bear et al., 2000) and the small sample size and generally short programs included in the present analysis of treatment length,

caution should be used in discounting this factor when designing social-skills programs.

Although in the present study sample characteristics were generally poorly correlated with the variance in social competence levels, past research has shown that composition of samples with regard to factors such as age, gender, and ethnicity have predicted treatment outcomes. For example, researchers (Bear et al, 2000; Walker et al., 1995) suggest that clinicians should be cognizant of the importance of early intervention when disruptive behavior first appears. Kazdin (1995) affirmed that treatment for early-onset disruptive behavior is most successful with children eight years of age and younger. Indeed, Moffitt et al. (2002) asserted that adolescents with early-onset disruptive behavior have a particularly poor prognosis, even after treatment. The present findings, however, indicated that age did not significantly predict social competence outcomes.

Prior meta-analytic reviews (Beelmann et al., 1994; Denham & Almeida, 1987; Losel & Beelmann, 2003; Schneider, 1992; Schneider & Byrne, 1985; Whipple, 2006) on the efficacy of social-skills training and age of participants have yielded mixed results. Denham and Almeida (1987) found stronger social-skills training benefits for younger children in a sample of children 3 to 12 years old. Other researchers (Beelmann et al., 1994), in contrast, have found higher social-skills training treatment efficacy in older children in a sample of children 6 to 15 years. Losel and Beelmann (2003) and Schneider and Byrne (1985), on the other hand, found lower treatment benefits for elementary-aged children versus those who were pre-school age and adolescents. Finally, Schneider (1992) and Whipple (2006) found that participants' age in general was poorly related to post-treatment outcomes. Given that treatment literature in general with children and youth displaying disruptive behavior suggests intervening when problematic behavior

first appears (Bear et al., 2000) and some social-skills training literature (Denham & Almeida, 1987) supports this contention, attempts should be made to address disruptive behavior in the formative years to help divert antisocial children from a pattern of destructive outcomes as the study of the effects of age on social-skills training is ongoing.

Although a prior meta-analytic review (Sukhodolsky et al., 2004) showed that samples comprising of both male and female participants yielded greater social-skills treatment effects than samples that included only males, in the present study, gender of participants did not significantly predict social competence levels. A possible explanation for this result is that samples were predominantly male. In fact, only one sample was predominantly female and another was 50% female. Therefore, it may have been difficult to detect the effects of gender on social-skills training efficacy, if indeed they were present.

In the present study, the percentage of participants in the samples that were classified as Caucasian did not predict social competence levels. Specifically, as the percentage of Caucasians in the samples increased, treatment benefits did not reliably increase. A prior meta-analytic review (Whipple, 2006) found that the percentage of participants in the samples that were classified as Caucasian predicted 60% of the variance in aggression levels. In particular, as the percentage of Caucasians in the sample increased, the aggression levels decreased post-treatment. In the present study, however, there were twice as many samples that were predominantly Caucasian than minority. Therefore, it may have been difficult to detect ethnic differences in treatment response if they were indeed present.

Focus on appropriateness of interventions is regarded as key in effective

interventions for children with antisocial behavior (Bear et al., 2000). The effect of ethnicity on social-skills training has not generally been addressed in the literature. J. M. Coleman (1978) and J. W. Coleman (1978), however, suggest that cultural background should be considered when working with children and youth. Indeed, sociocultural considerations have been found to be important in the development of instructional programs (Tharp, 1989). For example, Tharp (1989) found that by considering the sociocultural needs and abilities of Hawaiian children who were at high risk for reading failure, the reading program could be adapted to the children's culture. The teaching-learning interactions characteristic of the Hawaiian culture were incorporated into the reading instruction. Results showed an improvement in their reading performance. In addition, further inferences were drawn that a sociocultural approach is fundamental in other areas of instruction, including social-skills training, especially with minority students.

A review of the social-skills training literature (Bos & Fletcher, 1997; Garcia & Malkin, 1993) with African American students with emotional behavior disorder suggests that trainer characteristics also play an important role in social competence promotion because the clinician sets and influences the instruction for individuals displaying disruptive behavior. For example, a trainer's cultural self-awareness is directly related to the identification of cultural influences that impact social-skills programs. The reporting of information in the present analysis regarding trainers was limited. Indeed, only one study reported information about the ethnic background of the trainers. The CPPRG (1999) reported that intervention staff was hired from local communities to match the ethnic composition of the high-risk children as closely as possible.

Perhaps uneven small sample sizes for minorities and Caucasians in the present study made it difficult to detect differences in participants' response to intervention if differences were indeed present. Although ethnic background of participants was not predictive of treatment outcome in the present study, consideration of the cultural relevance of interventions is recommended; for, research shows that being a minority is a risk factor for development of antisocial behavior (Lipsey & Derzon, 1998).

Certain types of outcome measures used to collect pre- and post-treatment social competence levels were found to affect findings. For example, analogue, observation and sociometric measures revealed reliable increases in participants' posttreatment social competence. Although analogue techniques have shown little correspondence with social validity or predictive ability of social outcomes (Beelman et al., 1994; Denham & Almeida, 1987; Gresham 1983, 1986), these overall findings are encouraging given that observation techniques have been found to predict standings on socially valid measures (Gresham 1983) and sociometric outcome measures are considered to be socially valid (Gresham, 1983; Gresham, 2002).

Behavior rating scales, however, did not yield significant findings even when the rater was considered. Specifically, parents, student participants, and teachers did not perceive significant improvement in social competence after social-skills training when rating scales were used. This finding is consistent with prior research indicating that these scales may not be particularly sensitive in detecting short-term treatment effects (Sechrest et al., 1996).

Surprisingly, the type of informant did not predict perceived social-skills treatment benefits and, in fact, were contrary to the findings of previous research (Coie et

al., 1991; Malik & Furman, 1993; Patterson et al., 1990). Coie and colleagues (1991) suggested that teacher reports of aggressive behaviors are usually quite valid. Parent ratings, on the other hand, are posited to underestimate social difficulties experienced by their children (Malik & Furman, 1993). In the present study, however, although teachers perceived an increase in students' social competence after social-skills training, parents did not rate their children as improving in this area post-treatment.

Additionally, student self-ratings are reportedly oftentimes not valid, frequently overestimating social skills and not mirroring ratings given by either teachers or peers (Patterson et al., 1990). Although the present analysis showed that student participants, clinicians and peers perceived an increase in social competence after treatment, the effects for the clinicians and peers were larger than that of student participants. The differences among these effects, however, were not assessed.

Although rating scales are considered to be inherently socially valid, they have been criticized on the basis that they are not particularly sensitive in detecting short-term treatment effects (Sechrest et al., 1996). Sechrest et al. argued for applying the method of just noticeable difference to gauge treatment outcomes. In applying this method to social-skills training, the question is: How much of a difference in social behavior is required for it to be noticed by peers, parents, teachers and clinicians in the child's environment? Oftentimes, very large and consistent changes in social behavior over a long period of time are required for them to be noticed by significant others in the child's environment (Sechrest et al., 1996). For example, very large and extended increases in prosocial behavior with peers may be necessary before these changes are reflected in sociometric measures. Therefore, type of measure may have influenced results noted here.

Study Limitations

Some limitations of the present study results should be addressed. Despite careful searching, other studies may have been overlooked. In particular, literature searches were conducted exclusively on the University of Rhode Island computerized data bases, possibly omitting articles available through other library consortiums. In addition, many located studies were omitted due to insufficient data reporting. For example, many studies did not include a control group, did not provide outcomes for social competency measures, or were in a language other than English. Thus, it is possible that exclusion of these studies influenced the findings noted here. Although there was substantial overlap when the confidence intervals for the d values for participants receiving training without a parent component were compared with programs incorporating parents as treatment agents, the parent versus non-parent programs were not directly assessed. The present findings based number of treatment settings on any combination of treatment agents including clinicians, teachers, parents, and peers, not particular combinations, making it difficult to discern the most beneficial treatment agents. Also, the samples were predominantly male, so the validity of the findings for females is unknown. Additionally, the training programs were relatively short, possibly accounting for lack of treatment efficacy. Finally, because sample size is one variable affecting the power of an analysis, the small sample size noted here may have reduced the power and made it very difficult to detect reliable differences at even the .05 level.

Future Research Directions

Future research on the influence of the number of treatment agents on social-skill treatment efficacy with children displaying disruptive behavior such as the analysis done

in the present study is needed to investigate a couple of factors: (a) Which treatment agent contributed to its effectiveness? For example, do children trained by peers tend to do better than others? and (b) What combination of treatment agents produces better treatment outcomes? For example, does a combination of parents and peers tend to positively affect children's performance of social skills more than clinicians and teachers paired as treatment agents?

Future research should examine the effect of specific treatment outcome measures rather than utilizing broad classifications such as behavior rating scales and sociometric outcome measures as was done in the present study. As shown in Appendix B, the rating-scales classification included behavior reports such as the Social Skills Rating System and the Child Behavior Checklist, and sociometric measures included social acceptance and peer nominations subsumed within this category. Thus, examination of the role that particular outcome measures have on treatment efficacy is warranted.

Further research should be directed at replication of the present study focusing on participant and treatment characteristics. For example, research should focus on using a larger sample of female participants in order to explore and understand their response to social-skills training more thoroughly. Moreover, a comparison of predominantly Caucasian and predominantly minority samples with a larger number of samples would be useful in delineating universal as well as culture-specific components in social-skills training programs including, but not limited to, consideration of participants' socio-cultural needs and abilities as well as treatment agent characteristics such as the trainers' cultural self-awareness.

Summary and Conclusions.

In the current study, social-skills interventions that incorporated a parent training component were compared to social-skills interventions not including parents as treatment agents for children and youth displaying disruptive behavior. Additionally, the differential effects of the number of training agents (clinicians, teachers, parents, peers) from which the target children received treatment were assessed. Results indicated that social-skills programs that incorporated parents as treatment agents were not reliably more beneficial than programs not including a parent component. Although social-skills training incorporating various combinations of treatment agents were all effective in improving participants' social competence, there was no evidence that increasing the number of treatment agents had any effect on treatment outcome.

Secondary analyses were conducted to assess the effect that length of treatment, sample characteristics, and type of outcome measure used had on the overall results. Results indicated that there was no relationship between duration for which children and youth participated in social-skills training and treatment efficacy. Moreover, age, gender, and ethnic background of participants did not predict post-treatment social-competence levels.

The type of outcome measure used to collect pre- and post-treatment social competency levels influenced results. Specifically, analogue, observation, and sociometric measures revealed reliable increases in participants' social competence after social-skills training. In contrast, rating scales did not show reliable increases in children and youths' social competence after social-skills training regardless of rater (i.e., parent, self, teacher). The overall influence of type of rater when all outcome measures were

considered, however, showed that participant self-ratings, teachers, clinicians, and peers revealed reliable differences in posttreatment social-competence levels.

Given the positive results from social-skills programs including parents as treatment agents and extant literature showing the benefits of inclusion of parents in treatment for children and youth displaying disruptive behavior, these findings underscore the importance of considering parents as treatment agents if it is not too time-consuming or costly for this option. Although, there was no evidence that increasing the number of treatment agents had any effect on treatment outcome, the treatment agents within programs consisted of any combination of four treatment agents including clinicians, teachers, parents, and peers. Given the research support for a systems-based approach to intervention with this population, it is possible that particular combinations of treatment agents are more effective than others; thus, one must not assume that one treatment agent is as effective as an increasing number in the absence of knowledge about the influence of various combinations of interventionists. Although this study did not provide evidence relating treatment length and children's ages to social-skills treatment efficacy, extant treatment research suggests that longer-length training and addressing disruptive behavior when it first appears is recommended; given the low sample sizes in the present study in analyzing these factors and unclear findings in social-skills treatment literature, caution should be used in discounting these factors until further research is conducted.

Appendix A

Breakdown of Specific Data Extracted from Included Studies

Study	<i>d</i>	Type agent	Outcome measure	Rater	Assignment to groups	Nature control
August et al., (2001)	0.19	C, T, P, p	Scale	T, P	Non-random	No treatment
Beyer (2000)	0.19 -0.28	C	Scale-S Scale-T	S, T	Random	Routine
Bienert & Schneider (1995)	0.06 0.26	C	Sociometric Self-report	P, S	Random	Wait-list
CPPRG (1999)	0.17 0.20 -0.09 -0.04 0.17 0.60	C, T, P, p	Analogue Observation Scale-T Scale-P Sociometric Sociometric	C, T, P, p, S	Random	No treatment
Dodgen (1996)	0.70 0.35	C	Scale-T Analogue	T, S	Random	Wait-list
Elias et al., (2003)	1.53	C, P	Analogue	S	Random	Routine
Fraser et al., (2004)	0.32	C, P, p	Scale-T	T	Random	Wait-list
Hatzilyianis-Guarton (1993)	-1.84 1.20 -0.51 -0.09	C	Scale-P Scale-T Scale-S Sociometric	T, P, p, S	Random	Wait-list
Ison (2001)	0.07	T	Scale-T	T	Random	No treatment
Jarden _a (1994)	0.50	T	Analogue	T	Random	Wait-list
Jarden _b (1994)	0.08	C, T	Analogue	C	Random	Wait-list
Kamps et al., (1999)	0.57	T, p	Observation	C	Non-random	Wait-list

Study	<i>d</i>	Type agent	Outcome measure	Rater	Assignment to groups	Nature control
	0.53		Scale-T			
Kebles (1995)	-0.12 0.04 0.00	C	Scale-P Scale-S Scale-T	T, P, S	Non-random	Routine
Kolko et al., (1990)	2.84 0.50 0.43 -0.43 0.60	C, T, staff	Self-report Scale Sociometric Sociometric Analogue	C, p	Matched	Routine
Lochman et al., (1993)	0.91	C	Sociometric	p	Random	Routine
Lochman & Wells (2002)	-0.13 0.28 -0.07	C, P	Self-report Scale-T Scale-T	T, S	Random	No treatment
Metz (1997)	0.03	C	Analogue	C	Non-random	No treatment
Ogden & Halliday-Boykins (2004)	0.41	C, P, p	Scale composite	T, P, S	Random	Routine
Rahill & Teglas ^a (2003)	-0.22	C	Scale-T	T	Non-random	Non-specific
Rahill & Teglas ^b (2003)	-0.24	C	Scale-T	T	Non-random	Non-specific
Verduyn et al., (1990) Walker et al., (1998)	0.90 1.17 0.97	C C, T, P, p	Self-report Scale-T Observation	S C, T	Random Random	No treatment Wait-list
Webster-Stratton & Hammond ^a (1997)	0.79 0.41 0.82 0.81 0.91	C	Analogue Analogue Analogue Analogue Observation	T, P	Random	Wait-list
Webster-Stratton & Hammond ^b (1997)	0.30	P	Analogue	T, P	Random	Wait-list

Study	<i>d</i>	Type agent	Outcome measure	Rater	Assignment to groups	Nature control
	0.31		Analogue			
	0.19		Analogue			
	0.21		Analogue			
	0.98		Observation			
Webster-Stratton _c (1997)	0.99	C, P	Analogue	T, P	Random	Wait-list
	0.26		Analogue			
	0.54		Analogue			
	0.48		Analogue			
	0.87		Observation			
Webster-Stratton et al. _{,a} (1997)	0.01	P	Composite	C, T, p	Random	Wait-list
Webster-Stratton et al. _{,b} (1997)	0.07	T, P, p	Composite	C, T, p	Random	Wait-list
Webster-Stratton et al. _{,c} (1997)	0.35	C, T, P	Composite	C, T, p	Random	Wait-list
Webster-Stratton et al. _{,d} (1997)	-0.03	C, T, P, p	Composite	C, T, p	Random	Wait-list
Webster-Stratton et al. _{,e} (1997)	0.42	C, T, P, p	Composite	C, T, p	Random	Wait-list
Wilson (2000)	-0.67	T	Scale-P	T, P, S	Non-random	No treatment
	0.20		Scale-S			
	1.47		Scale-T			

Note. C = clinician, T = teacher, P = parent and p = peers.

Appendix B

Description of Outcome Measures

Outcome Measure	Description
<i>Rating Scales</i>	
<i>BASC composite</i>	Three scales from the teacher and parent Behavioral Assessment System for Children were used as an index of social competence: Social skills, leadership, and adaptability.
<i>SSRS—S</i>	Social Skills Rating System—Student version
<i>SSRS—T</i>	Social Skills Rating System—Teacher version
<i>SHP—T</i>	Social Health Profile to assess prosocial behavior and emotion regulation (e.g., friendly, helpful, resolves peer problems and controls temper in a disagreement)
<i>SCS—P</i>	Social Competence Scale—Parent form
<i>ECBI</i>	Eyberg Child Behavior Inventory with six additional prosocial items added by the author to allow for the assessment of appropriate, prosocial behaviors.
<i>CIPT</i>	Children’s Interpersonal Problem-solving Test
<i>SSRS—P</i>	Social Skills Rating System—Parent form
<i>CBR—T</i>	Child Behavior Report—Teacher; acceptance of child by peers scale
<i>Survey</i>	Teachers’ ratings of students’ behaviors were collected using a survey developed by the experimenters, with items selected to reflect class participation and peer interaction behaviors.
<i>SPS</i>	Social Problems Screen
<i>TRCSS</i>	Teacher Rating of Children’s Social Skills to rate children’s improvement on seven items, indicating children’s ability to take turns, act cooperatively, initiate interactions, and handle disagreements.
<i>SPS—T</i>	Teachers rated children’s improvement in problem-solving and anger management skills.
<i>CBCL composite</i>	Child Behavior Checklist combined for caregiver, youth, and teacher reports of

Outcome Measure	Description
	social competence.
<i>SSBS—T</i>	School Social Behavior Scale--Teacher to assess social competence
<i>TRAB</i>	Teacher Ratings of Adaptive Behavior
<i>Sociometric</i>	
<i>PRLS</i>	Peer Rating of Likeability Scale
<i>Social preference</i>	Children were asked to nominate (unlimited) classmates whom they “most liked” and “least liked.” Social preference scores were computed by standardizing the nominations within classrooms and by calculating the difference between these standard scores (most liked – least liked). Resulting score was restandardized.
<i>Peer nomination</i>	Peer nominations were collected for the behavioral item “Some kids are really good to have in your class because they cooperate, help others, and share. They let other kids have a turn.”
<i>PD</i>	Peer ratings of Playmate Desirability
<i>SR—Like</i>	Sociometric Ratings—Like, two summary scores representing how well the child was liked.
<i>PN—Like</i>	Peer Nomination—Like for which children in the study were asked to nominate up to (any) three peers whom they got along well with and liked.
<i>SA</i>	Social Acceptance which averaged grade mates’ ratings on a scale ranging from 1 (children you like the least) to 5 (children you like most).
<i>Self-Report</i>	
<i>PCSC</i>	Perceived Self-Competence Scale
<i>CAI—M</i>	Children’s Assertiveness Inventory—Modified to assess the individual’s endorsement of 14 individual social skills.
<i>Social Diary</i>	Weekly diary of social activities
<i>Analogue</i>	
<i>SPS</i>	Social Problem-Solving measure
<i>API</i>	Adolescent Problem Inventory to assess how youths respond to various problem

Outcome Measure	Description
	situations.
<i>MEPS</i>	Means-Ends Problem-Solving Procedure to measure an individual's interpersonal problem-solving ability and skills.
<i>BR</i>	Behavioral Role-play to assess social competence
<i>SPST-R</i>	Social Problem-Solving Test—Revised
<i>Observation</i>	
<i>MOOSES</i>	The Multiple Option Observation System for Experimental Studies
<i>CCC—T Form</i>	Carolina Child Checklist—Teacher Form to assess prosocial behavior.
<i>SSBD</i>	Systematic Screening for Behavior Disorders social engagement interval recording instrument
<i>API</i>	Adolescent Problem Inventory
<i>AET</i>	Academic Engaged Time observations including: (a) attending to the teacher, (b) making appropriate motor responses (e.g., following directions), (c) asking for assistance in an appropriate manner, (d) cooperating with others, and (e) being appropriately involved in teacher-assigned tasks and activities.
<i>PDR</i>	Parent Daily Report of total target positive behaviors
<i>Composite</i>	
<i>Composite</i>	The composite score includes the Teacher Assessment of School Behavior (prosocial), Teacher Rating Scales of Perceived Competence Scale for Young Children (social acceptance), the Social Health Profile (SHP), and the Dyadic Parent-Child Interactive Coding System (positive communication).

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