

Evaluating the Long-Term Impact of Youth Interventions on Antisocial Behavior:
An Integrative Review and Analysis

A Dissertation Presented to
The Faculty of the Graduate School
University of Missouri

In Partial Fulfillment
of the Requirements for the Degree
Doctor of Philosophy

by
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JUN[2012

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EVALUATING THE LONG-TERM IMPACT OF YOUTH INTERVENTIONS ON
ANTISOCIAL BEHAVIOR: AN INTEGRATIVE REVIEW AND ANALYSIS

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ACKNOWLEDGEMENTS

I would like to thank Charles Borduin for his tireless efforts in mentoring, teaching, supervising, and supporting me in developing my career as a psychologist. In addition, I would like to thank Kristin Hawley, Ann Bettencourt, Wendy Reinke, and Mark Manning, who provided valuable advice regarding this study. I am indebted to Jill Antrobus and Matthew Jones, who assisted me in collecting data. Lastly, I would like to thank my family for supporting me through more than two decades of educational endeavors.

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ABSTRACT

Youth antisocial behavior exacts a tremendous toll on society and often persists into adulthood. Although researchers have identified a number of interventions that prevent or reduce youth antisocial behavior in the short term, only recently has evidence of long-term intervention effects become available. In addition, historical divisions between prevention and therapy have impeded cooperation among researchers and intervention providers alike, thereby limiting progress in addressing an important social concern. The present study used meta-analysis to (1) summarize evidence that youth interventions influence long-term patterns of antisocial behavior, (2) identify factors that moderate long-term outcomes of interventions, and (3) facilitate integration of findings across prevention and therapy outcome studies. Results from 66 intervention trials (i.e., 34 prevention trials, 32 therapy trials) indicated that many interventions delivered during childhood and adolescence can produce lasting reductions in antisocial behavior (mean $d = .31$, 95% confidence interval = .23 - .39) relative to control conditions. In addition, moderator analyses revealed specific characteristics of participants, interventions, and study methods that influenced the size of those reductions. The results of this meta-analysis have important implications for selecting effective interventions to address antisocial behavior during childhood and adolescence. Moreover, the findings imply that youth service systems (e.g., education, mental health, juvenile justice, child welfare) would likely benefit from increased integration of prevention and therapy practices.

Evaluating the Long-Term Impact of Youth Interventions on Antisocial Behavior: An Integrative Review and Analysis

Antisocial behavior is the most common and costliest of all youth mental health problems (Cohen, 1998; Welsh et al., 2008) and follows a severe, persistent course for 5 to 10 percent of youths (Laub & Sampson, 2001; Moffitt, 1993). The research literature suggests that many interventions can effectively reduce youths' likelihood of engaging in antisocial behavior both while interventions are occurring and up to a few months after interventions have ended (Durlak & Wells, 1998; Greenberg, Domitrovich, & Bumbarger, 2001; Weisz, Jensen-Doss, & Hawley, 2005; Weisz, Weiss, Han, Granger, & Morton, 1995; Wilson & Lipsey, 2007). However, evidence that interventions affect long-term patterns of antisocial behavior has only recently become available and remains fragmented within the research literature, making it difficult to discern patterns among interventions with evidence of long-term effects. This fragmentation may partially explain why the majority of professional organizations and government agencies that set standards for intervention effectiveness do not yet require evidence of lasting effects (e.g., Center for the Study and Prevention of Violence, 2012; Office of Juvenile Justice and Delinquency Prevention, 2012; Society for Clinical Child and Adolescent Psychology, 2012; Substance Abuse and Mental Health Services Administration, 2012). The present study seeks to compile evidence of long-term effects of youth interventions on antisocial behavior so that intervention providers and policymakers can better select and implement practices likely to produce lasting benefits.

In addition to the relative recency of research on long-term effects of interventions, historical divisions between prevention and therapy have contributed to

poor integration of intervention outcomes within the research literature. Prevention-therapy divisions have been reinforced repeatedly in published reviews and government reports that focus on *either* preventive interventions (e.g., Durlak & Wells, 1997, 1998; Greenberg et al., 2001; Mrazek & Haggerty, 1994; O'Connell, Boat, & Warner, 2009) *or* therapeutic interventions (e.g., Weisz et al., 1995, 2005, 2006). Such divisions inhibit recognition of the shared goals of prevention and therapy (i.e., to facilitate healthy psychosocial development and reduce problem outcomes) and consequently impede continuity of intervention strategies across children of different ages and levels of problem severity. The present study therefore seeks to bridge the prevention-therapy divide by conceptualizing prevention and therapy as different types of services within the broader category of youth interventions.

In the current study, I use meta-analysis to highlight youth interventions with evidence of long-term effectiveness in reducing antisocial behavior by (1) statistically summarizing the results of research trials that have evaluated the long-term effects of interventions on antisocial behavior outcomes, (2) identifying moderators of those long-term effects, and (3) compiling prevention and therapy trials in a single study to facilitate integration of research findings across service sectors. Ideally, this review will help to promote interventions that show evidence of sustained effects, thereby contributing to increased usage of effective intervention practices in community settings and reduced costs for taxpayers (Foster, Jones, and the Conduct Problems Prevention Research Group, 2006).

Conceptualizing Prevention vs. Therapy

Historically, social scientists have distinguished between *prevention*, which

includes interventions delivered before “clinically significant” problems arise, and *therapy* (often called treatment), which includes interventions delivered after such problems are evident (Mrazek & Haggerty, 1994; O’Connell et al., 2009). In therapy research trials, clinical significance is most often defined by a cut-off score on a standardized measure (e.g., Child Behavior Checklist; Achenbach, 1991) or by a formal diagnosis based on a diagnostic system (e.g., *Diagnostic and Statistical Manual of Mental Disorders, 4th Edition – Text Revision*; American Psychiatric Association, 2000). For antisocial behavior, clinical significance may also be defined by evidence of criminal activity (e.g., one or more arrests) or involvement in the juvenile justice system.

The historical backgrounds of prevention and therapy provide several reasons why the divide between these types of intervention continues to be reinforced in both research and practice. Modern preventive approaches for addressing youth psychosocial problems arose out of broader efforts to address common public health problems and to promote positive youth development (Gordon, 1983; Greenberg et al., 2001). Consequently, this set of approaches includes interventions that seek to both reduce the likelihood of negative psychosocial outcomes and to increase the likelihood of positive psychosocial outcomes over the course of development (e.g., Catalano, Berglund, Ryan, Lonczak, & Hawkins, 2004). Preventive interventions typically target larger units (e.g., schools, communities, neighborhoods) than do therapeutic interventions, although some prevention programs target smaller, more specific groups of high-risk youths (e.g., children exposed to domestic violence). Accordingly, prevention researchers distinguish between broad interventions that are delivered to all youths (i.e., primary prevention) and interventions that are delivered only to those youths with elevated levels of risk or

moderate levels of existing problems (i.e., secondary prevention). Interventions that are delivered to individuals who have already developed significant problems (i.e., tertiary prevention), however, are rarely considered by researchers alongside primary and secondary interventions, as evidenced by the exclusion of tertiary preventive interventions in several key reviews over the past few decades (e.g., Durlak & Wells, 1997, 1998; Mrazek & Haggerty, 1994; Greenberg et al., 2001).

An alternative classification system for preventive interventions also reinforces the exclusion of more severe problem behaviors (see Mrazek & Haggerty, 1994). Three levels are employed in this widely used system: (1) universal interventions, which, like primary prevention, target whole populations and often multiple behaviors; (2) selected interventions, which target individuals who are not yet exhibiting significant problems but who are members of at-risk groups (e.g., low-income youths, children of substance-dependant parents); and (3) indicated interventions, which target youths exhibiting mild to moderate problem behaviors (e.g., youths identified by teachers as disruptive or aggressive). Note that the selected and indicated levels of intervention can be viewed as subcategories within the broader category of secondary preventive interventions.

Although researchers using either intervention classification system exclude youths with severe problems from prevention trials, these researchers clearly acknowledge the role of risk factors and problem severity by tailoring intervention methods to fit youths' varying needs. Examples of preventive intervention methods include early childhood education for children from low-income families, classroom behavior management curricula for teachers, parenting courses for young mothers, and mentoring programs for youths from single-parent homes. These interventions hold in

common the premises that serious youth problems can be prevented by (a) reducing the impact of individual and environmental risk factors, (b) enhancing availability or usage of protective factors, and (c) encouraging positive youth behaviors.

On the other hand, modern therapy approaches for youths are largely downward extensions of therapy approaches for adults and are based on traditions from the medical field, including psychiatry and psychoanalysis (Kazdin & Weisz, 2003). However, early clinic-based approaches to diagnosing and ameliorating youth problems have also influenced youth therapies of today. For example, child guidance clinics arose in the early twentieth century to combat rising delinquency and other common societal concerns, and these clinics combined psychological assessment practices with interventions based on social work practices and behavioral theories that were prevalent at the time. Youth therapies commonly target smaller units (e.g., individual youths, parents, families, groups of youths) than do preventive interventions. Therapeutic interventions include a variety of theoretical perspectives (e.g., cognitive-behavioral, family systems, psychodynamic), meeting formats (e.g., one-on-one meetings between a child and a therapist, group therapy, family therapy), and locales (e.g., clinics, juvenile justice centers, youths' homes). Unlike preventive interventions, therapeutic interventions are not formally classified based on problem severity or risk. However, more severe problems are generally met with a higher intensity of services (i.e., more frequent meetings, longer duration of treatment) and increased restrictiveness (e.g., residential placement or hospitalization for the most severe problems). Therapeutic approaches are alike in that they target factors (a) within the youth (e.g., emotions, cognitions) and/or (b) within the youth's immediate environment (e.g., family conflict, poor parental discipline

practices) that are thought to cause or maintain existing problems.

Although prevention and therapy approaches have somewhat different backgrounds and methods, it is possible to conceptualize them within a unified framework in which intervention practices are matched to the level of risk or problem severity. Such a framework would parallel the primary/secondary/tertiary prevention classification scheme used by some public health and prevention researchers (e.g., Durlak & Wells, 1998; Gordon, 1983). However, the proposed framework explicitly includes youths who have low levels of problems and are generally neglected by therapy researchers as well as youths who have more severe problems and are neglected by prevention researchers. Integrating youth interventions within a unified framework has two key advantages. First, a unified framework would allow intervention developers and practitioners to better recognize the shared objectives of prevention and therapy, thereby forming the basis for greater collaboration across youth service sectors (e.g., education, mental health, juvenile justice, child welfare). Second, policymakers in charge of intervention funding decisions would be presented with a continuum of interventions that better matches the array of antisocial behavior problems they find in their communities.

With this unified intervention framework in mind, I next discuss factors related to intervention outcomes within the extant research literature. Because distinctions between prevention and therapy approaches have implications for matching intervention methods to levels of risk or problem severity, I will maintain such distinctions in the following section, although I will return later to the aforementioned unified framework.

Factors Linked With Youth Intervention Outcomes

Over the past several decades, meta-analysis has been increasingly used to

integrate research findings from youth intervention trials, as this method provides advantages over the qualitative reviews that once dominated the research literature (Cooper & Hedges, 2009). One key advantage is that meta-analysis allows researchers to identify common factors, or moderators (e.g., characteristics of study participants, interventions, and methods), that influence the size or direction of intervention outcomes (Baron & Kenny, 1986; Holmbeck, 1997). In this section, I discuss findings from pertinent meta-analytic reviews regarding moderators of youth intervention outcomes. For both prevention and therapy moderators, I first discuss factors related to psychosocial outcomes in general and then discuss factors linked with antisocial behavior outcomes in particular.

Prevention. Researchers have identified several characteristics of intervention participants and practices linked with psychosocial outcomes in general. Regarding participant characteristics, preventive interventions have demonstrated larger effects when administered to young children than when administered to older children and adolescents (Durlak & Wells, 1997, 1998). In addition, youths with higher levels of initial risk or with pre-existing problems also appear to benefit more from interventions than do youths with lower levels of risk or problems (Durlak & Wells, 1998). Regarding intervention practices, research has demonstrated that interventions focused on specific developmental issues (e.g., transitions between schools) or that are adapted to the culture of target youths (e.g., cultural beliefs and traditions) have been linked with greater benefits, as are interventions that promote positive relationships (e.g., between youths and peers or adults; Nation et al., 2003). Furthermore, preventive interventions that are multifaceted or comprehensive have shown greater effectiveness than more narrowly

defined interventions (Nation et al., 2003). Lastly, among secondary prevention programs, interventions with behavioral or cognitive-behavioral theoretical foundations have been associated with larger effects than are those based on other theories (Durlak & Wells, 1998).

Reviews focused specifically on preventive interventions for antisocial behavior problems have mirrored the above findings and have identified several additional factors that influence outcomes. Regarding intervention characteristics, “inclusive” programs (i.e., those that do not separate youths with problem behaviors from their regular classrooms) have been associated with better outcomes than “exclusionary” programs among universal school-based interventions (Wilson & Lipsey, 2007). Similarly, individual-format programs have demonstrated better outcomes than group-format programs for selected- and indicated-level (i.e., secondary prevention) school-based interventions (Wilson & Lipsey, 2007). Study design features have also been shown influence antisocial behavior outcomes. For example, effect sizes vary with different types of outcome measures: The greatest benefits have appeared when official records of antisocial behavior (i.e., arrests) were used to measure outcomes, and the smallest benefits have emerged when self- and other-report measures (e.g., checklists completed by youths or about youths by their parents or teachers) were used (Grove et al., 2008). Moreover, follow-up length has been shown to influence effect sizes in a curvilinear fashion such that benefits were generally maintained for 6 months after intervention completion, then decreased between 6 and 12 months following intervention, then increased thereafter (Grove et al., 2008). However, relatively few long-term follow-ups have been included in prior meta-analyses, making it difficult to generalize about patterns

of long-term outcomes. For example, in their review of antisocial behavior prevention trials with 6-month or longer follow-ups, Grove et al. (2008) reported that only 5 of 45 follow-up studies were conducted three years or more after intervention completion.

In sum, meta-analyses of the youth preventive intervention literature have identified factors associated with psychosocial outcomes in general as well as with antisocial behavior in particular. However, an important limitation of these earlier meta-analyses is that they included relatively few studies that assessed whether intervention effects lasted longer a few months after intervention completion. The small number of long-term follow-ups in prior prevention meta-analyses has made it difficult to attain the statistical power that researchers need to identify moderators related to sustained intervention benefits (McClelland & Judd, 1993). Thus, although it is clear that there are (a) a number of viable programs for the short-term prevention of antisocial behavior and (b) at least some programs that evidence longer-lasting effects, it has not been clear why some preventive interventions fare better than others in producing sustained results.

Therapy. As mentioned earlier, therapeutic interventions generally target youths with moderate to severe psychosocial problems. Like meta-analytic reviews of preventive intervention findings, meta-analyses of therapeutic intervention findings have identified characteristics of participants and practices related to psychosocial outcomes in general as well as to antisocial behavior outcomes in particular. Regarding participant characteristics linked with general psychosocial outcomes, researchers have demonstrated that outcomes are generally consistent across participants varying in ethnicity (i.e., ethnic/racial background does not appear to moderate the effect of interventions; Huey & Polo, 2008). In addition, one widely cited meta-analysis demonstrated an interaction

effect between gender and age, such that adolescent girls benefited more from therapy than did boys and younger girls (Weisz et al., 1995). The same meta-analysis identified provider characteristics that interact with the nature of participants' presenting problems; paraprofessionals produced larger effects than professionals or graduate student therapists for youths with externalizing problems, whereas professionals produced larger effects than other provider types for youths with internalizing problems (Weisz et al., 1995). Regarding intervention practices, although Weisz et al. (1995) found that behavioral therapies were more effective than non-behavioral therapies, other meta-analyses have found beneficial short-term therapy outcomes across a variety of theoretical frameworks and corresponding methods of intervention, including child-focused therapy, behavioral therapy, parent training (generally based on behavioral theories), cognitive-behavioral therapy, and multisystemic therapy (Weisz, Hawley, & Jensen-Doss, 2004), as well as play therapy (Bratton, Ray, Rhine, & Jones, 2005). Lastly, conclusions about the relation between follow-up length and psychosocial outcomes have been limited by the relative scarcity of long-term follow-up studies available for analysis. For example, in a recent meta-analysis comparing evidence-based youth therapies to usual care (Weisz et al., 2006), only 50% of the included studies collected follow-up data after posttreatment assessment, and the mean length of follow-up (measured from the start of intervention) in those studies averaged only a little over a year ($M = 65.4$ weeks) and was highly variable ($SD = 57.4$ weeks).

Regarding characteristics of participants and practices linked with antisocial behavior outcomes specifically, meta-analytic studies have demonstrated beneficial effects (e.g., reduced problem behavior) for a variety of outpatient and community-based

practices, including parent training (Lundahl, Risser, & Lovejoy, 2005), multisystemic therapy (MST; Curtis, Ronan, & Borduin, 2004), and cognitive-behavioral therapies (CBT; Sukhodolsky, Kassinove, & Gorman, 2003). Among CBT interventions, those that emphasize both behavioral change and cognitive change appear to be more effective than those that emphasize only cognitive change (Sukhodolsky et al., 2003). Moreover, meta-analyses have revealed moderator interactions (e.g., interactions between participant characteristics and intervention practices). For example, a comparison of parent training to CBT indicated that parent training was more effective for younger children and that CBT was more effective for adolescents (McCart, Priester, Davies, & Azen, 2006). In addition, parent training appears to be more effective when administered individually than in groups for families with high numbers of risk factors (Lundahl et al., 2005).

Even though several types of outpatient and community-based therapeutic interventions have demonstrated relatively consistent evidence of reductions in antisocial behavior in meta-analyses and other systematic analyses (e.g., cost analyses), several widely used treatment strategies (e.g., Scared Straight programs, wilderness challenge programs) for antisocial youths have shown null or even negative (i.e., harmful) effects relative to control conditions (Aos, Miller, & Drake, 2006; Lipsey, 2009). Some researchers (e.g., Dishion, McCord, & Poulin, 1999; Dodge, Dishion, & Lansford, 2006) have raised concerns about possible iatrogenic effects of treatments that place antisocial youths together in groups, although one meta-analysis concluded that there is not a consistent pattern of detrimental outcomes among group therapies for antisocial youths (Weiss, et al., 2005).

It is important to note that many youths at the severe end of the antisocial

behavior spectrum (i.e., those committing more serious and/or violent crimes) are placed together in restrictive residential settings (e.g., group homes, juvenile detention centers). Unfortunately, residential interventions have rarely been compared to outpatient and community-based therapeutic approaches in the extant research literature. However, in a meta-analysis that compared different residential treatment programs to each other, Lipsey (1999) found lower recidivism rates for programs that (a) lasted longer than 6 months, (b) were administered by professionals other than juvenile justice system personnel, (c) were implemented with high fidelity, (d) used specific intervention methods (e.g., social skills training, behavioral treatment), and (f) used specific modalities (e.g., group homes, delivery of multiple services). In addition, in a separate meta-analysis of juvenile sex offender interventions that included both residential and non-residential treatments, Reitzel and Carbonell (2006) reported beneficial effects of interventions on criminal recidivism for intervention participants relative to participants in comparison conditions. However, the small number of studies ($N = 9$) resulted in low statistical power that precluded examinations of moderators.

In sum, reviews of youth therapy trials have identified a number of treatments with beneficial short-term effects on psychosocial outcomes in general as well as on antisocial behavior in particular. Many of the same moderators linked with psychosocial outcomes of prevention are also linked with outcomes of therapy, including participant characteristics (e.g., age, gender), intervention characteristics (e.g., theoretical framework), and characteristics of study methods (e.g., type of outcome variable). Moreover, the therapy literature shares the same shortcomings as the prevention literature, with (a) too few studies of long-term outcomes and (b) limited information on

moderators related to long-term outcomes. Lastly, the artificial divide between prevention and therapy has hindered integration of the outcomes of prevention and therapy intervention trials. Consequently, the present study seeks to integrate research on the long-term outcomes of prevention and therapy trials.

Overview of the Present Study

The present study used meta-analysis to (1) summarize evidence that youth psychosocial interventions influence long-term patterns of antisocial behavior, (2) identify factors that moderate long-term outcomes of interventions, and (3) facilitate integration of findings across the prevention and therapy literatures. For the purpose of this study, long-term was defined as one year or more after the end of an intervention. I chose this criterion because interventions varied greatly in their length (i.e., some interventions lasted for more than a year after they began) and because I was interested in the sustainability of intervention effects after providers were no longer involved in youths' lives. Moderator analyses in the present study reflected factors that have been previously shown to influence psychosocial outcomes in general as well as factors linked with antisocial behavior outcomes in particular. Importantly, the present study combined results from both secondary prevention trials (i.e., selective and indicated interventions) and therapy trials, whereas previous meta-analyses have focused only on prevention or therapy trials. Universal intervention trials were excluded from the present study because their methodological characteristics (e.g., designs that assign participants to conditions by large units such as schools rather than individually, sample sizes often numbering in the thousands) were substantially different from those of prevention and therapy trials.

The present study may have several implications for public policy decisions as

well as for intervention development. First, the results of this study may help to inform decision makers about the effects of varying methods of intervention on long-term patterns of antisocial behavior and crime. Second, the results of this study may prompt intervention developers to examine longer-term outcomes and to refine their intervention models to better facilitate sustained benefits. Third, this study may help to break down conceptual barriers between prevention and therapy for both researchers and practitioners. Lastly, this study may motivate professional organizations and government agencies to include evidence of sustained benefits as part of their evaluation criteria for youth interventions.

Method

Inclusion Criteria

Eligibility criteria for the present meta-analysis were designed to be inclusive, consistent with its integrative goals. Broadly defined, eligible studies were those with (a) a psychosocial intervention targeting youth participants, (b) a research design including a control condition and an average of 10 or more participants per condition at follow-up, (c) an outcome measure assessing antisocial behavior at least one year after the completion of intervention, and (e) availability of a published or unpublished report by December 31, 2010.

Psychosocial interventions included those in which the primary means of intervention occurred through interacting directly with intervention providers (e.g., teachers, therapists) or through interpersonal interactions structured by intervention providers (e.g., with peers or family members), as opposed to psychotropic means of intervention (i.e., medication). Universal interventions were excluded, except when they

targeted a specific at-risk population (e.g., impoverished youths, youths from high-crime neighborhoods). Samples included youths who were less than 18 years old on average at the start of intervention and in which youths did not exhibit pervasive developmental disorders or moderate to severe mental retardation.

Control conditions were required to last the entire length of the follow-up period (i.e., waitlist control groups were not eligible for inclusion) and did not include alternative interventions of interest (i.e., the researchers predicted that the target intervention would produce greater benefits than the control condition). When multiple control or intervention groups were present in the same study, a coin flip was used to decide which control or intervention group to include for analysis, thereby avoiding dependence within studies. Randomization to conditions was not required but was coded as a study design variable.

To be included in the present study, antisocial behavior outcomes must have been assessed at least one year after intervention completion and included criminal behavior, delinquency, aggression, oppositional defiant disorder or conduct disorder symptoms, disruptive behaviors, problem sexual behaviors, or general externalizing behaviors. Substance use was not included as an antisocial behavior outcome, although intervention studies that included substance use or abuse in addition to antisocial behavior outcomes were included.

Lastly, studies included any manuscript that was in print or otherwise completed prior to 2011, including published and unpublished work. For studies that were published during 2011 or later, unpublished reports were utilized.

Studies meeting the above criteria were coded by the primary author and two

research assistants on characteristics of participants, interventions, and study methodologies. Supplementary reports were consulted to obtain additional information when needed; thus, information pertaining to a given “study” may have been derived from multiple research reports.

Search Procedures

The following procedures were used to identify target studies for inclusion. First, searches were performed using PsychInfo for combinations of terms used to describe (1) antisocial behavior (e.g., delinquency, conduct disorder, oppositional defiant disorder, disruptive behavior), (2) youth populations (e.g., youth, juvenile, child, adolescent), and (3) psychosocial interventions (e.g., prevention, therapy, treatment). A full list of search terms is presented in Appendix A. Second, MEDLINE was searched via PubMed, the primary reference database of the U. S. National Library of Medicine. Title and abstract searches were conducted in PubMed using the aforementioned search terms with the following limits: human subjects, ages 0-18 years, clinical trial or controlled clinical trial, English language. Third, reference lists from published English language reviews of youth psychosocial interventions were examined for relevant studies. Fourth, websites of organizations (e.g., Center for the Study and Prevention of Violence, Society of Clinical Child and Adolescent Psychology, Society for Prevention Research) and government agencies (e.g., Office of Juvenile Justice and Delinquency Prevention, Substance Abuse and Mental Health Services Administration) that list evidence-based interventions were consulted to identify other potential references. In addition, messages requesting published and unpublished research were posted on relevant e-mail listservs (e.g., American Psychological Association, Division 53: Society of Clinical Child and

Adolescent Psychology). Lastly, the tables of contents of several journals that regularly publish intervention trials were searched from the years 2000 through 2010 (e.g., *Journal of Consulting and Clinical Psychology*, *American Journal of Community Psychology*).

Coding Procedures

After target studies were identified, the author and two undergraduate research assistants coded the studies for a range of characteristics relevant to participants, interventions, and study methodologies. The specific codes that were used are described next and were based on coding schemes used in previous meta-analyses (e.g., Durlak & Wells, 1997, 1998; Weisz et al., 1995, 2005, 2006). The manual used to code studies is displayed in Appendix B.

Participant characteristics. Characteristics of study samples were coded for general demographic variables including (a) average age of target youths at baseline (in years), (b) gender composition of target youths (percent male), and (c) ethnic background of target youths (i.e., percent Caucasian, percent ethnic minority).

Intervention characteristics. Characteristics of each intervention were coded for (a) intervention type (i.e., prevention or therapy), (b) format of intervention components (i.e., inclusion of individual youth, peer group, parent group, and/or family), (c) total number of intervention components, (d) inclusion of booster sessions (yes/no), (e) use of homework or some form of external assignments (yes/no), (f) average total duration of intervention (in weeks), and (g) average total hours of intervention. In addition, studies were coded for (h) theoretical background of the intervention (i.e., child-focused learning theories, family systems or ecosystemic theories, child-oriented insight-based theories, other/eclectic theories). Lastly, (i) intervention providers were coded as researchers (i.e.,

academic faculty or graduate students), professionals (i.e., persons with advanced degrees in mental health-related fields), or paraprofessionals (i.e., persons lacking in specific graduate-level mental health training, such as teachers, nurses, or community group leaders).

Methodological characteristics. Characteristics of study methodology were coded for (a) average follow-up length (in years), (b) participant attrition from baseline to follow-up (%), and (c) use of random assignment (yes/no). In addition, (d) outcome measures were coded by informant as official records (i.e., court records of serious crimes, or any crime if court records were not separated by severity), youth self-report (i.e., inventories or interviews in which target youths provided responses), parent report (i.e., inventories or interviews in which parents provided responses about their youths), teacher report (i.e., inventories or ratings that teachers or school personnel provided about youths), or other (i.e., including observational and multi-source composite reports). Outcome variables that were not specific to antisocial behavior (e.g., measures of depressive symptoms, academic functioning, or general psychosocial problems) were not recorded.

Intercoder reliability. A subset of 19 studies (28.8 %) was randomly selected from the 66 studies in the sample to evaluate intercoder reliability. Two undergraduate research assistants coded 9 and 10 studies, respectively, and these codes were then compared to the codes of the same studies by the first author. As shown in Table 1, intraclass correlation coefficients (ICCs) for continuous variables ranged from .879 to 1.000, and kappa statistics for categorical variables ranged from .872 to 1.000. These coefficient values compare favorably to similar meta-analyses and indicate relatively high

reliability across coders.

Analytic Strategy

After study characteristics were coded, effect sizes were calculated for each type of outcome measure within a study, and a single effect size was calculated for each study. These effect sizes were adjusted for sample size and sample variance, and homogeneity analyses were then conducted to examine whether sufficient variability was present among effect sizes to warrant further analyses. Analyses of simple moderator effects (i.e., characteristics of participants, interventions, and study methods) and moderator interactions were conducted on all interventions. In addition, prevention and therapy studies were compared on moderator variables for similarities and differences. Finally, simple moderator effects were examined separately for prevention and therapy trials.

Calculations of effect sizes. Cohen's d (Cohen, 1988) effect sizes were calculated with the ES program (Shadish, Robinson, & Lu, 1999) using available statistical information for each antisocial behavior outcome. Effect size values represented the extent to which the target intervention group differed from the control group on a given outcome at follow-up in standard deviation units. Effect sizes were calculated such that a positive number represented a beneficial effect for the intervention group relative to the control group. For example, $d = .25$ would indicate that the intervention group performed one quarter of a standard deviation better than the control group on a given outcome measure. For studies that contained multiple measures of antisocial behavior, an effect size was calculated for each informant (e.g., if a study contained two parent-report measures, a single parent-report effect size was created by averaging their values). An average effect size was also calculated for each study by

averaging across all informants. Using average effect sizes for each informant had the advantage of minimizing method-specific error while maximizing the amount of information gathered from a given study. The study-level average effect size had the advantage of maximizing the number of studies to be included (e.g., a study with a parent-report and official record measure could be compared to a study with a youth-report and teacher-report measure), and it circumvented the issue of shared method variance between measures within a study.

Corresponding to procedures outlined by Wilson and Lipsey (2007), several adjustments were made to adjust for widely varying sample sizes. First, overall sample size was capped at 300 participants, or approximately three standard deviations above the mean sample size at follow-up once several of the largest samples sizes were removed from calculations. This procedure reduced the undue influence of some of the largest studies on the overall average effect size values, while still retaining outliers for analyses. Second, a correction for small sample size was performed by multiplying all effect size values by a factor of $[1 - (3/4N-9)]$, where N was the overall sample size at follow-up. Then, each effect size was weighted by the inverse of its variance to adjust for heterogeneity (Hedges & Olkin, 1985).

Homogeneity analyses (Hedges & Olkin, 1985) were conducted to examine the assumption that all effect size values were drawn from the same population and to aid in determining whether to use fixed- versus random-effects analyses. Results described below were consistent with the assumption of homogeneity ($Q_I(65) = 186.05, p < .001$ for average adjusted effect sizes); thus, a random-effects model was used.

Analyses of effect sizes. All analyses of effect sizes and moderator variables were

conducted in SPSS (Version 19) using specialized macros (Wilson, 2005). To examine whether the average effect size was statistically different from 0, I used a z -test based on the average effect size divided by the standard error of the mean (Wilson, 2005). Cohen's (1988) conventions were used to describe the size of effect: .2 (small), .5 (medium), and .8 (large). Confidence intervals (95%) were also created for average adjusted effect sizes, using the formula $[d \pm 1.96(SE)]$.

Moderator analyses were performed separately for categorical versus continuous variables to identify common factors related to long-term outcomes. For categorical variables (e.g., type of treatment), a Q_b statistic similar to analysis of variance was used (Lipsey & Wilson, 2001). Like analysis of variance, this statistic compares variance between different levels of a variable (i.e., the moderating variable) to the variance within levels. When between-level variance is greater than within-level variance, a significant moderator is present. For continuous moderator variables (e.g., follow-up length), a modified regression approach was used to estimate whether a given moderator accounted for a significant proportion of variance in effect sizes; z -values associated with selected moderators are presented below. All analyses used maximum likelihood estimation (Lipsey & Wilson, 2001) and two-tailed tests.

Results

The literature search and coding procedure yielded 66 studies that met inclusion criteria. As seen in Figure 1, most (60.6%, $k = 40$) of the studies were completed in the last decade (i.e., between 2000 and 2010). Descriptive statistics for each study are displayed in Table 2. The studies represented a total of 11,645 participants and varied widely in participants' mean ages at baseline (range = birth to 17.17 years, $M = 9.67$, SD

= 5.21), lengths of follow-up (range = 1.00 to 35.00 years following intervention, $M = 4.17$, $SD = 6.18$), and sample size at follow-up (range = 20 to 1404 participants). Nearly three-quarters (72.73%) of all follow-ups occurred within three years of intervention completion (see Figure 2). Samples included more boys than girls ($M = 69.67\%$ male, $SD = 21.80$, with $k = 58$ studies providing data) but approximately equal numbers of Caucasian and ethnic minority participants ($M = 52.25\%$ Caucasian, $SD = 32.33$, with $k = 53$ studies providing data). Finally, attrition rates were highly variable across studies (range = 0.00 to 61.00%, $M = 16.08$, $SD = 14.45$, with $k = 64$ studies providing data).

Average Effect Sizes by Data Source

The average adjusted effect size across all studies indicated a small positive effect of intervention on antisocial behavior outcomes ($d = .31$, 95% $CI = .23 - .39$). As seen in Table 3, effect sizes varied with the source of follow-up data, with small to medium effects for official records ($d = .42$, $k = 29$ studies), youth self-report ($d = .26$, $k = 12$), and other report ($d = .56$, $k = 5$ studies; includes observational and cross-source average measures). The smallest effects were observed for parent reports ($d = .16$, $k = 28$ studies). With only one exception (i.e., other report), the confidence intervals around the average adjusted effect sizes for each source did not include 0.00, indicating that the target interventions produced a positive effect (i.e., the interventions reduced antisocial behavior relative to control conditions).

Moderators of Effect Sizes

Participant characteristics. Participant characteristics, which were represented by continuous variables (i.e., average age at baseline, percent male, percent minority), did not predict mean differences in antisocial behavior outcomes between treatment and

control groups (i.e., mean d -values for study). Therefore, there was no evidence that participant characteristics moderated study-level outcomes.

Intervention characteristics. There were no significant moderator effects for continuous variables representing intervention characteristics (i.e., length of intervention in weeks, number of hours of intervention, or number of intervention components). Similarly, there were no significant moderator among the majority of intervention characteristics expressed as categorical variables (i.e., for intervention format, use of booster sessions or homework, theoretical background, and provider occupation). The lone exception was intervention type, for which therapeutic interventions exhibited larger reductions in antisocial behavior ($d = .41$) than did preventive interventions ($d = .25$), $Q_b(1,64), p = .048$.

Three dummy variables for intervention provider (i.e., researcher, professional, and paraprofessional) were examined as potential moderators, and two were found to be significant. Specifically, interventions provided by researchers (i.e., graduate students or academic faculty) had larger benefits, on average ($d = .53$), than did interventions delivered by non-researchers ($d = .27$), $Q_b(1,60) = 8.45, p = .004$. Conversely, interventions delivered by paraprofessionals (e.g., teachers, lay group leaders) had smaller benefits, on average ($d = .26$), than those delivered by non-paraprofessionals ($d = .42$), $Q_b(1,60) = 3.99, p = .046$. Intervention delivery by professionals (i.e., those with advanced degrees specific to mental health or social work) did not moderate effect size.

Methodological characteristics. There were no significant moderator effects for follow-up length (i.e., there was no deterioration in effect size depending on when follow-up assessments was conducted). Likewise, there was no significant moderation of

effect size by rate of participant attrition, use of random assignment, or type of control group.

Moderator interactions. Two-way interaction terms were selected on the basis of findings from previous reviews of youth interventions (e.g., Lundahl et al., 2005; McCart et al., 2006; Weisz et al., 1995). Moderator terms were created by calculating the cross-product between predictor variables, using dummy variables for categorical predictors and mean-centered values for continuous predictors. For significant interaction terms, continuous variables were dichotomized (or trichotomized in the case of age) and presented graphically for descriptive purposes.

There were three significant or marginally significant interaction terms involving gender (i.e., percent male for sample). Specifically, a gender by ethnicity (i.e., percent ethnic minority) interaction indicated that samples composed of lower proportions of boys had larger effects when higher proportions of minority youths were present ($z = -2.05, p = .041$, see Figure 3); however, with higher proportions of boys present, effect size did not vary with sample ethnic composition. Likewise, a gender by peer group format interaction indicated that inclusion of a peer group intervention component was related to smaller effects in samples with higher proportions of boys; however, inclusion of a peer group component made little difference when lower proportions of boys were present ($z = -2.25, p = .025$, see Figure 4). A marginally significant gender by family format interaction suggested that in samples with low proportions of boys, interventions with a family component were more beneficial than those without such a component; however, there was little difference in outcomes between interventions with or without a family component in samples with high proportions of boys ($z = -1.69, p = .09$, see

Figure 5).

There was one additional interaction involving ethnicity. A marginally significant ethnicity by parent group format interaction indicated that samples with higher proportions of minority youths had larger effects when a parent group intervention was included; however, there was a relatively smaller difference in the reverse direction for samples with lower proportions of minority youths ($z = 1.94, p = .052$, see Figure 6).

A significant age by peer group format interaction also emerged. Inclusion of a peer group intervention component was associated with larger effects for preschool-aged youths relative to interventions that did not include a peer component; however, inclusion of a peer group component was linked with smaller effects (i.e., less benefit) for preadolescent and adolescent youths, ($z = -2.23, p = .026$, see Figure 7).

There were no other significant interaction terms for age, gender, ethnicity, or intervention format. There were also no significant interaction terms between intervention type (prevention vs. therapy) and intervention format (inclusion of individual, family, peer group, or parent group). For all interactions, however, caution should be used when interpreting a lack of statistical significance, given a modest number of studies in certain subgroups (e.g., preventive interventions using family interventions) and the difficulties inherent in identifying small or modest-sized interaction effects (McClelland & Judd, 1993). Three-way interactions were not analyzed due to low power and small cell sizes for dichotomous predictors.

Differences between Preventive and Therapeutic Interventions

Although prevention and therapy have similar goals, these two types of interventions target different populations of youths (i.e., heterogeneous populations

varying in risk levels vs. populations who are already displaying serious patterns of problem behavior). Likewise, prevention and therapy frequently diverge in their intervention practices and providers. As such, I sought to document these differences in sample characteristics, interventions, and study methodologies (see Tables 4 and 5). Between-groups *t*-tests for continuous predictors and chi-square tests for categorical predictors revealed several significant or marginally significant differences between prevention and therapy studies.

As shown for sample characteristics in Table 4, prevention trials targeted youths approximately half as old at baseline ($M = 6.57$ years) as those in therapy trials ($M = 13.07$ years). Although sample gender composition did not differ across intervention types, a nonsignificant trend indicated that prevention trials contained marginally more ethnic minority youths than did therapy trials (53.72% vs. 39.59%, respectively).

Regarding intervention characteristics (see Table 4), preventive and therapeutic interventions contained similar numbers of components and doses (i.e., hours of intervention) but differed in lengths of intervention; preventive interventions lasted nearly four times as long as therapeutic interventions (64.00 vs. 18.01 weeks, respectively). Moreover, as shown in Table 5, preventive interventions were more likely to contain a peer group or parent group component, whereas therapeutic interventions were more likely to contain an individual youth component. Furthermore, preventive interventions were more likely to contain a booster session (20.6% vs. 3.1%, respectively) and to be provided by paraprofessionals than were therapeutic interventions (73.3 vs. 40.6%, respectively), while therapeutic interventions were marginally more likely to be provided by professionals. Preventive interventions were also marginally more likely to be based

on child-focused learning theories (i.e., behavioral or cognitive-behavioral) than were therapeutic interventions.

Finally, in terms of study methodology (see Table 4), prevention trials had marginally longer average follow-up periods than did therapy trials (5.54 vs. 2.72 years, respectively). Similarly, prevention trials had significantly larger samples than did therapy trials at follow-up (155.41 vs. 92.22, respectively) but also had greater attrition (22.02% vs. 10.15%, respectively). Prevention trials were also marginally more likely to use random assignment than were therapy trials (91.3% vs. 78.1%, respectively). Thus, overall, there were numerous differences in the way that prevention and therapy intervention trials were conducted. Consequently, moderators of antisocial behavior outcomes were examined separately for prevention and therapy trials.

Effect Sizes and Moderators by Intervention Type

Preventive interventions. The average adjusted effect size for preventive interventions was .25 (95% $CI = .15 - .35$). Homogeneity analyses indicated significant variance among study-level effect sizes, thereby warranting further analysis, $Q_t(33) = 100.09, p < .001$. Only single moderators were examined because analyses of interaction terms lacked sufficient power. Among participant characteristics, gender (i.e., percent male) predicted smaller average adjusted effects for preventive interventions, $z = -2.94, p = .003$. Moderator analyses for age and ethnicity were nonsignificant.

For intervention characteristics, having a greater number of intervention components was associated with larger effects, $z = 2.12, p = .034$. Preventive interventions that used a parent group format also resulted in larger effects ($d = .34$) than those that did not ($d = .16$), $Q_b(1,32) = 3.71, p = .054$. Likewise, preventive

interventions had larger effects when booster sessions were present ($d = .44$) versus absent ($d = .19$), $Q_b(1,32) = 4.66, p = .031$. In addition, preventive interventions based on child-focused learning theories ($d = .33$) had larger effects than those based on other theories ($d = .12$), $Q_b(1,32) = 5.04, p = .025$.

Finally, regarding study methodology characteristics, prevention trials that lacked random assignment ($d = .56$) had larger effects than did those that used random assignment ($d = .23$), $Q_b(1,31) = 3.01, p = .083$. However, only 2 prevention studies did not use random assignment, making any conclusions about assignment strategies tentative. No other methodological characteristics, including length of follow-up, were associated with variance in effect size for preventive interventions.

Therapeutic interventions. The average adjusted effect size for therapeutic interventions was .41 (95% $CI = .28-.53$). Homogeneity analyses indicated significant variance among study-level effect sizes, which provided justification for further analyses, $Q_t(31) = 79.82, p < .001$. As before, only single moderators were examined because analyses of interaction terms lacked sufficient power. No participant characteristic or study methodology characteristic was a significant moderator of effect size.

Among intervention characteristics, larger effects were found when interventions were provided by researchers ($d = .61$) versus non-researchers ($d = .31$), $Q_b(1,30) = 6.17, p = .013$. In contrast, smaller effects were observed when therapeutic interventions were provided by paraprofessionals ($d = .26$) non-paraprofessionals ($d = .49$), $Q_b(1,30) = 3.83, p = .050$. Intervention format and theoretical background characteristics were not significant moderators of effect size for therapeutic interventions.

Discussion

The objectives of this meta-analytic review were (1) to summarize the results of research trials that have examined the long-term effects of youth interventions on antisocial behavior outcomes, (2) to identify moderators of those long-term effects, and (3) to facilitate integration of prevention and therapy research. Regarding the first objective, results from 66 intervention trials revealed modest long-term benefits for target interventions relative to control conditions (mean $d = .31$). Sustained reductions in antisocial behavior were evident up to 35 years after intervention completion for participants who varied widely in the severity of their baseline antisocial behavior and level of risk for future problems. Consistent with prior research (e.g., De Los Reyes & Kazdin, 2005), the strength of long-term effects varied across sources of measurement, with the largest effects evident for official records. Notably, long-term follow-up studies of interventions for antisocial behavior have increased in prevalence over the past few decades, indicating an increased interest among researchers and perhaps an increased demand by policymakers for interventions that produce lasting results.

The second major objective of this study was addressed by examining whether specific characteristics of participants, interventions, or study methodologies influenced the magnitude of long-term effects. Consistent with the results of prior reviews, the results showed that when participant characteristics were considered independent of one another, intervention effects did not vary systematically according to baseline age, gender, or ethnic background (see Durlak & Wells, 1997, 1998; Huey & Polo, 2008; Miranda et al., 2005). Similarly, when intervention characteristics were considered

independently, neither intervention format nor theoretical background predicted variance in effect sizes (cf. Durlak & Wells, 1998; Weisz et al., 1995). However, variation in effect sizes was linked with intervention provider characteristics, such that researchers (e.g., faculty and graduate students) produced greater benefits than non-researchers (e.g., paraprofessionals and professionals). This provider effect may reflect differences between more tightly controlled efficacy trials that are closely linked with academic settings versus more loosely controlled effectiveness trials that better approximate the complex conditions typical of most intervention settings (Henggeler, 2011; McCall, 2009; Wandersmann et al., 2008). Regarding study methods, it is noteworthy that follow-up length did not moderate effect size. That is, intervention benefits did not decrease over time (cf. Grove et al., 2008), which is encouraging to intervention providers and policymakers interested in producing lasting reductions in antisocial behavior and costs to the general public (Aos et al., 2006).

Although there were relatively few significant moderators when considered independent of one another, there were several interactions between moderators. Specifically, a participant gender by ethnicity interaction emerged such that interventions were most beneficial when delivered to samples with relatively fewer boys or more ethnic minority youths. In addition, moderator interactions were evident between participant characteristics and intervention characteristics. For example, in samples with relatively high numbers of boys, peer group interventions were linked with smaller benefits than were other types of interventions. Similarly, peer group interventions were less effective than other interventions for older youths but more effective for younger youths. Together, the interactions involving peer group interventions speak to the

controversy surrounding widely used community intervention practices, such as group therapy or anger management classes for antisocial teens (e.g., Dodge et al., 2006; Weiss et al., 2005). The results are consistent with the idea that older boys' tendency to reinforce each other's antisocial behavior (i.e., deviancy training) reduces the benefits of intervention when antisocial youths are concentrated together (Dishion et al., 2006). For younger populations, however, peer group interventions are more beneficial provided that they are inclusive (i.e., keep youths together with their normal, prosocial peer group; Wilson & Lipsey, 2007). Alternatively, because samples with high concentrations of boys or older youths could be viewed as a proxy for problem severity, the results are consistent with the idea that as severity increases, the potential benefits of peer group interventions are notably reduced.

Additional moderator interactions revealed that samples with relatively fewer boys benefited most when interventions involving their families were used. Similarly, samples with relatively high numbers of ethnic minority youths experienced the greatest benefits when interventions involving groups of parents were used. Understanding such interactions between moderating variables may prove useful to the developers of interventions that target antisocial behavior in underserved youth populations (e.g., girls and ethnic minority youths), for whom evidence of effective interventions is relatively limited.

In line with the third objective to facilitate integration between prevention and therapy research, this meta-analysis examined similarities as well as differences between trials from each intervention area. Not surprisingly, prevention and therapy research trials differed in many ways with respect to participant, intervention, and methodological

characteristics. Consistent with the average effect sizes of previous meta-analyses of prevention (Durlak & Wells, 1997) and therapy (Weisz et al., 1995), prevention trials had a mean effect size that was half that of therapy trials. This finding does not indicate that preventive interventions are less effective than therapeutic interventions in their ability to reduce antisocial behavior, per se. Rather, prevention and therapy generally target different populations requiring different methods of intervention. Consequently, moderator analyses were conducted separately for prevention and therapy.

For preventive interventions, moderator analyses for participant characteristics revealed that neither age nor ethnic composition of samples influenced outcomes. However, intervention benefits diminished as higher proportions of boys were included in prevention samples, which may actually reflect a higher severity of presenting problems (i.e., given boys' tendency to engage in higher levels of antisocial behavior than girls). Regarding intervention characteristics, preventive interventions with a greater number of components were more effective (see also Nation et al., 2003), and among those components, parent group interventions were specifically linked with larger effects, as were booster sessions. In addition, interventions based on child-focused learning (i.e., behavioral) theories were associated with greater effects (see also Durlak & Wells, 1998). Viewed together, these findings suggest that comprehensive approaches that include a behaviorally oriented parent group component (e.g., behavioral parent training) and booster sessions should be strongly considered when selecting preventive interventions for antisocial behavior. Moreover, in light of the moderator interactions described previously, caution should be exercised before using preventive approaches that segregate groups of high-risk or antisocial boys from normative groups of peers. In

addition, when large concentrations of minority participants are present, family interventions are recommended to effectively prevent antisocial behavior.

For therapeutic interventions, no participant characteristics moderated effect size, indicating that sustained effects were possible for varying client populations. However, any conclusions regarding therapeutic effects across different groups should be viewed as tentative because therapeutic interventions in this study (and in the research literature more generally) targeted relatively homogeneous samples of older, mostly Caucasian youths (see Miranda et al., 2005). Regarding intervention characteristics, delivery of therapy by researchers resulted in the greatest benefits, while delivery by professionals and paraprofessionals were linked with relatively smaller benefits. As noted earlier, these findings likely reflect the relatively ideal conditions of therapy efficacy trials versus the relatively greater barriers experienced in typical community practice settings (see Henggeler, 2011). Perhaps more importantly, these results also suggest that professional training is an important factor in ensuring intervention effectiveness when targeting more severe populations like those present in therapy trials.

It is interesting that no specific treatment format or theoretical orientation variable moderated long-term therapy effects, which may suggest that a variety of interventions can produce sustained positive outcomes among antisocial youths. However, limited power made it impossible to test moderator interactions for therapy trials. Thus, for example, it was not possible to directly test whether systemic, family-based treatments (e.g., functional family therapy, multisystemic therapy, multidimensional treatment foster care) are needed for youths with severe antisocial behavior problems, despite endorsement of these treatments by professional organizations (e.g., Center for the Study

and Prevention of Violence) and government agencies (e.g., Office of Juvenile Justice and Delinquency Prevention). Moreover, it was not possible to directly compare community-based therapies to residential treatments that are commonly used with severely antisocial youths. Finally, it was not possible to assess the effects of rarely used but potentially valuable therapy components (e.g., parent groups, booster sessions) that should potentially be considered by intervention developers. Thus, much research remains to be completed to address the crucial question of which interventions should be used for which populations in order to produce the greatest and most enduring benefits.

The present meta-analysis has several methodological limitations. First, the number of interventions studies collected was relatively modest, especially for evaluating moderator interactions. Nevertheless, it is noteworthy that several significant moderator interactions emerged given relatively statistical low power to identify them, since moderator analyses are weighted more toward false negatives (i.e., Type II errors) than false positives (i.e., Type I errors) (McClelland & Judd, 1993). Second, although attempts were made to integrate prevention and therapy research, universal preventive intervention and health promotion/positive youth development intervention trials (see Catalano et al., 2004) were excluded because the characteristics of such trials differ substantially (e.g., nested designs, sample sizes in the thousands) from the characteristics of the studies included in the present meta-analysis. Third, I chose to include only the longest follow-up study when a series of follow-up studies was conducted with the same sample (e.g., multisystemic therapy and nurse-family partnership researchers have published multiple follow-ups for the same samples). Analyses of within-series changes are especially challenging because measurement strategies often change from one follow-up study to

the next. Finally, I used outcome-focused study selection criteria (i.e., the study had at least one antisocial behavior outcome measure) rather than problem-focused (i.e., the study used an intervention designed specifically to influence antisocial behavior). The advantage to an outcome-focused selection approach is that it captures a wide range of interventions (e.g., interventions that target depressed youths or children exposed to domestic violence, who are at risk for multiple types of emotional and behavioral problems). The disadvantage to this selection approach is that some interventions included for analysis were not expressly intended to affect antisocial behavior, which may result in relatively smaller effect sizes.

In conclusion, intervention developers have created a multitude of interventions that effectively reduce antisocial behavior over relatively brief periods of time. However, research suggests that antisocial behavior can and often does continue beyond childhood and adolescence into adulthood. The present study demonstrated that many interventions show evidence of long-term benefits and that these interventions can be effective when delivered to youth populations that vary greatly in their ages, ethnic backgrounds, and propensity for future antisocial behavior. However, effectively addressing antisocial behavior on a large scale will require that intervention developers, policymakers, and providers work to coordinate interventions within an integrated system of care that includes both prevention and therapy (Dodge, 2008). A continued piecemeal approach is unlikely to yield substantial or sustained results, and increased integration among intervention services will facilitate a better match between intervention practices and the continuum of problem behavior experienced by youths, their families, and the communities in which they live. Such integration will require leadership from the groups

that have created and maintained divisions between service sectors, such as the professional organizations and government agencies that set standards for the way society addresses problems among our youth. Only through such concerted leadership can a more significant impact be made on youth antisocial behavior.

References

- Achenbach, T. M. (1991). *Manual for Child Behavior Checklist/ 4-18 and 1991 Profile*. Burlington, VT: University of Vermont, Dept. of Psychiatry.
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders: DSM-IV-TR*. Washington, DC: Author.
- American Psychological Association, Task Force on Promotion and Dissemination of Psychological Procedures. (1995). Training in and dissemination of empirically-validated psychological treatments. *The Clinical Psychologist*, 48, 3-23.
- *Alexander, J. F., & Parsons, B. V. (1973). Short-term behavioral intervention with delinquent families: Impact on family process and recidivism. *Journal of Abnormal Psychology*, 81, 219-225. doi:10.1037/h0034537
- Aos, S., Miller, M., & Drake, E. (2006). *Evidence-based public policy options to reduce future prison construction, criminal justice costs, and crime rates*. Olympia: Washington State Institute for Public Policy. Retrieved from: www.wsipp.wa.gov
- *Arbuthnot, J., & Gordon, D. A. (1986). Behavioral and cognitive effects of a moral reasoning development intervention for high-risk behavior-disordered adolescents. *Journal of Consulting and Clinical Psychology*, 54, 208-216. doi:10.1037/0022-006X.54.2.208
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51, 1173-1182. doi:10.1037/0022-3514.51.6.1173
- Benjamin, L. T. (2005). A history of clinical psychology as a profession in America (and

a glimpse at its future). *Annual Review of Clinical Psychology*, *1*, 1-30.

doi:10.1146/annurev.clinpsy.1.102803.143758

*Bernat, D. H., August, G. J., Hektner, J. M., & Bloomquist, M. L. (2007). The early risers preventive intervention: Testing for six-year outcomes and mediational processes. *Journal of Abnormal Child Psychology*, *35*, 605-617.

doi:10.1007/s10802-007-9116-5

*Black, M. M., Dubowitz, H., Krishnakumar, A., & Starr, R. H. Jr. (2007). Early intervention among children with failure to thrive: Follow-up at age 8. *Pediatrics*, *120*, 59-69. doi:10.1542/peds.2006-1657

*Boisjoli, R., Vitaro, F., Lacourse, E., Barker, E. D., & Tremblay, R. E. (2007). Impact and clinical significance of a preventive intervention for disruptive boys. *British Journal of Psychiatry*, *191*, 415-419. doi:10.1192/bjp.bp.106.030007

*Borduin, C. M., Schaeffer, C. M., & Heiblum, N. (2009). A randomized clinical trial of multisystemic therapy with juvenile sexual offenders: Effects on youth social ecology and criminal activity. *Journal of Consulting and Clinical Psychology*, *77*, 26-37. doi: 10.1037/a0013035

Bratton, S. C., Ray, D. Rhine, T., & Jones, L. (2005). The efficacy of play therapy with children: A meta-analytic review of treatment outcomes. *Professional Psychology: Research and Practice*, *36*, 376-390. doi:10.1037/0735-7028.36.4.376

*Brody, G. H., Kogan, S. M., Chen, Y., & Murry, V. M. (2008). Long-term effects of the strong African American families program on youths' conduct problems. *Journal of Adolescent Health*, *43*, 474-481. doi:10.1016/j.jadohealth.2008.04.016

- *Brotman, L. M., Gouley, K. K., Huang, K. Y., Rosenfelt, A., O'Neal, C., & Klein, K., & Shrout, P. (2008). Preventive intervention for preschoolers at high risk for antisocial behavior: Long-term effects on child physical aggression and parenting practices. *Journal of Clinical Child and Adolescent Psychology, 37*, 386-396.
doi:10.1080/15374410801955813
- *Bry, B. H. (1982). Reducing the incidence of adolescent problems through preventive intervention: One-, and five-year follow-up. *American Journal of Community Psychology, 10*, 265-276. doi:10.1007/BF00896494
- *Caldwell, M. F., & Van Rybroek, G. J., (2001). Efficacy of the decompression treatment model in the clinical management of violent juvenile offenders. *International Journal of Offender Therapy and Comparative Criminology, 45*, 469-477.
doi:10.1177/0306624X01454006
- *Carpentier, M. Y., Silovsky, J. F., & Chaffin, M. (2006). Randomized trial of treatment for children with sexual behavior problems: Ten-year follow-up. *Journal of Clinical and Consulting Psychology, 74*, 482-488. doi:10.1037/0022-006X.74.3.482
- Catalano, R. F., Berglund, M. L., Ryan, J. A. M., Lonczak, H. S. & Hawkins, J. D. (2004). Positive youth development in the United States: Research findings on evaluations of positive youth development programs. *Annals of the American Academy of Political and Social Science, 591*, 98-123.
doi:10.1177/0002716203260102
- *Catalano, R. F., Gainey, R. R., Fleming, C. B., Haggerty, K. P., & Johnson, N. O. (1999). An experimental intervention with families of substance abusers: One-

year follow-up of the focus on families project. *Addiction*, 94, 241-254.

doi:10.1046/j.1360-0443.1999.9422418.x

*Chamberlain, P., Leve, L. D., & DeGarmo, D. S. (2007). Multidimensional treatment foster care for girls in the juvenile justice system: 2-year follow-up of a randomized clinical trial. *Journal of Consulting and Clinical Psychology*, 75, 187-193. doi:10.1037/0022-006X.75.1.187

*Cox, S. M. (1999). An assessment of an alternative education program for at-risk delinquent youth. *Journal of Research in Crime and Delinquency*, 36, 323-336. doi:10.1177/0022427899036003004

Center for the Study and Prevention of Violence (n.d.). *Blueprints for violence prevention*. Retrieved May 5, 2012 from <http://www.colorado.edu/cspv/blueprints/index.html>

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.) Hillsdale, NJ: Erlbaum.

Cohen, M. A. (1998). The monetary value of saving high-risk youth. *Journal of Quantitative Criminology*, 14, 5-33. doi:10.1023/A:1023092324459

Cooper, H., & Hedges, L. V. (2009). Research synthesis as a scientific process. In H. Cooper, L. V. Hedges, & J. C. Valentine (Eds.) *Handbook of research synthesis and meta-analysis* (2nd ed.). New York, NY: Russell Sage Foundation.

Curtis, N. M., Ronan, K. R., & Borduin, C. M. (2004). Multisystemic treatment: A meta-analysis of outcome studies. *Journal of Family Psychology*, 18, 411-419. doi:10.1037/0893-3200.18.3.411

De Los Reyes, A., & Kazdin, A. E. (2005). Informant discrepancies in the assessment of

childhood psychopathology: A critical review, theoretical framework, and recommendations for further study. *Psychological Bulletin*, *131*, 483-509. doi: 10.1037/0033-2909.131.4.483

*Dishion, T. J., & Andrews, D. W. (1995). Preventing escalation in problem behaviors with high-risk young adolescents, Immediate and 1-year outcomes. *Journal of Consulting and Clinical Psychology*, *63*, 538-548. doi:10.1037/0022-006X.63.4.538

Dishion, T. A., McCord, J., & Poulin, F. (1999). When intervention harm: Peer groups and problem behavior. *American Psychologist*, *54*, 755-764. doi:10.1037/0003-066X.54.9.755

Dodge, K. A. (2008). Framing public policy and prevention of chronic violence in American youths. *American Psychologist*, *63*, 573-590. doi: 10.1037/0003-066X.63.7.573

Dodge, K. A., Dishion, T. J., & Lansford, J. E. (2006). Deviant peer influences in intervention and public policy for youth. *Social Policy Report*, *XX* (1).

Durlak, J. A., & Wells, A. M. (1997). Primary prevention mental health programs for children and adolescents: A meta-analytic review. *American Journal of Community Psychology*, *25*, 115-152. doi:10.1023/A:1024654026646

Durlak, J. A., & Wells, A. M. (1998). Evaluation of indicated preventive intervention (secondary prevention) mental health programs for children and adolescents. *American Journal of Community Psychology*, *26*, 775-802. doi:10.1023/A:1022162015815

*Eckenrode, J., Campa, M., Luckey, D. W., Henderson, C. R. Jr., Cole, R., Kitzman,

- H.,...Olds, D. (2010). Long-term effects of prenatal and infancy nurse home visitation on the life course of youths. *Archives of Pediatric and Adolescent Medicine*, *164*, 9-16. doi:10.1001/archpediatrics.2009.240
- *Eddy, J. M., Reid, J. B., Stoolmiller, M., & Fetrow, R. A. (2003). Outcomes during middle school for an elementary school-based preventive intervention for conduct problems: Follow-up results from a randomized trial. *Behavior Therapy*, *34*, 535-552. doi: 10.1016/S0005-7894(03)80034-5
- *Eddy, J. M., Whaley, R. B., & Chamberlain, P. (2004). The prevention of violent behavior by chronic and serious male juvenile offenders: A 2-year follow-up of a randomized clinical trial. *Journal of Emotional and Behavioral Disorders*, *12*:2, 2-8. doi:10.1177/10634266040120010101
- *Elliot, J., Prior, M., Merrigan, C., & Ballinger, K. (2002). Evaluation of a community intervention programme for preschool behavior problems. *Journal of Pediatricians Child Health*, *38*, 41-50. doi:10.1046/j.1440-1754.2002.00713.x
- *Elrod, H. P., & Minor, K. L. (1992). Second wave evaluation of a multi-faceted intervention for court probationers. *Journal of Offender Therapy and Comparative Criminology*, *36*, 247-262. doi:10.1177/0306624X9203600308
- *Forgatch, M. S., Patterson, G. R., DeGarmo, D. S., & Beldavs, Z. G. (2009). Testing the Oregon delinquency model with 9-year follow-up of the Oregon Divorce Study. *Development and Psychopathology*, *21*, 637-660.
doi:10.1017/S0954579409000340
- Foster, E. M., Jones, D., & the Conduct Problems Prevention Research Group. (2006). Can a costly intervention be cost-effective? An analysis of violence prevention.

Archives of General Psychiatry, 63, 1284-1291. doi:10.1001/archpsyc.63.11.1284

- *Gordon, D. A., Graves, K., & Arbuthnot, J. (1995). The effect of functional family therapy for delinquents on adult criminal behavior. *Criminal Justice and Behavior*, 22, 60-73. doi:10.1177/0093854895022001005
- Gordon, R. S. Jr. (1983). An operational classification of disease prevention. *Public Health Reports*, 98, 107-109.
- Greenberg, M. T., Domitrovich, C., & Bumbarger B. (2001). The prevention of mental disorders in school-aged children: Current state of the field. *Prevention & Treatment*, 4, 1-62. doi:10.1037/1522-3736.4.1.41a
- *Gross, D., Garvey, C., Julion, W., Fogg, L. Tucker, S., & Makros, H. (2009). Efficacy of the Chicago Parent Program with low-income African American and Latino parents of young children. *Preventive Science*, 10, 54-65. doi:10.1007/s11121-008-0116-7
- Grove, A. B., Evans, S. W., Pastor, D. A., & Mack, S. D. (2008). A meta-analytic examination of follow-up studies of programs designed to prevent the primary symptoms of oppositional defiant and conduct disorders. *Aggression and Violent Behavior*, 13, 169-184. doi:10.1016/j.avb.2008.03.001
- *Guerra, N. C., & Slaby, R. G. (1990). Cognitive mediators of aggression in adolescent offenders: 2. Intervention. *Developmental Psychology*, 26, 269-277. doi:10.1037/0012-1649.26.2.269
- Hedges, L. V., & Olkin, I. (1985). *Statistical methods for meta-analysis*. Orlando: Academic Press.
- Henggeler, S. W. (2011). Efficacy studies to large-scale transport: The development and

validation of MST programs. *Annual Review of Clinical Psychology*, 7, 351-381.
doi:10.1146/annurev-clinpsy-032210-104615

*Henggeler, S. W., Melton, G. B., Brondino, M. J., & Scherer, D. G., & Hanley, J. H., (1997). Multisystemic therapy with violent and chronic juvenile offenders and their families: The role of treatment fidelity in successful dissemination. *Journal of Consulting and Clinical Psychology*, 65, 821-833. doi:10.1037/0022-006X.65.5.821

*Henggeler, S. W., Melton, G. B., Smith, L. A., Schoenwald, S. K., & Hanley, J. H. (1993). Family preservation using multisystemic treatment, Long-term follow-up to a clinical trial with serious juvenile offenders. *Journal of Child and Family Studies*, 2, 283-293. doi:10.1007/BF01321226

Holmbeck, G. N., (1997). Toward terminological, conceptual, and statistical clarity in the study of mediators and moderators: Examples from the child-clinical and pediatric psychology literatures. *Journal of Consulting & Clinical Psychology*, 65, 599-610. doi:10.1037/0022-006X.65.4.599

Huey, S. J. Jr., & Polo, A. J. (2008). Evidence-based psychosocial treatments for ethnic minority youth. *Journal of Clinical Child & Adolescent Psychology*, 37, 262-301. doi:10.1080/15374410701820174

*Jesness, C. F. (1975). Comparative effectiveness of behavior modification and transactional analysis programs for delinquents. *Journal of Consulting and Clinical Psychology*, 43, 758-779. doi:10.1037/h0078109

*Johnson, D. L., & Walker, T. (1987). Primary prevention of behavior problems in Mexican-American children. *American Journal of Community Psychology*, 15,

375-386. doi:10.1007/BF00915208

*Jouriles, E. N., McDonald, R., Rosenfield, D., Stephens, N., Corbitt-Shindler, D., & Miller, P. C. (2009). Reducing conduct problems among children exposed to intimate partner violence: A randomized clinical trial examining effects of project support. *Journal of Consulting and Clinical Psychology, 77*, 705-717.
doi:10.1037/a0015994

*Kam, C., Greenberg, M. T., & Kusche, C. A. (2004). Sustained effects of the PATHS curriculum on the social and psychological adjustment of children in special education. *Journal of Emotional and Behavioral Disorders, 12*, 66-78.
doi:10.1177/10634266040120020101

*Kazdin, A. E., Bass, D., Siegel, T., & Thomas, C. (1989). Cognitive-behavioral therapy and relationship therapy in the treatment of children referred for antisocial behavior. *Journal of Consulting and Clinical Psychology, 57*, 522-535.
doi:10.1037/0022-006X.57.4.522

*Kazdin, A. E., Esveldt-Dawson, K., French, N. H., & Unis, A. S. (1987). Problem-solving skills training and relationship therapy in the treatment of antisocial child behavior. *Journal of Consulting and Clinical Psychology, 55*, 76-85.
doi:10.1037/0022-006X.55.1.76

Kazdin, A. E., & Weisz, J. R. (2003). Introduction: Context and background of evidence-based psychotherapies for children and adolescents. In A. E. Kazdin & J. R. Weisz (Eds.) *Evidence-based psychotherapies for children and adolescents* (pp. 3-20). New York: Guilford.

*Kitzman, H. J., Olds, D. L., Cole, R. E., Hanks, C. A., Anson, E. A., Arcoleo, K.

- J.,...Holmberg, J. R. (2010). Enduring effects of prenatal and infancy home visiting by nurses on children. *Archives of Pediatric and Adolescent Medicine*, 164, 412-418. doi:10.1001/archpediatrics.2010.76
- *Kolko, D. J., Dorn, L. D., Bukstein, O. G., Pardini, D., Holden, E. A., & Hart, E. A. (2009). Community vs. clinic-based modular treatment of children with early-onset ODD or CD: A clinical trial with 3-year follow-up. *Journal of Abnormal Child Psychology*, 37, 591-609. doi:10.1007/s10802-009-9303-7
- *Kratochwill, T. R., McDonald, L., Levin, J. L., Scalia, P. A., & Coover, G. (2009). Families and schools together: An experimental study of multi-family support groups for children at risk. *Journal of School Psychology*, 47, 245-265. doi:10.1016/j.jsp.2009.03.001
- Laub, J. H., & Sampson, R. J. (2001). Understanding desistance from crime. In M. Tonry (Ed.) *Crime and Justice: A Review of Research, Vol. 28* (pp. 1-69). Chicago: University of Chicago Press.
- *Lally, J. R., Mangione, P. L., Honig, A. S. & Wittner, D. S. (1988). More pride, less delinquency: Findings from the ten-year follow-up study of the Syracuse University Family Development Project research program. *Zero to Three*, 8, 13-18.
- *Lavigne, J. V., LeBailly, S. A., Gouze, K. R., Cicchetti, C., Pochyly, J., Arend, R.,... Binns, H. J. (2008). Treating oppositional defiant disorder in primary care: A comparison of three models. *Journal of Pediatric Psychology*, 33:5, 449-461. doi:10.1093/jpepsy/jsm074
- *Lee, R., & Olejnik, S. (1981). Professional outreach counseling can help the juvenile

probationer: A two-year follow-up study. *The Personnel and Guidance Journal*, 59, 445-449. doi:10.1002/j.2164-4918.1981.tb00592.x

- *Liddle, H. A., Dakof, G. A., Parker, K., Diamond, G. S., Barrett, K., & Tejada, M. (2001). Multidimensional family therapy for adolescent drug abuse: Results of a randomized clinical trial. *American Journal of Drug and Alcohol Abuse*, 27, 651-688. doi:10.1081/ADA-100107661
- Lipsey, M. W. (1999). Can intervention rehabilitate serious delinquents? *Annals of the American Academy of Political and Social Science*, 564, 142-166. doi:10.1177/0002716299564001009
- Lipsey, M. W. (2009). The primary factors that characterize effective interventions for juvenile offenders: A meta-analytic overview. *Victims and Offenders*, 4, 124-147. doi: 10.1080/115564880802612573
- Lipsey, M. W., & Wilson, D. B. (2001). *Practical meta-analysis: Applied social methods research series* (Vol. 49). Thousand Oaks, CA: Sage.
- *Lochman, J. E. (1992). Behavioral intervention with aggressive boys: Three-year follow-up and preventive effects. *Journal of Consulting and Clinical Psychology*, 60, 426-432. doi:10.1037/0022-006X.60.3.426
- *Lochman, J. E., & Wells, K. C. (2004). The Coping Power Program for preadolescent aggressive boys and their parents: Outcome effects at the 1-year follow-up. *Journal of Consulting and Clinical Psychology*, 72, 571-578. doi: 10.1037/0022-006X.72.4.571
- Lundahl, B., Risser, H. J., & Lovejoy, M. C. (2005). A meta-analysis of parent training: Moderators and follow-up effects. *Clinical Psychology Review*, 26, 86-104. doi:

10.1016/j.cpr.2005.07.004

- *Mann, E. A., & Reynolds, A. J. (2006). Early intervention and delinquency prevention: Evidence from the Chicago Longitudinal Study. *Social Work Research, 30*, 153-167. doi: 10.1093/swr/30.3.153
- McCall, R. B. (2009). Evidence-based programming in the context of practices and policy. *Social Policy Report, XXIII* (3).
- McCart, M. R., Priester, P. E., Davies, W. H., & Azen, R. (2006). Differential effectiveness of behavioral parent-training and cognitive-behavioral therapy for antisocial youth: A meta-analysis. *Journal of Abnormal Child Psychology, 34*, 527-543. doi:10.1007/s10802-006-9031-1
- McClelland, G. H., & Judd, C. M. (1993). Statistical difficulties of detecting interactions and moderator effects. *Psychological Bulletin, 114*, 376-390. doi:10.1037/0033-2909.114.2.376
- *McCord, J. (1978). A thirty-year follow-up of treatment effects. *American Psychologist, 33*, 284-289. doi:10.1037/0003-066X.33.3.284
- *McDonald, R., Jouriles, E. N., Skopp, N. A. (2006). Reducing conduct problems among children brought to women's shelters: Intervention effects 24 months following services. *Journal of Consulting and Clinical Psychology, 20*, 127-136. doi:10.1037/0893-3200.20.1.127
- *Miller-Heyl, J., MacPhee, D., & Fritz, J. J. (1998). DARE to be you: A family-support, early prevention program. *Journal of Primary Prevention, 18*, 257-284. doi:10.1023/A:1024602927381
- Miranda, J., Bernal, G., Lau, A., Kohn, L., Hwang, W. C., LaFromboise, T. (2005). State

of the science on psychosocial interventions for ethnic minorities. *Annual Review of Clinical Psychology*, 1, 113-142.

doi:10.1146/annurev.clinpsy.1.102803.143822

Moffitt, T. E. (1993). Adolescence-limited and lifecourse-persistent antisocial behavior: A developmental taxonomy. *Psychological Review*, 100, 674-701.

doi:10.1037/0033-295X.100.4.674

*Muratori, F., Picchi, L., Bruni, G., Patarnello M., & Romagnoli, G. (2003). A two-year follow-up of psychodynamic psychotherapy for internalizing disorders in children. *Journal of the American Academy of Child and Adolescent Psychiatry*, 42:3, 331-339. doi:10.1097/00004583-200303000-00014

Mrazek, P. J., & Haggerty, R. J. (1994). *Reducing risks for mental disorders: Frontiers for preventive intervention research*. Washington, D. C.: Institute of Medicine

*Myers, W. C., Burton, P., Sanders, P. D., Donat, K. M., Cheney, J. O., Fitzpatrick, T. M., & Monaco, L. (2000). Project back-on-track at 1 year, A delinquency treatment program for early-career juvenile offenders. *Journal of the American Academy of Child & Adolescent Psychiatry*, 39, 1127-1134.

doi:10.1097/00004583-200009000-00012

O'Connell, M. E., Boat, T., Warner, K. E. (2009). *Preventing mental, emotional, and behavioral disorders among young people: Progress and possibilities*.

Washington, D. C.: National Research Council and Institute of Medicine

Office of Juvenile Justice and Delinquency Prevention (n.d.). *OJJDP model programs guide*. Retrieved May 5, 2012 from <http://www2.dsgonline.com/mpg/Default.aspx>

Olds, D. L., Robinson, J., Pettitt, L., Luckey, D. W., Holmberg, J., Ng, R.

- K.,...Henderson, C. R. (2004). Effects of home visits by paraprofessionals and by nurses: Age 4 follow-up results of a randomized trial. *Pediatrics, 114*, 1560-1568. doi:10.1542/peds.2004-0961
- Reitzel, L. R., & Carbonell, J. L. (2006). The effectiveness of sexual offender treatment for juveniles as measured by recidivism: A meta-analysis. *Sex Abuse, 18*, 410-421. doi:10.1177/107906320601800407
- *Rey, J. M, Enshire, E., Wever, C., & Appolonov, I. (1998). Three-year outcome of disruptive adolescents treated in a day program. *European Child and Adolescent Psychiatry, 7*, 42-48. doi:10.1007/s007870050044
- *Rohde, P., Clarke, G. N., Mace, D. E., Jorgensen, J. S., & Seeley, J. R. (2004). An efficacy/ effectiveness study of cognitive-behavioral treatment for adolescents with comorbid major depression and conduct disorder. *Journal of the American Academy of Child and Adolescent Psychiatry, 43:6*, 1-9. doi:10.1097/01.chi.0000121067.29744.41
- *Sarason, I. G., & Ganzer, V. J. (1973). Modeling and group discussion in the rehabilitation of juvenile delinquents. *Journal of Counseling Psychology, 20*, 442-449. doi:10.1037/h0035389
- *Sawyer, A. M., & Borduin, C. M. (2010). *Effects of multisystemic therapy through midlife: A 21.9-year follow-up to a randomized clinical trial with serious and violent juvenile offenders*. Unpublished Manuscript.
- *Schweinhart, L. J. (2007). Crime prevention by the High/Scope Perry Preschool program. *Victims and Offenders, 2*, 141-160 doi:10.1080/15564880701263064
- *Sexton, T., & Turner, C. W. (2010). The effectiveness of functional family therapy for

- youth with behavioral problems in a community practice setting. *Journal of Family Psychology*, 24, 339-348. doi:10.1037/a0019406
- Shadish, W. R., Robinson, L., & Lu, C. (1999). *ES: A computer program for effect size calculation* [Computer manual]. Memphis, TN: University of Memphis.
- *Shaw, D. S., Supplee, L., Dishion, T. J., Gardner, R., & Arnds, K. (2006). Randomized trial of a family-centered approach to the prevention of early conduct problems: 2-year effects of the family check-up in early childhood. *Journal of Consulting and Clinical Psychology*, 74, 1-9. doi:10.1037/0022-006X.74.1.1
- *Shore, M. F., & Massimo, J. L. (1979). Fifteen years after treatment: A follow-up study of comprehensive vocationally-oriented psychotherapy. *American Journal of Orthopsychiatry*, 49, 240-245. doi:10.1111/j.1939-0025.1979.tb02605.x
- *Smolkowski, K., Biglan, A., Barrera, M., Taylor, T., Black, C., & Blair, J. (2005). Schools and Homes in Partnership (SHIP): Long-term effects of a preventive intervention focused on social behavior and reading skill in early elementary school. *Prevention Science*, 6, 1-13. doi:10.1007/s11121-005-3410-7
- Society for Clinical Child and Adolescent Psychology (n.d.). *Evidence-based mental health treatments for children and adolescents*. Retrieved May 5, 2012 from <http://www.abct.org/sccap/>
- *Stolberg, A. L., & Mahler, J. (1994). Enhancing treatment gains in a school-based intervention for children of divorce through skill training, parental involvement, and transfer procedures. *Journal of Consulting and Clinical Psychology*, 62, 147-156. doi:10.1037/0022-006X.62.1.147
- *Strayhorn, J. M., & Weidman, C. S. (1991). Follow-up one year after parent-child

interaction training, Effects on behavior of preschool children. *American Academy of Child and Adolescent Psychiatry*, 30, 138-143.

doi:10.1097/00004583-199101000-00021

Substance Abuse and Mental Health Services Administration (n.d.). *National registry of evidence-based programs and practices*. Retrieved May 5, 2012 from <http://nrepp.samhsa.gov/>

Sukhodolsky, D. G., Kassinove, H., & Gorman, B. S. (2004). Cognitive-behavioral therapy for anger in children and adolescents: A meta-analysis. *Aggression & Violent Behavior*, 9, 247-269. doi:10.1016/j.avb.2003.08.005

*Szapocznik, J., Rio, A., Murray, E., Cohen, R., Scopetta, M., Rivas-Vazquez, A., . . . Kurtines, W. (1989). Structural family versus psychodynamic child therapy for problematic Hispanic boys. *Journal of Consulting and Clinical Psychology*, 57, 571-578. doi:10.1037/0022-006X.57.5.571

*Timmons-Mitchell, J., Bender, M. B., Kishna, M. A., & Mitchell, C. C. (2006). An independent effectiveness trial with juvenile justice youth. *Journal of Clinical Child and Adolescent Psychology*, 35, 227-236. doi:10.1207/s15374424jccp3502_6

*Toldson, I. A., Harrison, M. G., Perine, R., Carreiro, P., & Caldwell, L. D. (2006). Assessing the impact of family process on rural African American adolescents' competence and behavior using latent growth curve analysis. *The Journal of Negro Education*, 75, 440-442.

*Verduyn, C., Barrowclough, C., Roberts, J., TARRIER, N., & Harrington, R. (2003). Maternal depression and child behaviour problems: Randomised placebo-

- controlled trial of a cognitive-behavioural group intervention. *British Journal of Psychiatry*, 183, 342-348. doi: 10.1192/bjp.183.4.342
- Wandersmann, A., Duffy, J., Flaspohler, P., Noonan, R., Lubbel, K., Stillman, L.,...& Saul, J. (2008). Bridging the gap between prevention research and practice: The interactive systems framework for dissemination and implementation. *American Journal of Community Psychology*, 41, 171-181. doi:10.1007/s10464-008-9174-z
- *Weis, R., & Toolis, E. E. (2009). Evaluation of a voluntary military-style residential treatment program for youths with conduct problems: 6- and 36-month outcomes. *Psychological Services*, 6:2, 139-153. doi:10.1037/a0015307
- Weiss, B., Caron, A., Ball, S., Tapp, J., Johnson, M., & Weisz, J. R. (2005). Iatrogenic effects of group treatment for antisocial youth. *Journal of Consulting and Clinical Psychology*, 73, 1036-1044. doi:10.1037/0022-006X.73.6.1036
- Weisz, J. R., Hawley, K. M., & Jensen-Doss, A. (2004). Empirically tested psychotherapies for youth internalizing and externalizing disorders and problems. *Child and Adolescent Psychiatric Clinics of North America*, 13, 729-815. doi:10.1016/j.chc.2004.05.006
- Weisz, J. R., Jensen-Doss, A., Hawley, K. M. (2005). Youth psychotherapy outcome research: A review and critique of the evidence base. *Annual Review of Psychology*, 56, 337-363. doi:10.1146/annurev.psych.55.090902.141449
- Weisz, J. R., Jensen-Doss, A., & Hawley, K. M. (2006). Evidence-based youth psychotherapies versus usual clinical care: A meta-analysis of direct comparisons. *American Psychologist*, 61, 671-689. doi:10.1037/0003-066X.61.7.671
- Weisz, J. R., Weiss, B., Han, S. S., Granger, D. A., & Morton, T. (1995). Effects of

psychotherapy with children and adolescents revisited: A meta-analysis of treatment outcome studies. *Psychological Bulletin*, 117, 450-468.

doi:10.1037/0033-2909.117.3.450

Welsh, B. C., Loeber, R., Stevens, B. R., Stouthamer-Loeber, M., Cohen, M. A., & Farrington, D. P. (2008). Costs of juvenile crime in urban areas: A longitudinal perspective. *Youth Violence and Juvenile Justice*, 6, 3-27.

doi:10.1177/1541204007308427

*Wilmshurst, L. A. (2002). Treatment programs for youth with emotional and behavioral disorders: An outcome study of two alternate approaches. *Mental Health Services Research*, 4, 85-96. doi:10.1023/A:1015200200316

Wilson, D. B. (2005). SPSS Macros. Retrieved September 22, 2009, from

<http://mason.gmu.edu/~dwilsonb/ma.html>

Wilson, S. J., & Lipsey, M. W. (2007). School-based interventions for aggressive and disruptive behavior: Update of a meta-analysis. *American Journal of Preventive Medicine*, 33, 130-143. doi:10.1016/j.amepre.2007.04.011

*Wodarski, J. S., Filipczak, J., McCombs, D., Koustenis, G., & Rusilko, S. (1979).

Follow-up on behavioral intervention with troublesome adolescents. *Journal of Behavior Therapy and Experimental Psychiatry*, 10, 181-188. doi:10.1016/0005-7916(79)90057-0

Appendix A: List of Search Terms by Concept

<u>Antisocial Behavior</u>	<u>Youth Population</u>	<u>Intervention</u>
anger	youth	clinical trial
antisocial	child	intervention
behavior problems	adolescent	prevention
conduct problems	juvenile	therapy
conduct disorder	boy	treatment
crime	girl	
criminal	parent	
delinquent		
delinquency		
disruptive		
externalizing		
oppositional		
oppositional defiant		
disorder		
violent		

Appendix B: Coding Manual

PROCEDURAL AND CODING MANUAL FOR META-ANALYSIS OF THE LONG-TERM IMPACT OF YOUTH INTERVENTIONS ON ANTISOCIAL BEHAVIOR

Primary Investigator: Aaron M. Sawyer

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Complete one measure-level coding and effect size sheet for each antisocial behavior measure and informant.

STEP 1: SCREENING CRITERIA

Purpose: Screening is the first step in this study and determines which studies will be included in the meta-analysis. Our goal is to include the maximum number of studies available from our search sources. All studies will be coded according to the criteria below. Studies approved for a given criterion receive an “A”, and those that do not meet a given criterion receive an “X”. For each “X”, briefly describe the reason for exclusion on the screening form. All studies must be approved by one RA and the primary investigator for inclusion. Where discrepancies exist, we will discuss them until we reach a mutual agreement regarding whether or not the study should be included. Studies that receive all As will be subjected to further coding. Studies that receive at least one X will be excluded from further coding.

1. PSYCHOSOCIAL INTERVENTION

- A = Intervention of interest is a therapeutic or preventive intervention that attempts to improve youth outcomes or reduce youth problem behavior via social means. This includes educational programs, therapy or counseling, parent or teacher training, after-school programs, childcare programs, residential treatment or incarceration, foster care programs, community interventions, school or classroom interventions, tutoring, etc,. The common characteristic among these “psychosocial interventions” is that they intervene using interactions between people, rather than through the use of substances (e.g., nutrition, medication) or medical procedures (e.g., lobotomy, electroshock). Studies using a combined medication/nutrition plus psychosocial intervention are to be included.
- X = No psychosocial treatment condition. The study has no psychosocial intervention condition and will be excluded from all analyses. Examples of excluded interventions include medication-only and nutrition-only.

2. YOUTH PARTICIPANTS OR YOUTH TARGETS OF INTERVENTION

- A = Intervention of interest targets youth participants, where “youths” are defined as individuals in grade 12 or lower, or less than 18.0 years of age (i.e., < 18.0 years, but not = 18.0 years), on average, at the time of intervention. Note that these individuals may be adults at the time of follow-up. Youths do not have to be actively involved in treatment, as is the case with some parent training or prenatal education programs. In most cases, if the study is described as a youth, infant, child, adolescent, or juvenile intervention, then this criteria will be met. Some studies may list grade-level rather than age. As a general rule, any samples listed by grade-level should be included, unless the sample includes individuals in college.

An additional criteria here is that youth participants are not psychotic, not moderately to profoundly retarded (i.e., IQ below 55), and not autistic (i.e., meet criteria for autism or pervasive developmental disorder, NOS).

- X = No youth participants or youth targets of intervention. Studies that target adults for intervention should be excluded. Examples of excluded samples will include individuals in college and incarcerated adults.

3. CONTROL OR COMPARISON CONDITION

- A = The study design is prospective and includes some form of intervention condition that is separate from the intervention of interest (i.e., a control or comparison condition). Importantly, the control or comparison condition must last the entire length of the follow-up period. Approved control or comparison conditions include another alternative intervention, treatment as usual, no intervention control, placebo, medication, waitlist (but note length of wait for waitlist), etc. Participants need not be randomly assigned to control or comparison conditions for the study to be included.
- X = Study design includes no control or comparison condition, or the control or comparison condition does not last the entire length of follow-up. A primary example of the latter will be an x -month waitlist, where x is less than 12 months from the end of intervention until follow-up. In addition, retrospective designs in which a comparison sample is selected after intervention is over should be excluded. These include benchmarking studies and studies in which a sample of delinquent youths is selected after intervention to compare levels of problem behaviors.

4. FOLLOW-UP \geq 12 MONTHS AFTER INTERVENTION COMPLETION

- A = The study design includes a follow-up measurement that occurs an average of 12.0 months or more after the completion of the intervention. Note that some studies will measure length of follow-up from the start of treatment – in this case, it is necessary to calculate the described length of follow-up minus the average length of intervention. Where average length of intervention is not included, assume 9 months for a school year and 6 months for non-school-based interventions. If some form of booster session is used at a later date, do not measure length of follow-up from booster session – measure follow-up from the end of the larger intervention.
- X = The length of follow-up is shorter than 12 months or 1 year after the completion of intervention.

5. ANTISOCIAL BEHAVIOR OUTCOME

- A = The study must include at least one measure of antisocial behavior problem outcomes for target youths. Note that the target youths may be adults at the time of follow-up. Antisocial behavior outcomes include the following: crime, arrest, delinquency, aggressive behavior, disruptive behavior, conduct disorder symptoms, oppositional defiant disorder symptoms, externalizing behavior problems, deviant sexual behavior (e.g., juvenile sex offenses), and behavior problems in general. Drug/alcohol/substance use is recorded as an antisocial behavior outcome only if it is part of a larger measure of antisocial behavior (e.g., Self-Report Delinquency Questionnaire). Attention problems/ADHD symptoms are recorded as an antisocial behavior outcome only if it is part of a larger measure of antisocial behavior (e.g., Child Behavior Checklist, Youth Self-Report). It is not important who fills out the measure (e.g., parent, teacher, youth), and many studies will include multiple measures – the important criterion here is that the study includes at least one measure of antisocial behavior that is not strictly limited to substance use or attention problems.
- X = Study includes no measure of antisocial behavior or includes only measures strictly limited to attention problems or substance use. Studies that include only academic performance (e.g., grades, test scores) should also be excluded.

SCREENING SHEET

REFERENCE:		
<u>CRITERION</u>	<u>A/X</u>	<u>IF X, REASON</u>
1. Psychosocial Intervention		
2. Youth Participant/Target		
3. Control/Comparison		
4. Follow-up \geq 12.0 Months		
5. Antisocial Outcome		

*If A marked for all Criterion, continue to Step 2: Study Coding

STEP 2: STUDY-LEVEL CODING

Purpose: The second step of meta-analysis involves identifying important characteristics of participants, interventions, and study design that may be related to the size and direction of intervention effects. Ideally, we will have a numerical code for each study for each category below. In some cases, however, this information may not be available within the research paper and will have to be located in an older study (i.e., the first in a series of intervention studies) or by contacting the author of the study. In the event that there are multiple follow-ups for the same sample, we will use the longest follow-up available to date. All of this information will be logged into a computer file for later analyses.

1. PARTICIPANT CHARACTERISTICS

- a. Youth age
- b. Who participates
- c. Youth gender
- d. Youth ethnicity
- e. Problem severity

2. INTERVENTION CHARACTERISTICS

- a. Type
- b. Setting
- c. Format
- d. Hours intervention
- e. Duration of intervention
- f. Booster sessions
- g. Homework
- h. Intervention provider occupation
- i. Theoretical background

3. STUDY DESIGN CHARACTERISTICS

- a. Length of follow-up
- b. Sample recruitment
- c. Assignment to intervention conditions
- d. Type of control/comparison group

1. PARTICIPANT CHARACTERISTICS

a. Youth age

##.## Average age of youth participants at the start of intervention/recruitment should be coded in years to two decimal places. For studies that report age in days or months, convert age to years (Years = Days/365 or Months/12). For interventions targeting newborns or prenatal care, enter 0.00. For studies that give only grade-level information, assume 4.00 years for preschool, 5.00 years for kindergarten, 6.00 years for 1st grade, and so on up to 18.00 years for 12th grade.

b. Who participates

Code according to whomever participates actively in the intervention, except intervention administrators. By active participation, I mean those individuals who attend at least one intervention session and who are targets of intervention.

999	Missing/Unknown
10	Single child only
20	Mother only
30	Father only
40	Both parents, if available. This indicates that multiple parents are involved whenever possible, although only one parent may participate for families in which there is only one parent available.
50	Whole Family
60	Child and siblings
70	Whole classroom
80	Group of peers
90	Group of parents
100	Child and one parent
110	Child and both parents
200	Other: please describe

c. Youth gender

% Code according to percent male children to two decimal places. If not provided, follow these guidelines: Marginal/Few = 15%, Some = 30%, Majority = 60%, Mainly/Predominantly/Primarily = 90%.

d. Youth ethnicity

Code according to percentage of sample belonging to the ethnic groups below. If no information regarding sample ethnicity is known, code as 100% unknown. If proportions are described in qualitative terms, use the following guidelines: Marginal/Few = 15%, Some = 30%, Majority = 60%, Mainly/Predominantly/Primarily = 90%. Use “other” if provided an ethnic descriptor besides those below (e.g., if authors provide only % white and % nonwhite, enter the % nonwhite under “other” and write in “nonwhite”). For international studies, remove the “American”.

- % Caucasian/white/European American
- % African American or black Caribbean American
- % Latino/Hispanic American
- % Asian/Pacific Islander American
- % Native American
- % Other/Multi-ethnic/Non-specific minority (specify _____)
- % Unknown

e. Problem severity

Code severity according to the average pre-existing risk level or severity of problem behaviors exhibited by the participants as a whole.

- 999 Missing/Unknown
- 10 *Community sample.* Sample as a whole is not at particularly high risk for problems or currently exhibiting high levels of any particular problem.
- 20 *At-risk/High-risk sample.* Sample as a whole is at greater than average risk for psychosocial problems (e.g., by virtue of being poor or having teenaged parents) but is not currently exhibiting notable levels of problems. This is generally the case with selected preventive interventions (e.g., nurse home visits, Head Start)
- 30 *Subclinical problems.* Sample is referred or selected based on above-average levels of psychosocial problems (e.g., scored above some threshold on a measure of antisocial behavior, were referred by teachers based on high levels of aggression). However, problems levels fall short of clinical diagnosis (e.g., ADHD, ODD, Conduct Disorder, Substance dependence) or having been arrested for criminal activity.
- 40 *Severe/clinical problems.* Sample displays diagnosable levels of problems behaviors or are being seen in a clinical setting via normal seeking out of services. Alternatively, youths who have been arrested, incarcerated, or removed from their homes due to emotional or behavioral problems would fall in this category.

2. INTERVENTION CHARACTERISTICS

a. Intervention type

Code for the type of intervention according to the following general distinctions made in the research literature (see Weisz, Sandler, Durlak, & Anton, 2005, *American Psychologist*).

- 10 *Health promotion/Positive development* – Intervention proposes to enhance positive development, rather than prevent or alleviate some sort of problem. These interventions are generally administered on a large-scale to a community population.
- 20 *Universal/Primary prevention* – Intervention proposes to prevent future problems in a large, community population, rather than prevent problems in a sample that is especially at risk for developing problems or already exhibiting problems. Many substance abuse prevention fit this model (e.g., D.A.R.E).
- 30 *Selective prevention* – Intervention proposes to prevent future problems in a sample that is at above-average risk for some problem, generally due to some broad risk factor (e.g., poverty, teenage mother, parental incarceration). However, the sample is not selected based on having above-average levels of existing problem behaviors.
- 40 *Indicated prevention* – Intervention proposes to prevent future problems in a sample that is already exhibiting above-average levels of problems but that has not yet reached a “clinical” level of severity (e.g., fits a diagnosis, has been incarcerated or arrested).
- 50 *Time-limited/Brief therapy* – Intervention is designed to reduce existing high levels of problems, which approximate the severe/clinical level of problem severity. Intervention involves regular meetings over a period of several weeks to several months.
- 60 *Intensive/Enhanced therapy* – Intervention is designed to reduce existing high levels of problems, which approximate the severe/clinical level of problem severity. Intervention involves high frequency of treatment meetings (e.g., more than one meeting per week) and/or longer duration of treatment (e.g., greater than 3 months). This designation would include both day treatment programs and intensive family therapy programs, such as multisystemic therapy (MST) or multidimensional treatment foster care (MDFC).
- 70 *Residential treatment* – Intervention is designed to reduce high levels of problems via out-of-home placements where youths live for some period of time. This would include inpatient hospitalization, juvenile detention, residential psychiatric facility, etc.
- 80 *Continuing care* – Intervention is designed to monitor ongoing youth problems or provide ongoing supports after some more intensive intervention has been tried or after a significant problem has arisen (e.g., arrest). This would include juvenile probation programs that do not include formal intervention or treatment as well as many programs that can be described as after-care.
- 90 *Multicomponent intervention* – Intervention includes different components that match the above types (specify _____). For instance, a broad intervention may contain a selective prevention component for at-risk youths and a more intensive indicated prevention component for youths deemed at higher risk. Alternatively, a residential treatment may include therapy programming while youths are at the site as well as continuing care or therapy after the individual is released.

b. Setting

Code for the place in which intervention occurs. That is, where do intervention session/meeting occur? For interventions that involve multiple locations, use the “Multiple settings” code and note where they occur (e.g., home and school).

- 999 Missing/Unknown
- 10 School
- 20 Office-setting/clinic
- 30 Community center/neighborhood agency
- 40 Home
- 50 Day treatment program (like residential but target returns home for night)
- 60 Juvenile justice office (nonresidential)
- 70 Residential juvenile detention facility (e.g., boys’ home, detention center)
- 80 Residential or inpatient treatment facility (e.g., psychiatric hospital)
- 90 Medical hospital
- 100 Multiple settings (specify _____)
- 150 Other single setting (specify _____)

c. Format

Code for how intervention is administered in terms of who and how many target individuals participate.

- 999 *Unknown/missing*
- 10 *Individual* – Intervention meetings involve only one target individual or parent
- 20 *Family* – Intervention involves more than one member of the same family
- 30 *Group* - Intervention involves two or more target individuals or families
- 40 *Mixed* – Intervention involves meetings in multiple, different formats (specify _____)

d. Hours intervention

999 Missing/unknown

##.## Average number of hours of formal intervention (i.e., time spent in intervention meetings/sessions). If an average number of meetings or sessions is given, assume that each meeting/session is equal to 1.00 hour.

e. Weeks of intervention

999 Missing/unknown

##.## Average number of weeks of intervention from start to finish, not including any booster sessions that may have occurred. Convert months to weeks by assuming 4 weeks to a month. Assume that the length of a school-year-long intervention is 9 months, and do not include summer in multi-year school-based intervention unless it is explicitly mentioned that intervention continued through the summer months.

f. Booster sessions

00 No, booster sessions were not used or mentioned

10 Yes, booster sessions occurred after the formal intervention period ended. Generally, these will be in the form of a brief period of intervention several months after the main intervention period has ended.

g. Homework

Code for whether or not some form of homework assignments or activities outside of intervention sessions were used as a part of the intervention.

0 *No* – Homework or outside activities not mentioned (it is unlikely that researchers will explicitly state that no homework was used).

10 *Yes* - Target homework was part of intervention protocol. Code yes if authors describe assigning, instructing, encouraging, or urging subjects to do out-of-session practice, behavior tracking/charting, reward implementation, written assignment, taking medication, following a diet, etc. The important thing is that activities are prescribed or encouraged outside of formal intervention sessions/meeting.

h. Intervention provider occupation

Code for the occupation of the intervention provider in terms of the main person or people responsible for administering intervention sessions.

- 999 Missing/unknown
- 10 Teacher
- 20 Therapist/counselor, someone with formal training in a mental health or school counseling-related field
- 30 Social worker
- 40 Nurse
- 50 Juvenile justice personnel
- 60 Graduate student
- 70 Undergraduate student
- 100 Other (specify _____)

*For purposes of analysis, intervention providers were later grouped into researchers (i.e., academic faculty or graduate students), professionals (i.e., those with professional training in a mental-health related field, such as social workers or therapists), or paraprofessionals (i.e., those with limited or no formal training in mental-health work, such as teachers, nurses, or juvenile justice personnel).

i. Theoretical background

Code for the theoretical orientation of the intervention in terms of some basic categories, as described below.

- 10 *Child-focused, learning-based intervention* – Intervention has components based on behavioral or cognitive learning principles and where learning is a primary mechanism through which change is hypothesized to occur. This code is reserved for interventions that involve some direct work with the child. This may include various reinforcement techniques for desirable/good behavior (e.g., points, tokens), relaxation, modeling, social skills training, child cognitive-behavioral therapy/CBT, role playing, etc. In these intervention, the child is generally asked to do something different or be active in changing his/her own behavior.
- 20 *Child-focused, insight-based interventions* – Intervention has components based on non-behavioral psychological principles and where insight is a key mechanism through which change is hypothesized to occur. This code is reserved for interventions that involve some direct work with the child. This may include child client-centered therapy, nondirective intervention, any type of psychodynamic intervention, child Gestalt interventions, emotion-focused interventions (i.e., discussing feelings without linking emotions to behaviors), most types of youth support groups, and interpersonal therapy.
- 30 *Parent-/family-/system-based interventions* – Intervention has components based on parent training or family systems principles and where change in family interactions or parenting behavior is a primary mechanism through which change occurs. This code is reserved for interventions that involve direct work with family members of target youths and may or may not include the youth him/herself. This may include interventions labeled as family therapy, parent training, parent-child interaction training, or multi-component treatments that focus primarily on family functioning (e.g., Multisystemic Therapy/MST, Multidimensional Treatment Foster Care/MDFC)
- 40 *Eclectic/vague/combo interventions* – Intervention has major components from multiple of the above categories or is too poorly described to warrant a more precise code. This may include many multi-component interventions that involve some parent-training work and some individual youth intervention (e.g., therapy or group/classroom intervention).

3. STUDY DESIGN CHARACTERISTICS

a. Length of follow-up

Average length of follow-up in years as measured from the end of intervention (excluding booster sessions) through follow-up assessment time point. In some cases, authors will report follow-up length as being from the start of intervention through follow-up assessment. In this instance, estimate length of follow-up by subtracting out the average length of intervention. Unless otherwise mentioned, interventions that take place over the course of a school year can be considered 9 months, or .75 years long. Convert days or months of follow-up to years (Days/365 or Months/12). For interventions targeting newborns or prenatal care, follow-up length is simply the average age of the target youths at follow-up in years.

b. Sample recruitment

Code for the means by which the target intervention participants were acquired for study. When drawn from multiple populations, code for the least severe, least restrictive.

999 *Missing/unknown*

10 *Community sample* – Recruited from those not seeking or receiving intervention independent of the study (e.g., an entire school). In other words, they would not have received intervention had it not been for the study. Also include participants who were recruited via advertisements.

20 *Screen/Nomination sample* – Recruited through a large-scale screening process or by teacher or peer nominations of the most troubled youths. Typically, large-scale screening processes using some formal measure of problems will select out those youths who score above a certain threshold for intervention.

30 *Educational/school psychology sample* – Recruited from existing school-based intervention populations (e.g., special education, emotionally disturbed, alternative schools for high-risk youth, students with an individual education plan/IEP).

40 *Outpatient sample* – Recruited from existing mental health outpatient population (e.g., community mental health center, specialty clinic, university-based clinic). The participant came from regular service channels for intervention (i.e., were seeking services anyway, rather than recruited explicitly for a research study)

50 *Inpatient/residential sample* – Recruited from existing mental health inpatient or residential service population (e.g., psychiatric hospital). Note that this does not include residential juvenile justice settings (e.g., juvenile detention center)

60 *Court-ordered therapy sample* – Recruited from participants who were court-mandated through juvenile justice system or Division of Child and Family Services (or similar agencies, which vary in name according to state).

70 *Incarcerated sample* – Recruited from participants who were residing in juvenile detention facility, boys' home, girls' home, etc. Participants were in residential facility explicitly for juvenile delinquency or criminal behavior but not other types of mental health problems (e.g., suicidality, depression, psychosis).

100 *Other* (please specify _____)

c. Assignment to intervention conditions

Code for means by which participants were assigned to intervention conditions.

999 *Missing/unknown*

10 *Nonrandom/Nonmatched.* Participants were assigned to intervention conditions without randomization, and participants were not purposely matched based on demographic characteristics (e.g., race, gender) or levels of pre-existing problems.

20 *Matched design.* Participants in intervention conditions were matched based on one or more characteristics (e.g, race, gender, age, pre-existing problems) in order to make participants similar to one another across conditions.

30 *Randomized design.* Participants were assigned to intervention conditions based on some type of randomized process (e.g., coin flip, random numbers table, computer randomization program, etc.). This also includes the common case of classrooms being randomly assigned. Designs that are both randomized and matched would also fall in this category.

d. Type of control/comparison intervention

Code for the type of intervention to which the target intervention is being compared. For studies with multiple control/comparison

00 *No intervention/waitlist control.* No intervention by the researchers during the follow-up period, or participants were asked to be on a waitlist to receive the target intervention at a later time.

10 *Attention placebo.* Participants received some type of attention from the researchers/intervention providers that was designed to control for nonspecific/general therapy processes, such as receiving attention, tutoring, or talking about problems with a non-professional. The defining characteristics here are that the participants receive something that is not designed to be an intervention but does provide some level of attention to the participants.

20 *Treatment as usual/Usual care.* Participants received whatever interventions were normally administered to those with similar types of levels of presenting problems in the community in which the intervention occurred.

30 *Alternative intervention of interest.* Participants received another intervention that is considered to have some level of evidentiary support, or they received another variant of the primary treatment (e.g., Target treatment X with a family component)

STEP 3: MEASURE-LEVEL CODING & CALCULATING EFFECT SIZES

General Instructions: You will complete one effect size sheet for *each measure and informant* at follow-up. This may result in several effect sizes for each study. The purpose of calculating multiple effect sizes is to try to compare different studies on different types of measures and different informants. To reduce statistical dependency of measures, we will use the broadest measure for each type of assessment that is specific to antisocial behavior.

For instance, if a measure of arrests is provided, we will use only the broadest measure of arrests (i.e., total number of arrests, or overall recidivism rate), rather than calculating effect sizes for different types of arrest (e.g., number of violent offense arrests). However, it is also the case that we wish to use measures specific to antisocial behavior, so subscales pertaining to antisocial behavior (e.g., the Externalizing subscale of the Child Behavior Checklist) will be used when a broader measure of psychosocial functioning is given. Remember, if a measure is not specific to antisocial behavior, we will not use it to calculate effect sizes.

Name of measure (including subscale name if necessary): _____

Type of antisocial behavior measured (e.g., criminal arrests, aggression, etc.): _____

a. Informant

Code for who is providing the assessment information.

- 10 Official record
- 20 Youth self-report
- 30 Parent-report
- 40 Teacher-report
- 50 Other (please specify _____)

b. Method of follow-up

Code for the way in which follow-up assessment information was collected.

- 10 Official records only (e.g., state, federal, or juvenile criminal records)
- 20 No or minimal personal contact (e.g., via mail, phone, or on-line; alternatively, if informants were simply given a checklist to fill out)
- 30 In-person interviews
- 40 Direct observation of youth behavior or family interaction

c. Standardized measure

Code for whether the measure is standardized (i.e., it has been evaluated for reliability and validity in some other study) or whether it is a measure designed for the purposes of a particular study. Standardized measures will generally be referred to as such in the method section and will reference an manual or peer-reviewed source for the measure. For our purposes, consider official arrest records to be standardized.

999	Missing/unknown
00	Not standardized
10	Standardized

d. Given statistical information for effect size

For our purposes, an effect size is a statistical measure of the size and direction of the effect of an intervention as evaluated by comparing values on outcome measures between intervention groups. Record the type of effect size given by the authors, if available, and its value. Common types of effect size include Cohen's *d*, Glass's delta, eta, some type of correlation coefficient (generally labeled as *r* or sometimes R-squared), hazard ratios, or odds ratio.

Many older studies (e.g., pre-1990) will not include a measure of effect size. In this case, record whatever information is available regarding mean outcome scores ($M = \#\#. \#\#$) and standard deviations ($SD = \#\#. \#\#$) for intervention and control/comparison groups.

Also record, the sample size of the intervention (n_{int}) and control (n_{con}) groups for each outcome variable here as well as the total sample size (N).

Table 1

Intercoder Reliability Estimates for Participant, Intervention, and Methodological Characteristics

Variable	Reliability Statistic	Coefficient Value
Participant characteristics		
Baseline age	ICC	1.000
Percent male	ICC	.987
Percent minority	ICC	.965
Intervention characteristics		
Intervention type	ICC	1.000
Intervention format	ICC	.879
Booster Session	Kappa	1.000
Homework	Kappa	.872
Weeks of Intervention	ICC	.999
Hours of Intervention	ICC	.971
Theoretical Background	ICC	.976
Provider Occupation	ICC	.988
Methodological characteristics		
Follow-up length	ICC	1.000
Percent attrition	ICC	.931
Random assignment	Kappa	.934

Note: ICC = intraclass correlation. Kappa = Cohen's kappa. Reliability analyses based on correspondence between first author as rater and research assistants for 28.78% of study sample (i.e., 19 or 66 studies).

Table 2

Follow-up Study Characteristics and Mean Effect Size Values

Trial	Intervention	Baseline Participant Age (Years)	Length of Follow-Up (Years)	N at Follow-Up	Adjusted Mean Effect Size by Data Source					Average
					Official	Youth	Parent	Teacher	Other	
Alexander & Parsons (1973)	Functional Family Therapy (FFT)	14.50	1.00	86	0.68					0.68
Arbuthnot & Gordon (1986)	moral reasoning development program	14.54	1.00	22	0.00			0.33		0.17
Bernat et al. (2007)	Early Risers	5.00	3.00	151		0.28	0.22			0.25
Black et al. (2007)	home visiting among infants with failure to thrive	1.09	5.91	96			0.35	0.25		0.30
Boisjoli et al. (2007)	multicomponent preventive intervention	7.00	13.00	250	0.30					0.30
Borduin et al. (2009)	Multisystemic Therapy for Problem Sexual Behaviors (MST-PSB)	14.00	8.90	48	0.61					0.61
Brody et al. (2008)	Strong African American Families Program	11.20	2.30	482		0.62				0.62
Brotman et al. (2008)	modified Incredible Years	3.96	1.33	71			-0.34		2.80	1.23
Bry (1982)	school-based preventive intervention	12.50	5.00	60	0.73					0.73
Caldwell & Van Rybroek (2001)	decompression treatment	N/A	1.46	20	1.61					1.61
Carpentier et al. (2006)	Group cognitive-behavioral therapy for sexual behavior problems	8.45	11.45	135	1.06					1.06
Catalano et al. (1999)	Focus on Families (FOF)	10.40	1.00	100		0.15				0.15

(table continues)

Chamberlain et al. (2007)	Multidimensional Treatment Foster Care (MTFC)	15.00	1.50	67	0.39	0.06			0.23
Cox (1999)	alternative education program	13.00	1.00	83			-0.22		-0.22
Dishion & Andrews (1995)	Adolescent Transitions Project (ATP, parent + teen focus condition)	12.00	1.00	53			0.06	-0.22	-0.08
Eckenrode et al. (2010)	Nurse-Family Partnership (NFP)	0.00	17.00	231		0.51			0.51
Eddy et al. (2004)	Multidimensional Treatment Foster Care (MTFC)	14.90	1.00	79	0.44	0.76			0.60
Eddy et al. (2003)	Linking the Interests of Families and Teachers (LIFT)	10.55	3.00	361	0.35				0.35
Elliot et al. (2002)	Parenting Preschoolers Programme (Triple P, combined condition)	4.75	2.00	114			0.03	0.40	0.21
Elrod & Minor (1992)	multi-faceted intervention for juvenile court probationers	14.80	2.00	43	-0.04				-0.04
Forgatch et al. (2009)	Oregon model of parent management training	7.80	8.73	238	0.28				0.28
Gordon et al. (1995)	Functional Family Therapy (FFT)	15.40	4.75	45	0.67				0.67
Gross et al. (2009)	Chicago Parent Program	3.00	1.00	253			0.14	0.45	0.29
Guerra & Slaby (1990)	Cognitive Mediation Training (CMT)	17.17	1.50	53	0.26				0.26
Henggeler et al. (1997)	Multisystemic Therapy (MST)	15.22	1.37	140	0.59				0.59
Henggeler et al. (1993)	Multisystemic Therapy (MST)	15.12	2.10	84	0.51				0.51
Jesness (1975)	behavior modification	16.00	2.00	913	-0.01				-0.01
Johnson & Walker (1987)	Houston Parent-Child Development Center	1.00	6.50	139				0.46	0.46
Jouriles et al. (2009)	Project Support	6.50	1.00	56			0.64		0.64

(table continues)

Kam et al. (2004)	Promoting Alternative THinking Strategies (PATHS)	8.75	2.00	93			0.18	0.18
Kazdin et al. (1989)	Problem-Solving Skills Training (PSST)	11.00	1.00	53		0.36	0.37	0.36
Kazdin et al. (1987)	Problem-Solving Skills Training (PSST)	10.90	1.00	33		1.29	0.87	1.08
Kitzman et al. (2010)	Nurse-Family Partnership (NFP)	0.00	10.00	613				-0.03
Kolko et al. (2009)	community-based modular treatment	8.80	3.00	129	0.20	0.20	0.07	0.16
Kratochwill et al. (2009)	Families and Schools Together (FAST)	6.00	1.00	78	0.00	0.69	-0.17	0.17
Lally et al. (1988)	Syracuse University Family Development Research Program	0.00	5.00	119	0.81			0.81
Lavigne et al. (2008)	Incredible Years	4.50	1.00	99		0.08		0.08
Lee & Olejnik (1981)	Project CREST (Clinical Regional Support Teams)	15.35	1.78	61	0.57			0.57
Liddle et al. (2001)	Multidimensional Family Therapy (MDFT)	15.90	1.00	77		0.36		0.36
Lochman (1992)	anger coping (AC)	10.00	3.00	83	0.11			-0.22
Lochman & Wells (2004)	Coping Power Program	10.00	1.00	86	0.00		0.41	0.21
Mann & Reynolds (2006)	Chicago Longitudinal Study - preschool intervention	4.00	9.00	1,406	0.38			0.38
McCord (1978)	Cambridge-Somerville youth Study	10.50	30.00	506	-0.08			-0.08
McDonald et al. (2006)	Project Support	20.00	2.00	30		0.69		0.69
Miller-Heyl et al. (1998)	DARE to be You	3.50	1.81	187		0.08		0.08
Muratori et al. (2003)	time-limited psychodynamic psychotherapy	8.80	1.79	56		0.58		0.58
Myers et al. (2000)	Project Back-on-Track	14.60	1.00	60	0.98			0.98

(table continues)

Olds et al. (2004)	Nurse-Family Partnership (NFP)	0.00	2.00	407		0.01			0.01
Rey et al. (1998)	multi modal day program	12.95	3.00	72		-0.06			-0.06
Rohde et al. (2004)	Adolescent Coping With Depression (CWD-A)	15.10	1.00	87	0.05	-0.52			-0.23
Sarason & Ganzer (1973)	modeling and group discussion	16.58	3.00	128	0.45				0.45
Sawyer & Borduin (2010)	Multisystemic Therapy (MST)	14.80	21.87	176	0.45				0.45
Schweinhart (2007)	High/Scope Perry Preschool Program	3.00	35.00	123	0.38				0.38
Sexton & Turner (2010)	Functional Family Therapy (FFT) [Community Practice, WA]	15.00	1.00	903	0.00				0.00
Shaw et al. (2006)	Family Check-Up	2.01	1.92	109		0.12			0.12
Shore & Massimo (1979)	comprehensive, vocationally oriented psychotherapy	16.00	15.00	20	0.66				0.66
Smolkowski et al. (2005)	Schools and Homes in Partnership (SHIP)	6.50	2.00	244		0.29	0.28	0.21	0.26
Stolberg & Mahler (1994)	Children's Support Group, (skill building + support condition)	9.80	1.00	43		-0.14	0.00		-0.07
Strayhorn & Weidman (1991)	Parent-Child Interaction Training (PCIT)	3.75	1.00	84		0.10	0.45		0.27
Szapocznik et al. (1989)	Structural Family Therapy (SFT)	9.00	1.00	37		0.16			0.16
Timmons-Mitchell et al. (2006)	Multisystemic Therapy (MST)	15.10	1.50	93	0.63				0.63
Toldson et al. (2006)	family process program	12.00	4.88	465		-0.36			-0.36
Verduyn et al. (2003)	group cognitive-behavioural therapy	3.10	1.00	71		0.31			0.31
Weis & Toolis (2009)	voluntary military-style residential treatment	17.00	3.00	232		0.26			0.26
Wilmshurst (2002)	family preservation program	11.12	1.00	69		0.06			0.06
Wodarski et al. (1979)	school-based social learning program	12.80	4.00	40	0.50				0.50

Table 3

Mean Effect Size Values by Data Source

Source	Studies	Adjusted Mean <i>d</i> (95% Confidence Interval)
Official records	29	.42 (.30 - .54)
Youth self-report	12	.26 (.10 - .43)
Parent report	28	.16 (.04 - .27)
Teacher report	14	.25 (.13 - .37)
Other report	5	.56 (-.01 - 1.15)
All sources, combined	66	.31 (.23 - .39)

Table 4

Means and Standard Deviations for Participant, Intervention, and Methodological Characteristics for Prevention and Therapy

Variable	Prevention		Therapy	
	M	SD	M	SD
Sample characteristics				
Baseline age (years)*	6.57	4.52	13.07	3.56
Gender (% male)	66.03	20.48	72.84	22.74
Ethnicity (% minority) [†]	53.72	36.28	39.59	24.15
Intervention characteristics				
Number of components	1.59	0.74	1.38	0.66
Dose of intervention (hours)	60.31	51.88	45.89	42.36
Length of intervention (weeks)**	64.00	79.39	18.01	8.79
Methodological characteristics				
Length of follow-up (years) [†]	5.54	7.84	2.72	3.20
Sample size (N)	155.41	95.50	92.22	70.15
Attrition (% lost to follow-up)**	22.02	15.17	10.15	11.01

Note: Outliers were trimmed to three standard deviations above variable mean for dose of intervention and sample size.

[†] $p < .10$, * $p < .05$, ** $p < .01$.

Table 5

Descriptive Statistics for Categorical Participant, Intervention, and Methodological Characteristics for Prevention and Therapy

Variable	Prevention	Therapy
Intervention Characteristics (%)		
Individual component ^{**}	5.9	31.3
Peer group component ^{**}	70.6	31.3
Parent group component [*]	44.1	18.8
Family component	41.2	56.3
Booster session [*]	20.6	3.1
Homework assignments	14.7	21.9
Researcher provider	16.7	31.3
Professional provider [†]	33.3	56.3
Paraprofessional provider ^{**}	73.3	40.6
Child-focused learning theory [†]	61.8	40.6
Systemic theory	41.2	50.0
Methodological Characteristics		
Random assignment [†]	91.3	78.1

Note: Numbers above represent % positive for characteristic.

[†] $p < .10$, ^{*} $p < .05$, ^{**} $p < .01$.

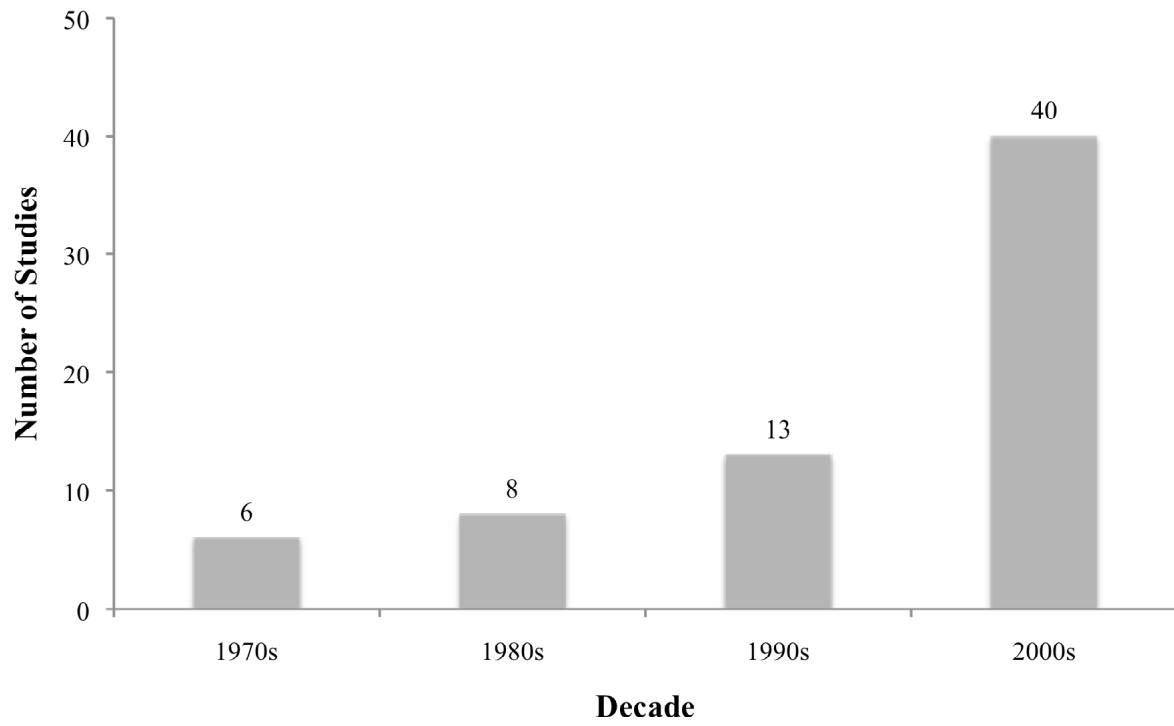


Figure 1: Number of long-term follow-up studies by decade.

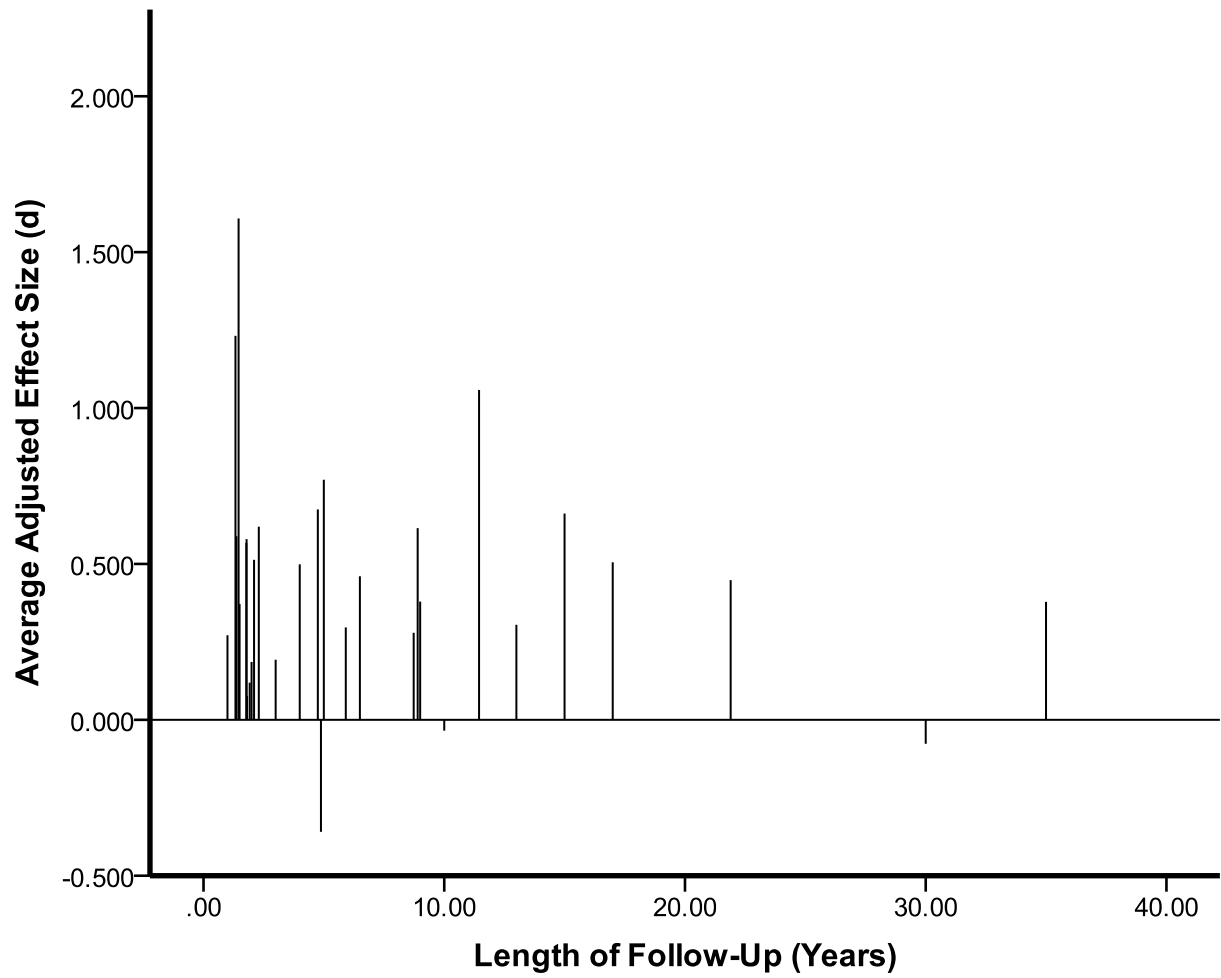


Figure 2: Average adjusted effect size by length of follow-up.

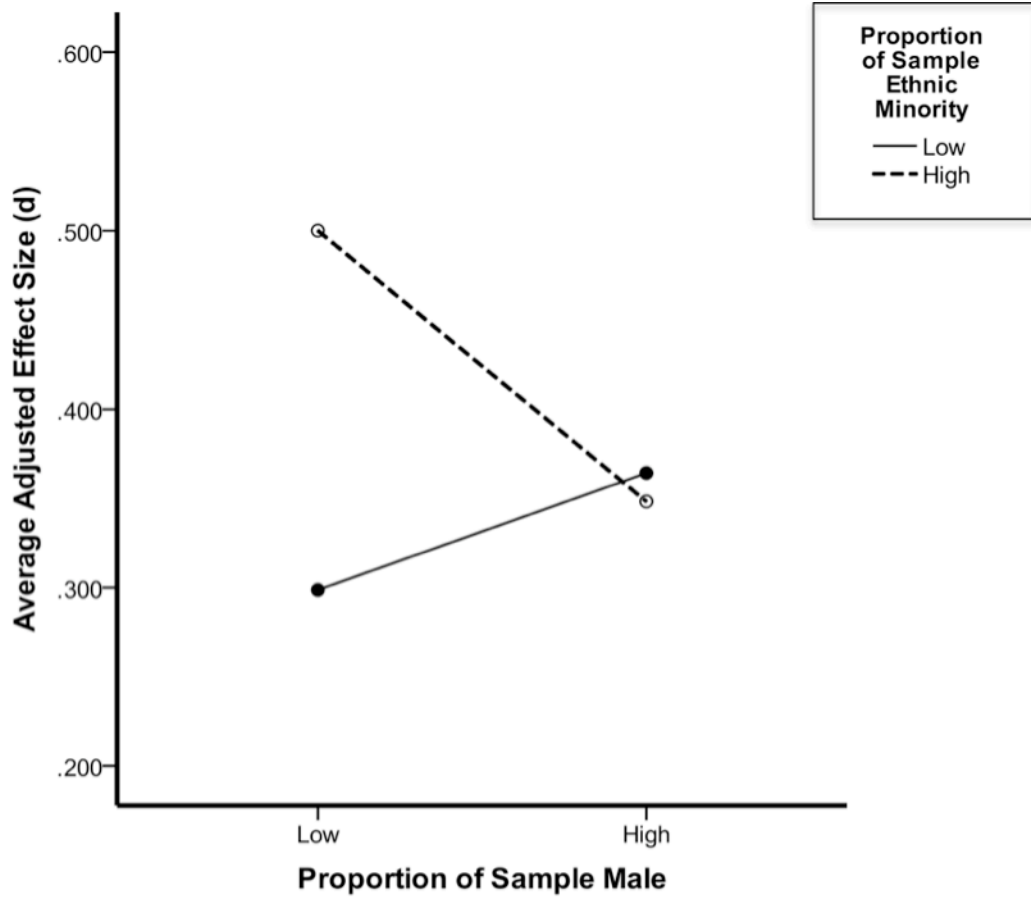


Figure 3: Gender by ethnicity interaction for study-level average adjusted effect size.

Note. Proportion of sample male and proportion of sample ethnic minority variables represent samples below (Low) and above (High) the mean for proportion male and proportion minority, respectively.

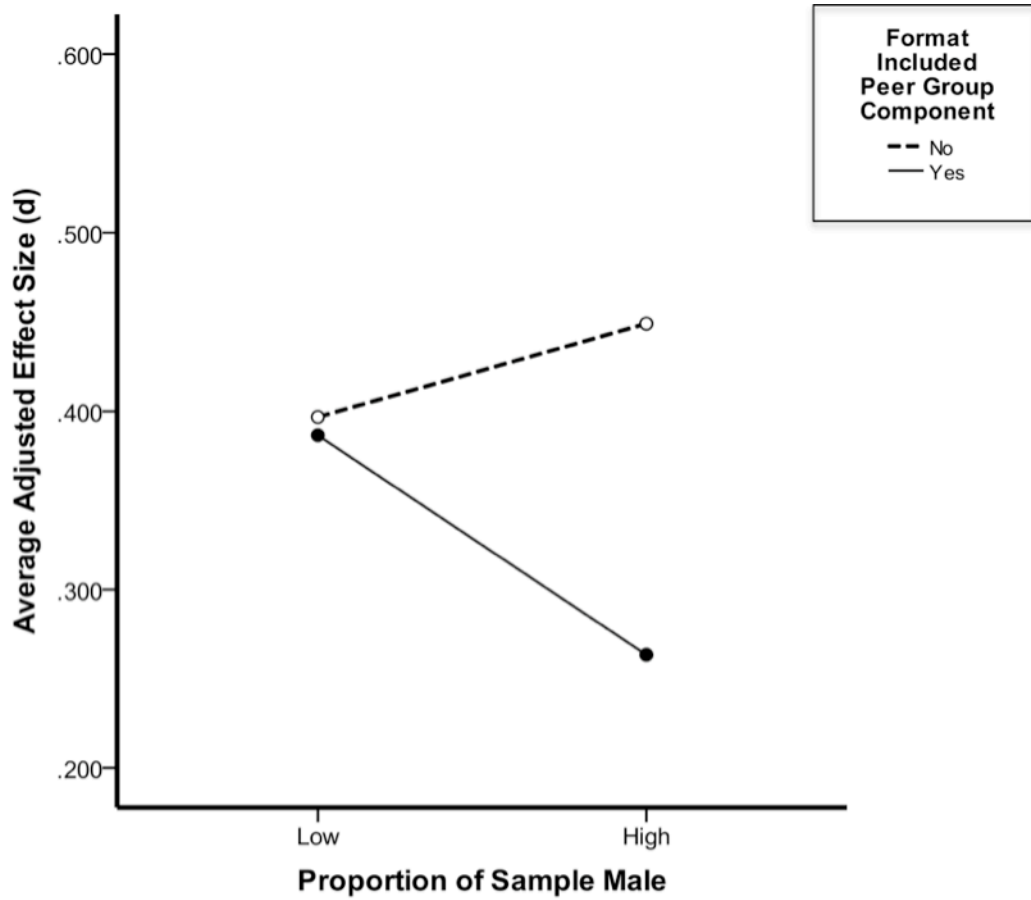


Figure 4: Gender by peer group format interaction for study-level average adjusted effect size.

Note. Proportion of sample male represents samples below (Low) and above (High) the mean for proportion male.

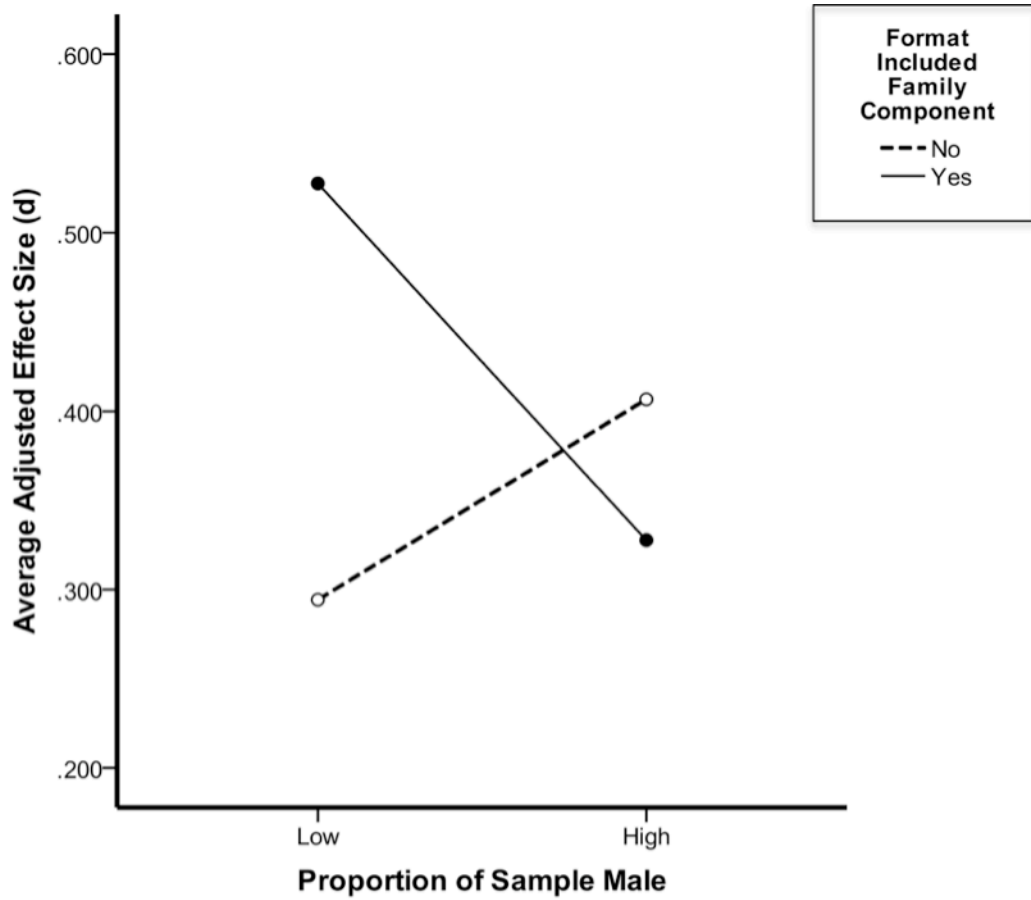


Figure 5: Gender by family format interaction for study-level average adjusted effect size.

Note. Proportion of sample male represents samples below (Low) and above (High) the mean for proportion male.

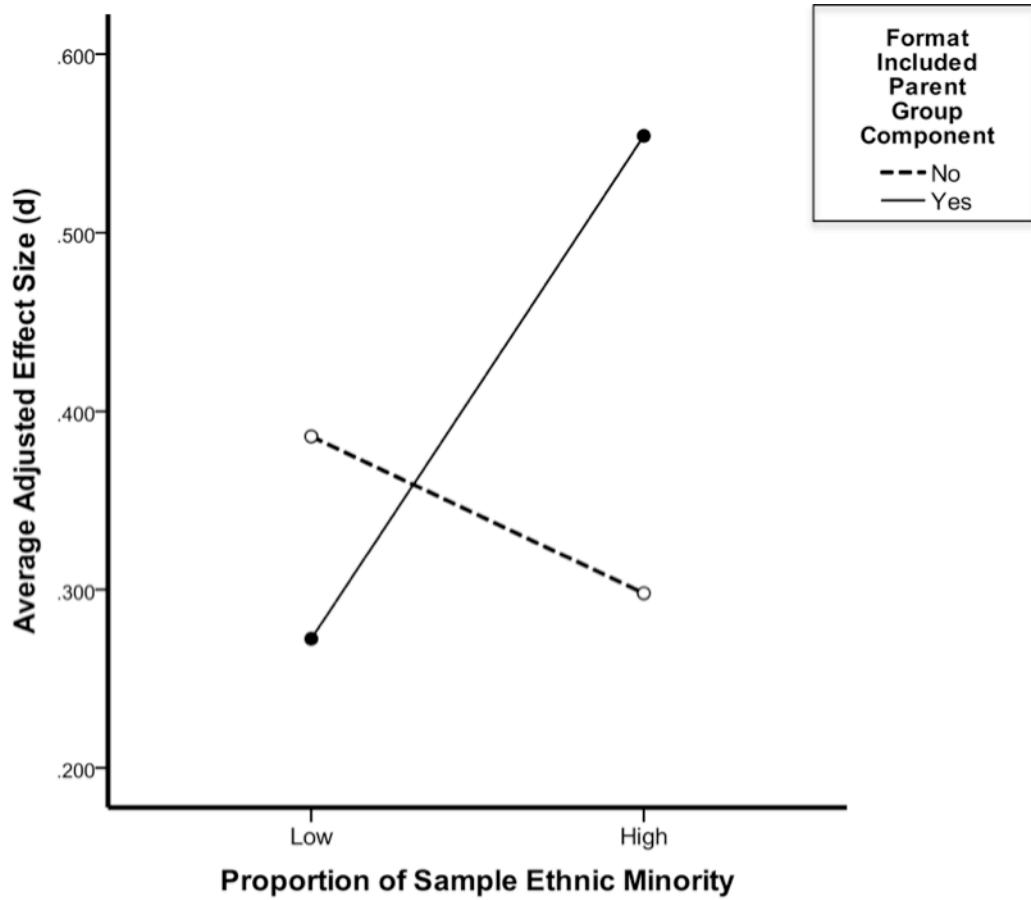


Figure 6: Ethnicity by family format interaction for study-level average adjusted effect size.

Note. Proportion of sample ethnic minority represents samples below (Low) and above (High) the mean for proportion ethnic minority.

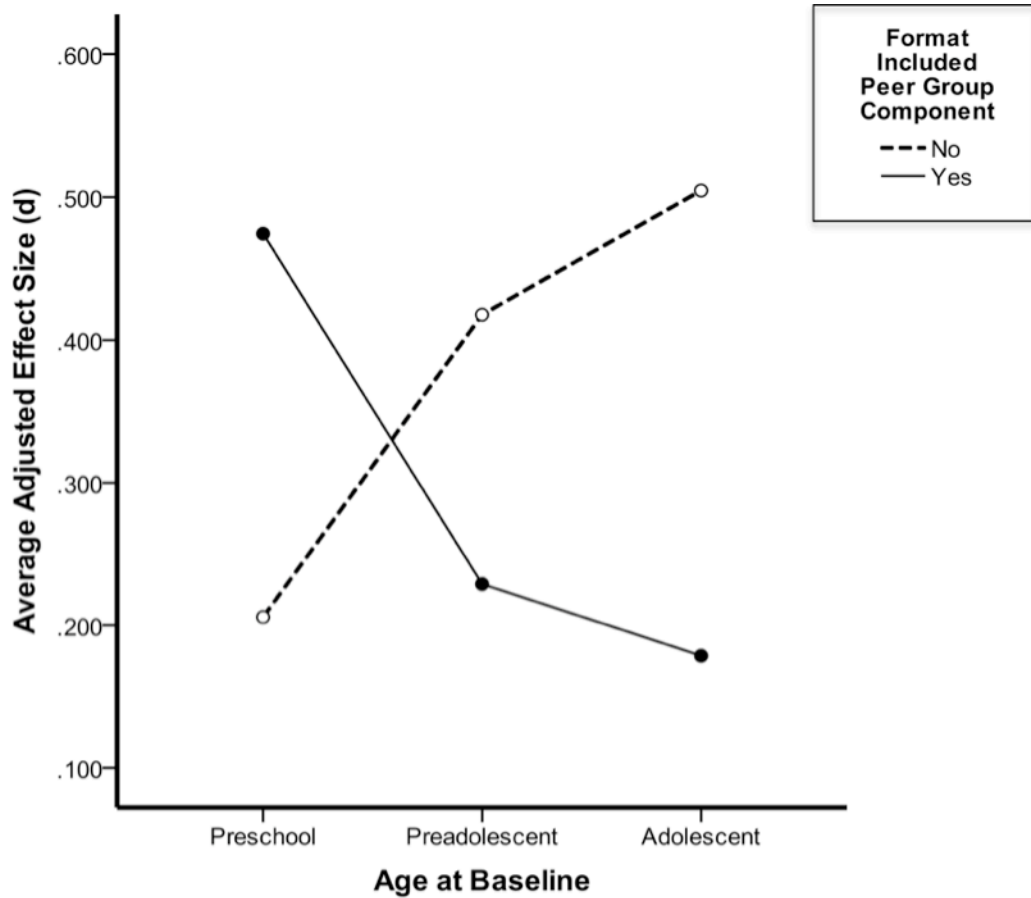


Figure 7: Age at baseline by peer group format interaction for study-level average adjusted effect size.

Note: Age at baseline categories are defined as follows: Prenatal to 5.99 years (Preschool), 6.00 to 12.99 years (Preadolescent), and 13.00 to 18.00 years (Adolescent).

VITA

Aaron M. Sawyer is currently a doctoral student at the University of Missouri-Columbia. He earned a B.S. in Psychology from Denison University in 2003 and an M.S. in Experimental Psychology from Western Washington University in 2005, as well as an M.A. in Clinical Psychology from the University of Missouri-Columbia in 2008. Aaron is currently living in York, Pennsylvania while completing his pre-doctoral internship at Pennsylvania Counseling Services (completion August 2012).

Aaron grew up in Warsaw, Indiana before matriculating to Denison University in Granville, Ohio in 1999. Following his freshman year of college, he began working at a psychiatric hospital serving children and adolescents. This work inspired him to pursue a career in clinical psychology, focused on identifying and disseminating empirically supported interventions for youths with serious emotional and behavioral problems. That focus eventually led to doctoral studies under University of Missouri professor Charles Borduin, one of the co-developers of multisystemic therapy, an empirically supported family treatment model for serious and violent juvenile offenders. While at University of Missouri, Aaron engaged in research, teaching, and clinical work focused on child development and family interventions.

Upon completion of his predoctoral internship and a postdoctoral fellowship at the Kennedy Krieger Center in Baltimore, Maryland, Aaron intends to pursue a career focused on promoting evidence-based treatments through, service system consultation, teaching, and research. Specific interests include underserved youth populations including juvenile delinquents, youths with severe psychiatric problems, and youths who have been exposed to child abuse and neglect.