

A Meta-Analysis of Aggressive Behavior Intervention Research

By

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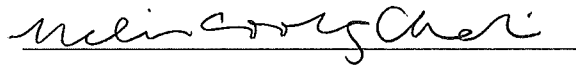
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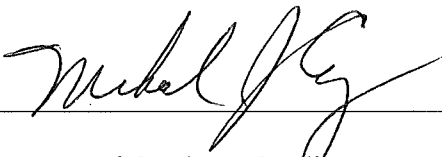
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# A Meta-Analysis of Aggressive Behavior Intervention Research

By

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The University of Wisconsin-Eau Claire, 2016  
Under the Supervision of Dr. Coolong-Chaffin

Physical aggression is a serious issue in public schools. Meta-analyses have suggested that school-based interventions are generally effective in reducing direct, physically aggressive behavior, but it has been several years since a meta-analysis has been conducted. The current meta-analysis adds to the existing literature by synthesizing the results of 20 outcome studies published since 2004. Overall, the effects of these interventions appear to be relatively small,  $d = .15$ . Interventions delivered by researchers tended to produce greater effects than those delivered by teachers. Likewise, interventions delivered with greater fidelity tended to produce greater effects than those interventions delivered with lower fidelity or not reporting any fidelity measurements. Results also indicate that “demonstration” and “research” programs are far more common than “routine” programs in the literature, and the outcomes that are reported are more likely to have greater effects than is typical in routine school practices. Future research should focus on evaluation of routine practices and include more commonly used data collection procedures such as office discipline referrals or incident reports.

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Date

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Youth violence and aggression are serious public health issues (Centers for Disease Control and Prevention [CDC], 2014). In 2013, 24.7% of students reported having been in a physical fight (CDC, 2014), and 8.1% of students reported having been in a fight on school grounds. Additionally, 3.1% of students report having sustained an injury in a physical fight which required medical treatment in the past 12 months (CDC, 2014). Recent school-associated violence has drawn attention to the need for programs and interventions intended to reduce this violence. Meta-analyses have suggested that these programs are generally effective in reducing aggressive behavior and its related outcomes (e.g., Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011; Hahn et al., 2007; Wilson & Lipsey, 2007).

With the exception of Wilson and Lipsey (2007), these meta-analyses include a broad range of measures (e.g., attitudes toward violence, self-report, suspension rates, measures of delinquency), some of which do not necessarily reflect the outcomes of strictly overt, physical aggression. That is, the meta-analyses include a wide range of behavior and outcomes under the term “aggression.” Verbal aggression, such as yelling, swearing, or threatening, and relational aggression, such as purposefully excluding another person or spreading rumors, are included with direct, physical aggression, such as hitting, kicking, or spitting. However, the interventions for physically aggressive behavior should be examined independently of “indirect” aggressive behavior (i.e., verbal or social).

It has been several years since a comprehensive review has been completed which focuses exclusively on outcomes related to overt physical aggression. The current meta-

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analysis updates the existing literature by including school-based intervention outcome studies published within the past 10 years. More specifically, the current meta-analysis is intended to address two research questions. First, what research has been conducted in the past ten years that examines the outcomes of school-based aggressive behavior interventions for elementary-aged students? Second, what are the effects of these interventions, and are these effects different when universal programs are compared based on characteristics such as intervention duration, program delivery (e.g., teacher as interventionist vs. researcher as interventionist), or treatment fidelity?

### **Costs and Related Outcomes of Violence**

Conduct problems – including physical aggression – tend to be stable over time, especially if they emerge early in childhood (Bradshaw, Schaeffer, Petras, & Jalongo, 2010; Schaeffer et al., 2006). What begins as high levels of physical aggression and acting-out behavior in childhood may evolve into criminal, delinquent, or violent behavior in adolescence and adulthood (Schaeffer et al., 2006). The developmental trajectories of “early starters” (Patterson & Yoerger, 1997) in particular tends to be characterized by persistent and/or intensifying behavioral concerns, especially in the absence of any protective factors (Bradshaw et al., 2010).

Estimating the total costs of aggression is difficult. However, the costs of education for children with conduct disorder, for example, is substantially larger in comparison to children with related conditions (e.g., oppositional-defiant disorder, conduct disorder; Foster, Jones, & The Conduct Problems Prevention Research Group,



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2005). Young children who engage in aggressive behavior tend to have poorer academic outcomes (Brennan, Shaw, Dishion, & Wilson, 2012), and the inverse relationship is also often true. That is, children who perform poorly in school are more likely to engage in aggressive behavior (Brennan et al., 2012). These children may also be at increased risk for school dropout, as well as other associated outcomes including property destruction, hospitalization (due to violent acts), substance abuse, and incarceration (Litschge, Vaughn, & McCrea, 2009).

Aggressive behavior and conduct problems also have consequences which extend beyond an individual child, affecting his/her family, school, and community. A child with conduct problems may adversely impact the learning of nonaggressive peers in his/her classroom (Dodge & Pettit, 2003). Conduct problems may also create undue stress upon families and contribute to a maladaptive or coercive behavioral cycle in which a child's behavior elicits negative social interactions with parents (Patterson, DeBaryshe, & Ramsey, 1989).

### **Meta-Analysis and the Interpretation of Effect Sizes**

Meta-analysis is a technique used to synthesize the results of multiple studies. In essence, it is a study in which its participants are other studies. Because intervention studies may have different dependent variables and outcomes, the researcher must convert the results to a common statistical measure in order to compare the studies. This common statistical measure is called an effect size. Meta-analysis has several purported advantages, including that its results may be generalized to a larger population than those

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of individual studies, have greater statistical power, and resolve disagreements between individual studies.

There are different types of effect sizes (e.g., odds ratio, coefficient of determination), but the type most often reported in meta-analyses of educational research is the standardized mean difference. The standardized mean difference effect size refers to the difference that exists between two populations or conditions above and beyond that of variation or differences within the populations. That is, it is the difference between the means of the two populations after accounting for the standard deviations of the groups.

According to Cohen (1985), effect sizes of  $d = 0.2$  are considered small,  $d = 0.5$  are of moderate magnitude, and  $d = 0.8$  are large. In practice, it is not as clear-cut, however. If, for example, an intervention results in an effect size of  $d = 0.2$ , it would be considered a small effect by Cohen's standards. In a universal or school-wide program, this relatively small effect is spread across an entire student population, and it may have a meaningful impact on the functioning of the school. That is, when the effect is shown across an entire school population, it is possible to be worth the investment of time and resources. By contrast, an individually-delivered intervention reporting a similar effect size may not be worth the time or resources.

### **School-Based Interventions for Aggressive Behavior**

Schools and districts need to organize their resources and interventions to meet the learning needs of their students. Recently, many schools have chosen to do this according to the response to intervention (RTI) model. Within the RTI model, students

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are exposed to increasingly intensive and targeted programs or interventions if the general curriculum is insufficient in meeting their learning needs. Each student's learning needs, as well as the effectiveness of school-wide instruction and intervention, are evaluated through universal screening measures which all students complete. Ideally, most students' needs are satisfied by the universal instruction and intervention which all students receive. The remaining students who have additional needs receive selected or indicated interventions.

An adequate number of school-based interventions have been evaluated to allow for meta-analyses of their effectiveness. Some have focused on clients within special populations, such as ADHD (Erchul et al., 2009) or children with developmental disabilities (de Bruin, Deppeler, Moore, & Diamond, 2013; Petrenko, 2013). Some have also examined consultation and interventions in specific school settings, such as early childhood (Perry, Allen, Brennan, & Bradley, 2010). Others have examined suicide prevention (Balaguru, Sharma, & Waheed, 2013), children who are at-risk for school dropout (Liabo, Gray, & Mulcahy, 2012), youth with disabilities (Cobb, Sample, Alwell, & Johns, 2006), and social and emotional functioning (Whear et al., 2013).

Interventions for aggressive behavior include a wide variety of targeted outcomes, targeted populations, and implementation methods. For example, an intervention may target developing social-cognitive skills in students with emotional and behavioral disabilities (EBD) in a group-based setting. An intervention might also be implemented school-wide and promote positive social behaviors, such as respecting classmates and peers. Alternatively, an intervention may be individually delivered, focusing on self-

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monitoring to promote non-disruptive and non-impulsive behavior. There is a similar diversity in effect sizes reported among these interventions (Wilson, Lipsey, & Derzon, 2003). In general, however, research regarding aggressive or disruptive behavior interventions has reported positive findings (e.g., Litschge et al., 2009; Wilson et al., 2003; Wilson & Lipsey, 2007). That is, meta-analytic studies have found that interventions for aggressive or disruptive behavior generally results in a reduction of that behavior.

**Universal programs.** Universal programs are interventions that are implemented school-wide. They have the possible pragmatic advantage of reaching far more students and being more time-efficient than those implemented individually or in small groups. They also have the advantage of easily promoting common expectations across school settings (Blank et al., 2010). A school-wide intervention might generalize better than a specific contingency to which only one classroom or teacher adheres. Children can also learn from and support one another in developing appropriate, non-aggressive behavior (Blank et al., 2010). However, not all students will respond to a universal intervention.

In evaluating universal level programs, Durlak and his colleagues (2011) reported a small but positive effect on conduct problems ( $d = 0.22$ ) and positive social behavior ( $d = 0.24$ ). Though positive social behavior is not necessarily incompatible with conduct problems (i.e., an increase in positive social behavior does not always indicate a corresponding decrease in problematic behavior), it can be an indication of important changes in behavior. Another encouraging finding of this review is that teachers can

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implement universal interventions with similar effects (conduct problems:  $d = 0.20$ ; positive social behavior:  $d = 0.26$ ).

A similar overall effect was reported by Wilson and Lipsey (2007;  $d = 0.21$ ), though significant variability across the effect sizes among the different types of studies and outcomes measured was noted. In particular, studies using random group assignment was nearly double that of treatments using non-random assignment (Wilson & Lipsey, 2007). Among student variables, age was significantly associated with effect size. That is, interventions targeting younger students showed larger effect sizes than those targeting older students (Wilson & Lipsey, 2007).

A slightly lower effect size ( $d = 0.11$ ) was reported by Dymnicki, Weissberg, and Henry (2011). Universal programs evaluated in this meta-analysis, however, needed to include a measure of direct physically aggressive behavior. This is a much narrower definition of problematic behavior than many other meta-analytic reviews (Dymnicki et al., 2011). Reduction of physically aggressive behavior was not necessarily the target of all interventions, either. Many targeted social or emotional outcomes, which may have influenced behavioral outcomes in turn (Dymnicki et al., 2011).

**Indicated interventions.** Interventions that target a specific student population identified as at-risk for problematic behaviors are selected interventions. Students may be identified based on previous or ongoing conduct problems (e.g., frequent office discipline referrals [ODRs], receiving services for EBD, truancy) or some risk factor (e.g., teacher nomination based on social difficulties or minor disruptive behavior in

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class). They are often delivered outside of a typical classroom (in a resource or special education classroom), or they may be integrated into a mainstream classroom and target the selected student(s). For example, a student receiving a daily behavior report card and checking in with a teacher every morning might be considered a targeted intervention.

Overall effect sizes for these interventions are slightly higher than those of universal programs (Stage & Quiroz, 1997; Wilson & Lipsey, 2007), and tend to indicate similar trends. A mean effect size of  $d = 0.29$  was found across 108 studies of selected or indicated programs (Wilson & Lipsey, 2007). Somewhat higher effect sizes were reported among behavioral interventions, high risk students (i.e., indicated more so than selected) and interventions implemented with greater integrity; and, lower effect sizes were reported in groups with higher attrition rates (Wilson & Lipsey, 2007).

Stage and Quiroz (1997), focusing on the reduction of disruptive behavior, reported effect sizes as high as 0.98 for students with serious emotional disturbances. In their review, effect sizes are reported as negative, indicating a reduction in the behavior. Interventions delivered in a resource room ( $d = 0.86$ ) or self-contained room ( $d = 0.97$ ) were particularly effective. Indicated groups identified as having aggression or conduct problems were generally the most resistant to change (Stage & Quiroz, 1997). That is, students with ODD, CD, or aggressive behavior were less likely to respond to interventions targeting disruptive behavior.

**Individual treatments and interventions.** Some indicated interventions are delivered individually or have a one-on-one component. They are especially promising

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for high-risk students, or those with higher initial levels of conduct problems (Stolz, van Londen, Dekovic, de Castro, & Prinzie, 2012). For example, a child exhibiting highly aggressive behaviors receiving an intervention one-on-one will be less likely to influence the behavior of his/her peers than if he/she had received the intervention in a group. That is, individually-delivered interventions can help mitigate the “peer contagion” of socially inappropriate and aggressive behaviors (Stolz et al., 2012). An individual intervention can be more easily modified to address a child's specific needs. Interventions delivered as part of a student’s individual education plan (IEP) or behavior plan may fall into this category.

Stolz and colleagues (2012) reported the overall random mean effect size across 24 studies to be  $d = 0.30$ . This effect size was similar for both individual interventions and interventions with individual and additional components (e.g., group intervention, parent involvement, classroom modifications), but the range of effects was slightly wider for interventions with multiple components (Stolz et al., 2012). This may have been a function of age (i.e., younger children showing larger effects than older children), but moderating effects were not investigated. In their review, Lipsey and Wilson (2007) reported slightly higher effect sizes among indicated treatments delivered individually. Overall, current evidence suggests that individual interventions can be effective in reducing conduct problems.

**Demonstration vs. routine practice programs.** Previous research made a distinction between demonstration and routine practice programs (Petrenko, 2013; Wilson & Lipsey, 2007; Wilson, Lipsey, & Derzon, 2003). *Routine practice programs*

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are “those implemented in a school on an ongoing routine basis and evaluated by a researcher with no direct role in developing or implementing the program” (Wilson & Lipsey, 2007, p. S142). On the other hand, demonstration programs are those in which researchers were heavily involved not only in the collection of outcome data but also the development and/or implementation of the school-based intervention. Although it was a goal of the current study to include routine practice programs, no studies included in the final analysis were identified as such. All of the studies were either demonstration programs or research programs, in which a researcher was responsible for virtually all aspects of the intervention’s development and delivery.

### **Characteristics of Effective Interventions**

It is important to know not only what is effective but also to understand why it is effective. Several meta-analytic studies also examined the characteristics of effective interventions (e.g., Durlak et al., 2011; Dymnicki et al., 2011; Litschge et al., 2009; Wilson et al., 2003; Wilson & Lipsey, 2007; Sklad et al., 2012). There is a general consensus among the studies that there are several characteristics of effective interventions for aggressive and disruptive behaviors. First, behavioral interventions that focused on skill acquisition or skills training tended to report higher effect sizes (Dymnicki et al., 2011; Litschge et al., 2009). These might include conflict resolution skills, social problem-solving skills, how to make friends, or role playing with an adult. Equally important, these targets have been associated with overt aggressive behavior (Dymnicki et al., 2011).



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Second, interventions involving the family and having parent training components also tended to report higher effect sizes (Dymnicki et al., 2011; Bradley & Mandell, 2005). Particularly when behavior is problematic at both school and home, it can be helpful to involve parents and equip them with the skills they need to appropriately respond to their child's behavior.

Third, although teachers are able to implement interventions effectively (Durlak et al., 2011), many studies report on interventions delivered with the assistance of experts and researchers (Wilson et al., 2003; Wilson & Lipsey, 2007). The authors caution that these findings may overstate the effects that are more typical of “routine practice” – that is, the common implementation practices more likely to be found in schools in the absence of research assistance (Wilson et al., 2003). However, conflicting findings were reported by Sklad et al. (2012), in which similar effect sizes were demonstrated between interventions delivered by professionals and those delivered without professionals.

Fourth, and somewhat unsurprisingly, programs implemented with a higher degree of fidelity demonstrated larger effects (Wilson & Lipsey, 2007). An increasing trend of reporting measures of fidelity or implementation integrity has been noted in the literature (Wilson et al., 2003). Fifth, the risk level and age of the students receiving interventions was significantly related to intervention effects (Matjasko et al., 2012; Stolz et al., 2012; Wilson & Lipsey, 2007). That is, younger children tended show larger effect sizes than older children, and children of high risk show larger effect sizes than children of low risk.

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Many variables once suspected as being moderators or mediators of intervention effectiveness have failed to emerge as significant. Whether the intervention was manualized or largely unstructured was not associated with significantly different effect sizes, for example (Wilson & Lipsey, 2007). Many individual characteristics besides age, such as sex, have had mixed or non-significant findings (Matjasko et al., 2012). Findings on program characteristics such as poor or weak methodological design did not appear to produce significant differences, either (see Wilson, Gottfredson, & Najaka, 2001).

### **Common Limitations**

There are several limitations common to literature on interventions for conduct problems. First, the risk factors and efficacy of interventions is not as well understood for school-age girls (Masseti et al., 2011). Though most violent behavior among youth is perpetrated by boys (Centers for Disease Control and Prevention, 2011), conduct problems still occur at a concerning rate among girls (Masseti et al., 2011). Most intervention studies involve samples that are predominately and sometimes exclusively male (Cobb et al., 2006; Massetti et al., 2011).

Second, meta-analytic studies are often susceptible to the “file drawer” or publication bias. That is, there is a tendency for significant rather than non-significant results to be published. This has the potential of inflating mean effect sizes across studies since non-significant results are more likely to be excluded from analysis. However, some studies conducted file drawer analyses (Rosenthal, 1979) indicating that hundreds of unpublished non-significant studies would need to exist to invalidate their findings

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(Reddy et al., 2009; Sklad et al., 2012). Wilson and his colleagues (2006) also included some unpublished studies and manuscripts in their review.

Third, studies of targeted or individualized aggressive behavior interventions have high rates (i.e., > 10%) of attrition (see Wilson and Lipsey, 2007). Participants may drop out of the studies in an unsystematic way, resulting in biased results or outcomes. If, for example, participants may drop out of a study because they are not responding to the intervention, which may inflate the effects of the intervention for those remaining in the study.

### **Summary & Statement of Problem**

There is evidence that school-based interventions for conduct problems are generally effective. Some interventions target specific groups, whereas others are delivered at the universal level. Some focus on various outcomes, such as building specific skills, reinforcement of alternate behavior, reducing dropout rates or office referrals, or prevent antisocial and aggressive behaviors. Interventions are implemented by school psychologists or developed as a result of their role in consultation with teacher, but they can also be implemented by teachers with similar efficacy (Durlak et al., 2011).

The existing meta-analytic studies highlight several characteristics of successful or effective interventions. These include implementing interventions at a young age, including behavioral components, monitoring for intervention integrity, and involving parents. But, research needs to investigate several areas further, such as the effect of interventions on violence prevention among girls (Masseti et al., 2011) and programs for

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students with emotional/behavioral disabilities (Reddy et al., 2009). The concern noted by Wilson and Lipsey (2007), too, remains relevant. That is, the interventions reviewed in many studies and meta-analyses do not represent “routine practices” in schools. Future research should provide some guidance in these areas.

The current study intends to fill in three gaps currently found in aggressive behavior intervention outcome research. First, there have been no significant meta-analytic studies concerning the outcome of school-based interventions for overt, physically aggressive behavior completed using the past ten years of research. Second, there have been no meta-analyses focused exclusively on elementary-aged students. Third, there has been very little research published on the effects of school-based programs and interventions developed and implemented without the assistance of researchers or outside experts (i.e., routine practice programs).

There are two specific research questions which this meta-analysis will address. First, what research has been conducted in the past ten years that examines the outcomes of school-based aggressive behavior interventions for elementary-aged students? Second, what are the effects of these interventions, and are these effects different when universal programs are compared based on characteristics such as intervention duration, program delivery (e.g., teacher as interventionist vs. researcher as interventionist), or treatment fidelity?

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### **Method**

In order to address these research questions, I completed a four step process. First, I retrieved studies from electronic databases. Then, I screened abstracts and confirmed that the studies met relevant inclusion criteria. Next, I coded the studies for effect sizes and study descriptors. Finally, I completed correction procedures, such as effect size weighting in order to complete the final statistical analysis.

### **Search & Retrieval of Studies**

I located studies using the electronic databases PSYCInfo, Educational Resources Information Center, and the Medical Literature Analysis and Retrieval System Online (MEDLINE). Search terms for the present review included the following: school-based, intervention, treatment, consultation, behavior\*, conduct, disruptive, aggressive, acting out, emotion\*, externalizing, and outcome. A “\*” indicates that different endings were included in the search (e.g., *behavior\** would retrieve results for behavior, behaviors, behavioral, etc.). Using various combinations of search terms, up to 3,571 possible studies were identified. Based on inclusion criteria and reviews of abstracts, however, far fewer studies were eligible for the meta-analysis. I also identified articles by searching the references of the studies identified in the initial, electronic literature search. Searching through the references of previous meta-analyses provided additional articles.

I retrieved the identified studies from the library (physical or electronic) or requested them through interlibrary loan. Studies that were located in sources other than peer-reviewed publications (e.g., unpublished dissertations, single participant case

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studies) were not retrieved. I was able to retrieve nearly all studies identified by these sources (i.e., electronic search, ancestral search) for screening.

The initial screening yielded 49 eligible studies. Twenty-nine studies were excluded for not meeting the inclusion criteria for this meta-analysis: ten studies examined interventions in settings other than elementary schools (e.g., middle or high school, parent/home interventions, community interventions) or reported on a combined sample of elementary and secondary school students; nine did not include measures of aggressive or disruptive behavior (e.g., measured indirect/verbal aggression or combined direct/indirect aggression into a single measure); one study was a single-subject design; and nine studies reported results in such a way that an effect size was unable to be calculated. That is, some studies reported only partial information (e.g., a p-value), and the effect size and variance were unable to be back-computed. Twenty studies were included in the final analysis.

### **Study Inclusion Criteria**

Studies selected for this meta-analysis met a set of inclusion criteria. First, the study was reported in English and involved a school-based intervention. The intervention was delivered in an elementary or preschool setting. The intervention could also have been delivered at a secondary level if it reported outcomes for the elementary sample separately. The rationale for this criterion is that research has found that aggressive behavior often has an early onset and becomes more challenging to address later in

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childhood or adolescence (Bradshaw, Schaeffer, Petras, & Ialongo, 2010; Schaeffer et al., 2006).

Second, the outcomes measured in the study represented direct, aggressive or violent behavior. Examples of direct aggressive behavior might include hitting, kicking, biting, property destruction, or other indicators of having been in a physical fight. The studies did not report on verbal (e.g., yelling, swearing, threatening) or indirect (e.g., purposefully excluding another person, spreading rumors about a student) aggression unless they also had a measure of direct aggression. Measures of direct aggression included ratings of physical aggression, injury reports or other documentation of physical aggression, and direct observation. Other outcomes – such as academic performance, internalizing problems, social skills, attention problems, or school attendance – may have also been included.

Third, the study used an experimental or quasi-experimental design. To qualify as an experimental or quasi-experimental design, the study had to have either (a) a control condition or group or (b) a one-group pre-posttest design. This criterion excluded qualitative studies that would not provide data to contribute to the calculation of an effect size. This criterion also excluded studies of single-subject design, since there is no widely accepted statistical method to synthesize the results of both group and single-subject research in a single meta-analysis (Lipsey and Wilson, 2001). Fourth, the study was published in a peer-reviewed journal within the last 10 years (i.e., 2004 or later). This final criterion was a practical constraint due to the difficulty in retrieving

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dissertations or unpublished manuscripts, as well as limiting the overlap of studies included in previous meta-analyses.

### **Coding of Studies**

Eligible studies were coded by the author. Twenty percent of the studies (4) were randomly selected to be coded by a trained researcher. The coding was compared between raters to assess coder reliability. Disagreements or questions about coding were resolved by discussion. Inter-rater reliability was found to be acceptable for all coding categories (percent agreement = 92.5%).

**Effect size coding.** Results from the studies were coded to represent the average (mean) reduction in aggressive or disruptive behavior from pretest to post-test or the difference in aggressive behavior between groups. This approach allowed both control group designs and one-group pre-posttest designs to contribute to the same meta-analysis.

Given the repeated measures designs included in this review, the effect size statistic calculated for this meta-analysis was the standardized mean change effect size (Becker, 1988). The standardized mean change effect size is the difference between the post-test mean and the pretest mean for a group divided by the pooled standard deviation (Becker, 1988). That is,

$$d = (x_1 - x_2)/s_2$$

Where  $x_1$  is the pretest mean (or treatment group mean),  $x_2$  is the posttest mean (or control group mean), and  $s_2$  is the pooled standard deviation. This statistic has been



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recommended in meta-analyses including repeated measures (Morris, 2008; Wilson, Lipsey, & Derzon, 2003).

To control for sampling error, effect sizes were weighted by the inverse of their sampling error variance. The weighting procedure is described below. In short, larger studies and studies with fewer sources of random variation are given greater weight (Morris, 2008).

**Study descriptor coding.** Several other characteristics in addition to effect sizes were coded for each study. These included the study characteristics, such as year of publication and country or countries represented in the study. It also included subject/sample characteristics, such as the age and gender distribution of the sample, ethnicity, socioeconomic status, attrition, and risk status (e.g., general, selected, indicated).

The coding included program characteristics, such as intervention format (e.g., universal, selected/pull-out), delivery personnel, treatment format (i.e., individual, group, or mixed), manualized (or non-manualized), demonstration vs. routine practice programs (see Wilson, Lipsey, & Derzon, 2003), intervention duration and frequency, intervention fidelity, and treatment modality (e.g., counseling, cognitive, social problem solving). Finally, method characteristics were coded, such as source of dependent variable, study design, and number of items.

Table 1 summarizes the descriptors of the studies included in the meta-analysis. Sample sizes of the studies ranged from 21 to 4,148 students (a school-wide

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intervention). Most interventions or treatments under investigation were manualized or highly structured group interventions using schools in the U.S.

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**Table 1.** Study characteristics of aggressive behavior outcome studies

Variable	<i>n</i>	%	Variable	<i>n</i>	%
STUDY CHARACTERISTICS			PROGRAM CHARACTERISTICS		
<i>Publication year</i>			<i>Program format</i>		
2006-2007	1	5.6	Universal/in-class	10	55.6
2008-2009	4	22.2	Selected/pull-out	5	27.8
2010-2011	5	27.8	Comprehensive	3	16.7
2012-2013	5	27.8	<i>Manualized vs. routine practice</i>		
2014-2015	3	16.7	Manualized or structured program	17	94.4
<i>Country of study</i>			Unstructured program	1	5.6
USA	11	61.1	<i>Demonstration vs. routine practice</i>		
UK	1	5.6	Research program	5	27.8
Germany	1	5.6	Demonstration program	13	72.2
Belgium	1	5.6	Routine practice	0	0
Italy	1	5.6	<i>Program duration</i>		
Netherlands	3	16.7	Less than 7 weeks	1	5.6
SUBJECT CHARACTERISTICS			7 to 18 weeks	7	38.9
<i>Gender mix</i>			18 to 36 weeks	5	27.8

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All males (>95%)	0	0	More than 36 weeks	5	27.8
>60% males	7	38.9	<i>Treatment frequency</i>		
50%-60% males	6	33.3	Less than weekly	3	16.7
<50% males	4	22.2	1 to 2 times per week	11	61.1
Missing	1	5.6	3 to 4 times per week	3	16.7
<i>Grade of participants</i>			missing	1	5.6
PreK to K	1	5.6	<i>Treatment fidelity</i>		
1 <sup>st</sup> to 2 <sup>nd</sup>	1	5.6	No problems (>80% fidelity)	8	44.4
3 <sup>rd</sup> to 5 <sup>th</sup>	12	66.7	Some problems (<80% fidelity)	5	27.8
elementary aged (6-11)	4	22.2	Not reported	5	27.8
<i>Predominate ethnicity</i>			<i>Treatment modality</i>		
White	5	27.8	Social problem solving	2	11.1
Black	2	11.1	Social skills training	2	11.1
Hispanic	1	5.6	Anger management	1	5.6
Other minority	1	5.6	Behavioral treatment	1	5.6
Mixed	8	44.4	Multimodal	11	61.1
Missing	1	5.6	Other	1	5.6
<i>SES</i>			<b>METHOD CHARACTERISTICS</b>		
Mainly low SES	7	38.9	<i>Study design</i>		

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Middle SES	1	5.6	Within-group pretest/posttest	3	16.7
Mixed, low to middle	3	16.7	Between-group comparison	15	83.3
Missing	7	38.9	<i>Source of DV</i>		
<i>Subject risk</i>			Teacher report	8	44.4
General (low risk)	5	27.8	Self-report	4	22.2
Selected (some risk factors present)	4	22.2	Records, archives	1	5.6
Indicated (problem behavior)	4	22.2	Observations	1	5.6
Prevention	5	27.8	Parent report	1	5.6
<i>Treatment format</i>			Peer report	3	16.7
Individual	3	16.7	<i>Number of items</i>		
Group	12	66.7	Single item	2	11.1
Mixed	3	16.7	2-5 items	4	23.5
<i>Program delivery</i>			More than 5 items	11	64.7
Teacher	7	38.9	<i>Attrition</i>		
Researcher	2	11.1	None (or not available)	11	61.1
Multiple personnel	5	27.8	1%-10%	2	11.1
Other	4	22.2	>10%	5	27.8

SES = socioeconomic status (usually inferred from % students receiving free/reduced lunch); DV = dependent variable

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### **Analytic and Correctional Procedure**

Effect size estimates can be biased for a number of reasons. Without appropriate weights, studies with small samples ( $n < 100$ ) are treated the same as studies with much larger samples ( $n > 500$ ). However, studies including a larger sample size should be given preference in calculating an overall effect size. Effect sizes were therefore multiplied by the inverse of its sampling error variance (Becker, 1988). That is,

$$1/s^2 = w = 2n_1n_2(n_1+n_2)/(2(n_1+n_2)^2+n_1n_2d^2)$$

Some studies assigned conditions on a group level, which effectively reduces the sample size (Wilson & Lipsey, 2007). That is, treatment and control conditions were assigned by classroom or school rather than random assignment at the individual level. Such assignment reduces the variability of the study sample. Unfortunately, no adjustments were able to be made to account for this design effect. If there is an effect on the analysis and effect size estimates, it would be due to the slightly larger weight assigned to the study's effect size than is actually appropriate.

Other study artifacts were unable to be accounted for – these included dichotomization of a continuous dependent variable, attrition, and range variation. On rating scales, for example, the intensity of the target behavior would be categorized as “1, 2, ..., 5,” or something to that effect. The rating of the behavior is forced into a category that does not necessarily reflect the intensity of the behavior. Also, participants in selected or at-risk programs (i.e., those who are already identified as having problematic behavior) may drop out in such a way that “good” candidates (those more likely to

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improve in their behavior) are overrepresented in the sample. Finally, participants in selected programs also have more room, so to speak, for change in their behavior.

School-wide interventions including a broader sample are more likely to include typically behaving students whose behavior cannot change as much as students in a selected or indicated intervention.

### **Results**

The results of the current study include the descriptive characteristics of the studies included in the final analysis, the overall effect size, and a comparison of various effect sizes based on certain study characteristics (e.g., treatment fidelity, program duration).

#### **Descriptive Characteristics of the Studies Reviewed**

The general characteristics of the 18 studies for which data were retrieved are shown in Table 1. Method, program and subject characteristics were reported in nearly all of the studies. A majority (61%) of the studies were completed in the United States, and all reported samples comprised a mix of boys and girls. Students from minority groups were well represented in many studies, with nearly half (44%) of the studies having a mixed sample and a further 22% of studies having a sample of predominately students from minority groups. Two-thirds of the studies included participants from the upper elementary grades (ages 8-11), and 67% of studies reported on group-delivered interventions.

Regarding program characteristics, most studies included in the analysis were manualized, universal interventions. Only one study (i.e., Fung, 2012) reported the outcomes for a non-manualized intervention. Similarly, 72% of studies reported intervention outcomes for demonstration programs. Most interventions were delivered up to 2 times per week – only 17% were delivered 3 or 4 times per week. Just under half of the interventions (44%) reported having no problems in the fidelity of the intervention, but 5 of the studies (28%) did not report on measures of treatment fidelity at all.



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Most (83%) of the studies used between-group comparisons. The source of the outcome, or dependent variable, was most often teacher report (44%), though some also used self-report (22%) or peer report/nominations (17%). With the exception of one study (5%) which included direct observation, all other studies used behavior rating scales as their dependent measure. Eleven studies (61%) reported that there was no subject attrition; this includes studies which did not report on subject attrition.

### **Program Effectiveness**

The overall mean weighted effect size was  $d = .15$ . The overall test of homogeneity was statistically significant,  $Q(45) = 271.85, p < .001$ , suggesting the studies are not estimating the same population parameter. This variation was expected to be associated with the nature of the interventions, students, and study methods. That is, the current sample of studies reported intervention outcomes for varying intervention targets, populations of interest, and study parameters.

Due to the variation in subject risk level, intervention duration, personnel delivery, and treatment fidelity, additional effect sizes were calculated. Table 2 presents the effect sizes calculated based on these variables. In general, selected or indicated interventions had greater effects ( $d = 0.23$ ) than those delivered universally ( $d = 0.15$ ). Short-term interventions (i.e., those lasting less than 18 weeks) had greater effects than those lasting 18 to 36 weeks and similar effects to those lasting longer than 36 weeks. Teachers were the least efficacious in terms of intervention delivery,  $d = 0.11$ , although teachers were most often the person(s) responsible for delivering the intervention. Also, those interventions reporting no issues with fidelity tended to report larger effect sizes ( $d$

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= 0.23) than those studies in which problems with fidelity were reported ( $d = 0.11$ ) or not reported at all ( $d = 0.12$ ).

**Table 2.** Weighted effect sizes based on variables of subject risk level, intervention duration, program delivery, and treatment fidelity.

Variable	Weighted ES (95% CI)	Standard Error	% Weight
<b><i>Subject Risk Level</i></b>			
Universal/Prevention (n = 10)	0.15 (0.14-0.16)	0.005	19
Selected/Indicated (n = 8)	0.23 (0.19-0.28)	0.022	81
<b><i>Intervention Duration</i></b>			
7 to 18 weeks (n = 7)	0.20 (0.17-0.24)	0.018	24
18 to 36 weeks (n = 5)	0.06 (0.04-0.07)	0.008	30
More than 36 weeks (n = 5)	0.19 (0.18-0.20)	0.003	43
<b><i>Program Delivery</i></b>			
Teacher (n = 7)	0.11 (0.09-0.13)	0.008	42
Researcher (n = 2)	0.37 (0.25-0.49)	0.061	2
Multiple Personnel (n = 5)	0.15 (0.15-0.16)	0.002	40
Other (n = 4)	0.20 (0.17-0.24)	0.017	16

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<i>Treatment Fidelity</i>			
High fidelity (> 80% fidelity)(n = 8)	0.23 (0.21-0.25)	0.012	29
Lower fidelity (< 80% fidelity)(n = 5)	0.11 (0.11-0.12)	0.004	63
Not reported (n = 5)	0.12 (0.06-0.18)	0.029	7

### **Discussion**

The current meta-analysis intended to address the absence of meta-analytic research on the outcomes of school-based interventions for overt, physically aggressive behavior. An overall weighted effect size of  $d = 0.15$  was derived from a sample of 18 outcome studies. Effect sizes were generally higher when the intervention was implemented by a researcher, adhered to stricter standards of intervention integrity, and involved a targeted student population (as opposed to being delivered universally).

Similar to previous meta-analyses (e.g., Wilson, Lipsey, and Derzon, 2003), this meta-analysis included research on aggressive behavior interventions resulting exclusively from demonstration or research programs. This occurred despite a thorough search through the most recent ten years of research and broad study inclusion criteria allowing for one-group pre-posttest studies. These results tell us very little about the effects of such aggressive behavior interventions as they are actually implemented by schools. That is, the effects most commonly reported in the literature may be more promising than what is achieved in routine practice. What this does suggest, however, is that there is very little evidence published about the actual effectiveness of everyday practices.

On the other hand, these studies may represent what is possible for school-based interventions under ideal conditions. Many of the interventions, although developed and supervised by researchers, were implemented by teachers or other school staff and may have lasted over the course of an entire school year or longer. Similarly, many of the

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interventions required very little training and could conceivably be implemented in routine school practice.

Unfortunately, even under ideal conditions the mean difference between pre-posttest aggressive behavior produced by the interventions corresponded to an effect size of approximately .15. If, for example, 10% of children will get into a fight during a school year, an overall effect size of .15 would correspond to approximately a two percentage point reduction in fighting. That is, if 10% of the students were getting into physical fights prior to a school-based intervention, the average effect of the interventions in this meta-analysis would produce a rate of 7.8%. This reduction in fighting may or may not be meaningful for the school depending on the amount of resources dedicated to producing this change.

For those studies including two groups (i.e., intervention vs. control), little change was observed in levels of aggressive behavior for those in control or “business as usual” groups. This was true whether the intervention period was over a year or even as short as seven weeks. This is consistent with previous meta-analyses (Dymnicki, Weissberg, & Henry, 2011; Wilson, Lipsey, & Derzon, 2003), as well as longitudinal research indicating that levels of aggressive behavior tends to be stable in the absence of intervention (Bradshaw, Schaeffer, Petras, & Ialongo, 2010; Dodge & Pettit, 2003; Schaeffer et al., 2006).

Also, the variability in effect sizes observed in the current study was similar to that reported in previous studies (Dymnicki, Weissberg, & Henry, 2011; Petrenko, 2013; Wilson & Lipsey, 2007). Although efforts were made to limit the results of the current

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study to the outcomes of overt physical aggression, there were a number of ways in which physical aggression was measured – teacher report, peer nominations, self-report, etc. Surprisingly, no studies included incident/injury reports, records of physical restraint, or office discipline referrals (as a result of physical aggression) in their measures. These data collection procedures are relatively low-effort, and many schools already collect these type of data. Future research could use these types of data to measure the effects of interventions.

A variety of outcome measures were included in the studies, but only the Ostrov et al. (2008) study used direct observation in order to measure reduction of physical aggression. Although classroom observation is time- and resource-intensive, it has the potential to provide a more reliable and sensitive measure of changes in aggression. For example, if a student hits other students in his/her classroom an average of five times per day prior to intervention and after two weeks of intervention, the student now engages in this behavior an average of four times per day. This reduction would be more easily detected by direct observation (or a frequency count) than through indirect rating scales in which the aggressive behavior is forced into categories such as “often” or “almost always.”

The intervention programs were not all equally successful in reducing overt aggressive behavior. As in previous meta-analyses (Wilson & Lipsey, 2007), there was a diversity of effect sizes among the different intervention programs. Unsurprisingly, selected or indicated interventions tended to produce greater effects than those delivered universally. This may be due in part to at-risk students having more room for

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improvement than the general school population. A universal intervention may not be able to produce practical effects for a typical student who already engages in aggressive behavior infrequently. A universal intervention also may not be of sufficient intensity to reduce the aggressive behavior of an at-risk student who would be more appropriately served by a selected or indicated program.

Likewise, interventions delivered with high fidelity tended to have much greater effects than those reporting problems with intervention fidelity (or those that did not report on fidelity at all). This aligns with previous research which has emphasized the importance of intervention fidelity (Dymnicki, Weissberg, & Henry, 2011; Erchul & Sheridan, 2008; Wilson & Lipsey, 2007). Furthermore, when there are significant reductions in aggressive behavior following a poorly implemented intervention, it is difficult (if not impossible) to establish whether the change was a result of the intervention. A similar difficulty lies in claiming the relative ineffectiveness of an intervention when it is implemented with low fidelity.

### **Limitations and Future Research**

This meta-analysis had at least four limitations of note. Publication bias, or the “file drawer problem” (Rosenthal, 1979), is a well-known limitation to meta-analysis, to which the current study was no exception. That is, it only included published studies due to the difficulty in retrieving dissertations and unpublished studies. The results of research that are readily available (i.e., published) on school-based behavior interventions may differ from the results of all research in this area – published and unpublished. A meta-analysis may have misleading results if it is drawn from a biased sample of studies,

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regardless of how thorough and systematic its selection and analytic procedures are otherwise. Aside from the traditional definition of publication bias to which this study was susceptible, it was also affected by other forms of publication and associated dissemination biases including: language bias (selective inclusion of studies published in English), availability bias (selective inclusion of studies readily available through limited online subscriptions), and familiarity bias (selective inclusion of studies only from one's own discipline)(Rothstein, Sutton, & Borenstein, 2005; Song et al., 2000).

Second, this meta-analysis only included outcome studies for elementary-aged students. It may not represent the effects of school-based aggressive behavior interventions delivered at the secondary level. Third, the results may not be representative of what occurs in routine practice, as mentioned above. All of the intervention programs included in the final analysis were the product of researchers, though many were delivered by teachers.

Fourth, this meta-analysis cannot provide reliable information about specific or distinctive features of interventions which are likely to produce greater effects. That is, it cannot recommend a specific program, strategy or treatment modality due to the inability to make comparisons between the relatively small number of outcome studies included in the final analysis. Previous research has indicated that behavioral approaches tend to produce greater effects (e.g., Wilson & Lipsey, 2007).



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### **Implications for Practice**

Although this meta-analysis cannot make specific recommendations, it may be able to provide more general guidance for selecting and implementing aggressive behavior interventions in elementary schools. First, intervention integrity is required not only to accurately evaluate an intervention's effects but also to ensure an opportunity for an intervention to produce these effects. Collecting this information is a requirement in other scientific fields, yet 27.8% of studies in this meta-analysis did not report any information about integrity.

Intervention integrity may be evaluated in at least two different ways. A school psychologist or other professional may provide feedback about the implementation of an intervention. Otherwise, interventionists and teachers may use intervention integrity checklists to evaluate their integrity themselves. A school or district may find it beneficial to provide explicit training, supervision, and administrative support to its interventionists to promote intervention integrity.

Second, it appears that everyday, "business as usual" approaches to aggressive behavior are inadequate in reducing aggressive behavior. Very little change was observed in control groups in the outcome studies, again confirming the relatively stable trajectory of aggressive behavior in the absence of intervention (Bradshaw et al., 2010). Third, schools can use data that they may already be collecting, such as office discipline referrals, incident/injury reports, and physical restraint records, to document the effects of an intervention on aggressive behavior. Although they are underrepresented in the

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literature, they may provide more information about behavior than rating scales or some of the other methods more commonly used.

In conclusion, much more needs to be learned about the effects of interventions and practices that are more representative of what occurs routinely in schools. It is teachers and other support staff who most often deliver interventions, not highly trained researchers and/or their assistants. Additionally, future research may explore the relative effectiveness of different intervention modalities since there was insufficient evidence to make that comparison in this study. I hope that this study will serve as a call to researchers (and schools, for that matter) to evaluate the effects of programs which already exist in schools.

**References**

- Becker, B. J. (1988). Synthesizing standardized mean-change measures. *British Journal of Mathematical and Statistical Psychology*, *41*, 257-278.
- \* 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*(4), 605-617.  
doi:10.1007/s10802-007-9116-5.
- \*Bierman, K. L., Coie, J., Dodge, K., Greenberg, M., Lochman, J., McMohan, R., & Pinderhughes, E. (2013). School outcomes of aggressive-disruptive children: Prediction from kindergarten risk factors and impact of the Fast Track prevention program. *Aggressive Behavior*, *39*(2), 114-130. doi:10.1002/ab.21467.
- Blank, L., Baxter, S., Goyder, E., Naylor, P. B., Guillaume, L., Wilkinson, A., Hummel, S., & Chilcott, J. (2010). Promoting well-being by changing behavior: A systematic review and narrative synthesis of the effectiveness of whole secondary school behavioral interventions. *Mental Health Review Journal*, *15*(2), 43-53. doi: 10.5042/mhrj.2010.0371.
- Bradley, M. C., & Mandell, D. (2005). Oppositional defiant disorder: A systematic review of evidence of intervention effectiveness. *Journal of Experimental Criminology*, *1*, 343-365.
- Bradshaw, C. P., Schaeffer, C. M., Petras, H., & Ialongo, N. (2010). Predicting negative life outcomes from early aggressive-disruptive behavior trajectories: Gender

## AGGRESSIVE BEHAVIOR INTERVENTIONS

differences in maladaptation across life domains. *Journal of Youth & Adolescence*, 39(8), 953-966.

Brennan, L. M., Shaw, D. S., Dishion, T. J., & Wilson, M. (2012). Longitudinal predictors of school-age academic achievement: Unique contributions of toddler-age aggression, oppositionality, inattention, and hyperactivity. *Journal Of Abnormal Child Psychology*, 40(8), 1289-1300. doi:10.1007/s10802-012-9639-2.

Castillo, J. M., Curtis, M. J., & Gelley, C. (2012). School psychology 2010 – part 2: School psychologists' professional practices and implications for the field. *Communiqué*, 40(8), 4-6.

Centers for Disease Control and Prevention. (2011). *Youth risk behavior surveillance – United States, 2011*. Washington, D.C.: U.S. Government Printing Office.

\* Crean, H. F., & Johnson, D. B. (2013). Promoting Alternative Thinking Strategies (PATHS) and elementary school aged children's aggression: Results from a cluster randomized trial. *American Journal Of Community Psychology*, 52(1-2), 56-72. doi:10.1007/s10464-013-9576-4.

\* Crick, N. R., Ostrov, J. M., & Werner, N. E. (2006). A Longitudinal Study of Relational Aggression, Physical Aggression, and Children's Social-Psychological Adjustment. *Journal Of Abnormal Child Psychology*, 34(2), 131-142. doi:10.1007/s10802-005-9009-4.

de Bruin, C. L., Dappeler, J. M., Moore, D. W., & Diamond, N. T. (2013). Public school-based interventions for adolescents and young adults with an autism spectrum

## AGGRESSIVE BEHAVIOR INTERVENTIONS

disorder: A meta-analysis. *Review Of Educational Research*, 83(4), 521-550.

doi:10.3102/0034654313498621.

Dodge, K. A., & Pettit, G. S. (2003). A biopsychosocial model of the development of chronic conduct problems in adolescence. *Developmental Psychology*, 39, 349 – 371.

Dymnicki, A. B., Weissberg, R. P., & Henry, D. B. (2011). Understanding how programs work to prevent overt aggressive behaviors: A meta-analysis of mediators of elementary school-based programs. *Journal of School Violence*, 10, 315-337. doi: 10.1080/15388220.2011.602599.

Erchul, W. P., & Martens, B. K. (2002). *School consultation: Conceptual and empirical bases of practice* (2<sup>nd</sup> ed.). NY: Kluwer Academic/Plenum.

Erchul, W. P., & Sheridan, S. M. (2008). *Handbook of research in school consultation*. NY: Routledge.

Farahmand, F. K., Grant, K. E., Polo, A. J., Duffy, S. N., & DuBois, D. L. (2011). School-based mental health and behavioral programs for low-income, urban youth: A systematic and meta-analytic review. *Clinical Psychology Science and Practice*, 18(4), 372-390.

\*Fonagy, P., Twemlow, S. W., Vernberg, E. M., Nelson, J. M., Dill, E. J., Little, T. D., & Sargent, J. A. (2009). A cluster randomized controlled trial of child-focused psychiatric consultation and a school systems-focused intervention to reduce

## AGGRESSIVE BEHAVIOR INTERVENTIONS

aggression. *Journal Of Child Psychology And Psychiatry*, 50(5), 607-616.

doi:10.1111/j.1469-7610.2008.02025.x.

Foster, E. M., Jones, D. E., & and The Conduct Problems Prevention Research Group.

(2005). The High Costs of Aggression: Public Expenditures Resulting From Conduct Disorder. *American Journal of Public Health*, 95(10), 1767–1772.

doi:10.2105/AJPH.2004.061424.

\* Fung, A. L. (2012). Intervention for aggressive victims of school bullying in Hong

Kong: A longitudinal mixed-methods study. *Scandinavian Journal Of*

*Psychology*, 53(4), 360-367. doi:10.1111/j.1467-9450.2012.00953.x.

\* Garandeau, C. F., Poskiparta, E., & Salmivalli, C. (2014). Tackling acute cases of

school bullying in the KiVa anti-bullying program: A comparison of two approaches. *Journal Of Abnormal Child Psychology*, 42(6), 981-991.

doi:10.1007/s10802-014-9861-1.

\* Jones, S. M., Brown, J. L., Hoglund, W. G., & Aber, J. L. (2010). A school-randomized

clinical trial of an integrated social–emotional learning and literacy intervention:

Impacts after 1 school year. *Journal Of Consulting And Clinical Psychology*,

78(6), 829-842. doi:10.1037/a0021383.

\* Klein, G., Gasteiger-Klicpera, B., & Schillinger, M. (2009). Prevention of aggressive

behavior in elementary schools: Gender-related effects of a peer mediation

program. *European Journal Of Developmental Science*, 3(3), 304-311.

## AGGRESSIVE BEHAVIOR INTERVENTIONS

- \*Knox, L., Guerra, N. G., Williams, K. R., & Toro, R. (2011). Preventing children's aggression in immigrant Latino families: A mixed methods evaluation of the families and schools together program. *American Journal Of Community Psychology, 48*(1-2), 65-76. doi:10.1007/s10464-010-9411-0.
- Kokko, K., Tremblay, R. E., Lacourse, E., Nagin, D. S., & Vitaro, F. (2006). Trajectories of Prosocial Behavior and Physical Aggression in Middle Childhood: Links to Adolescent School Dropout and Physical Violence. *Journal Of Research On Adolescence, 16*(3), 403-428. doi:10.1111/j.1532-7795.2006.00500.x.
- Kratochwill, T. R., & Bergan, J. R. (1990). *Behavioral consultation in applied settings: An individual guide*. New York: Plenum Press.
- Kratochwill, T. R., Elliot, S. N., & Busse, R. T. (1995). Behavior consultation: A five-year evaluation of consultant and client outcomes. *School Psychology Quarterly, 10*(2), 87-117. doi: 10.1037/h0088299.
- \* Leff, S. S., Waasdorp, T. E., Paskewich, B., Gullan, R. L., Jawad, A. F., MacEvoy, J. P., & ... Power, T. J. (2010). The Preventing Relational Aggression in Schools Everyday Program: A preliminary evaluation of acceptability and impact. *School Psychology Review, 39*(4), 569-587.
- \* Leflot, G., van Lier, P. C., Onghena, P., & Colpin, H. (2013). The role of children's on-task behavior in the prevention of aggressive behavior development and peer rejection: A randomized controlled study of the Good Behavior Game in Belgian elementary classrooms. *Journal Of School Psychology, 51*(2), 187-199.

## AGGRESSIVE BEHAVIOR INTERVENTIONS

- Lewis, T. J., & Newcomer, L. L. (2002). Examining the efficacy of school-based consultation: Recommendations for improving outcomes. *Child & Behavior Therapy, 24*(1-2), 165-181. doi: 10.1300/J019v24n01\_11.
- Liabo, K., Gray, K., & Mulcahy, D. (2013). A systematic review of interventions to support looked-after children in school. *Child & Family Social Work, 18*(3), 341-353.
- Lipsey, M. W., & Wilson, D. B. (2001). *Practical meta-analysis*. Thousand Oaks, CA, US: Sage Publications, Inc.
- Litschge, C. M., Vaughn, M. G., & McCrea, C. (2010). The empirical status of treatments for children and youth with conduct problems: An overview of meta-analytic studies. *Research on Social Work Practice, 20*(1), 21-35. doi: 10.1177/1049731508331247.
- \* Lochman, J. E., Boxmeyer, C., Powell, N., Qu, L., Wells, K., & Windle, M. (2009). Dissemination of the Coping Power program: Importance of intensity of counselor training. *Journal Of Consulting And Clinical Psychology, 77*(3), 397-409. doi:10.1037/a0014514.
- Matjasko, J. L., Vivolo-Kantor, A. M., Massetti, G. M., & Holland, K. M. (2012). A systematic meta-review of evaluations of youth violence prevention programs: Common and divergent findings from 25 years of meta-analyses and systematic reviews. *Aggression and Violent Behavior, 17*(6), 540-552. doi: 10.1016/j.avb.2012.06.006.



## AGGRESSIVE BEHAVIOR INTERVENTIONS

- \* Menard, S., & Grotzinger, J. K. (2014). Evaluation of Bully-Proofing Your School as an elementary school antibullying intervention. *Journal Of School Violence, 13*(2), 188-209. doi:10.1080/15388220.2013.840641.
- Morris, S. B. (2008). Estimating effect sizes from pretest-posttest-control group designs. *Organizational Research Methods, 11*(2), 364-386. doi: 10.1177/1094428106291059.
- \* Muratori, P., Bertacchi, I., Giuli, C., Lombardi, L., Bonetti, S., Nocentini, A., Manfredi, A., Polidori, L., Ruglioni, L., Milone, A., & Lochman, J. E. (2015). First adaptation of Coping Power Program as a classroom-based prevention intervention on aggressive behaviors among elementary school children. *Prevention Science, 16*(3), 432-439. doi:10.1007/s11121-014-0501-3
- National Association of School Psychologists. (2010). *Model for Comprehensive and Integrated School Psychological Services, NASP Practice Model Overview*. [Brochure]. Bethesda, MD: Author.
- Patterson, G. R., & Yoerger, K. (1997). A developmental model for late-onset delinquency. In R. Dienstbier & D. W. Osgood (Eds.), *Motivation and delinquency* (Vol. 44, pp. 119–177). Lincoln: University of Nebraska Press.
- Perry, D. F., Allen, M. D., Brennan, E. M., & Bradley, J. R. (2010). The evidence base for mental health consultation in early childhood settings: A research synthesis addressing children's behavioral outcomes. *Early Education and Development, 21*(6), 795-824. doi: 10.1080/10409280903475444.

## AGGRESSIVE BEHAVIOR INTERVENTIONS

- Petrenko, C. L. M. (2013). A review of intervention programs to prevent and treat behavioral problems in young children with developmental disabilities. *Journal of Developmental and Physical Disabilities, 25*(6), 651-679. doi: 10.1007/s10882-013-9336-2.
- Reddy, L. A., Barboza-Whitehead, S., Files, T., & Rubel, E. (2000). Clinical focus of consultation outcome research with children and adolescents. *Special Services in the Schools, 16*, 1-22.
- Rosenthal, R. (1979). The “File Drawer Problems” and tolerance for null results. *Psychological Bulletin, 86*, 638-641. doi: 10.1037/0033-2909.86.3.638.
- Rothstein, H. R., Sutton, A. J., & Borenstein, M. (Eds.). *Publication bias in meta-analysis – prevention, assessment, and adjustments*. New York, NY: John Wiley & Sons.
- Schaeffer, C. M., Petras, H., Ialongo, N., Masyn, K. E., Hubbard, S., Poduska, J., & Kellam, S. (2006). A comparison of girls’ and boys’ aggressive–disruptive behavior trajectories across elementary school: Prediction to young adult antisocial outcomes. *Journal of Consulting and Clinical Psychology, 74*(3), 500–510.
- \* Schonert-Reichl, K. A., Oberle, E., Lawlor, M. S., Abbott, D., Thomson, K., Oberlander, T. F., & Diamond, A. (2015). Enhancing cognitive and social–emotional development through a simple-to-administer mindfulness-based school

## AGGRESSIVE BEHAVIOR INTERVENTIONS

program for elementary school children: A randomized controlled trial.

*Developmental Psychology*, 51(1), 52-66. doi:10.1037/a0038454.

Scruggs, T. E., Mastropieri, M. A., Berkeley, S., & Graetz, J. E. (2010). Do special education interventions improve learning of secondary content? A meta-analysis. *Remedial and Special Education*, 31(6), 437-449. doi: 10.1177/0741932508327465.

Sheridan, S. M. & Kratochwill, T. R. (2007). *Conjoint behavioral consultation: Promoting family-school connections and interventions* (2<sup>nd</sup> ed.). New York, NY: Springer.

Sheridan, S. M., Welch, M., & Orme, S. F. (1996). Is consultation effective? A review of outcome research. *Remedial and Special Education*, 17(6), 341-354.

Song, F., Easterwood, A., Gilbody, S., Duley, L. and Sutton, A.J. (2000) Publication and other selection biases in systematic reviews. *Health Technology Assessment*, 4(10).

\* Stoltz, S., Prinzie, P., De Haan, A., van Londen, M., De Castro, B. O., & Deković, M. (2013). Child personality as moderator of outcome in a school-based intervention for preventing externalising behaviour. *European Journal Of Personality*, 27(3), 271-279.

\* Stoltz, S., van Londen, M., Deković, M., de Castro, B. O., Prinzie, P., & Lochman, J. E. (2013). Effectiveness of an individual school-based intervention for children with

## AGGRESSIVE BEHAVIOR INTERVENTIONS

aggressive behaviour: A randomized controlled trial. *Behavioural And Cognitive Psychotherapy*, 41(5), 525-548. doi:10.1017/S1352465812000525.

Van Garderen, D., Stormont, M., & Goel, N. (2012). Collaboration between general and special educators and student outcomes: A need for more research. *Psychology in the Schools*, 49(5), 483-497. doi: 10.1002/pits.21610.

\* Visser, M., Kunnen, S. E., & van Geert, P. C. (2010). The impact of context on the development of aggressive behavior in special elementary school children. *Mind, Brain, And Education*, 4(1), 34-43. doi:10.1111/j.1751-228X.2009.01081.x.

Whear, R. R., Thompson-Coon, J. J., Boddy, K. K., Ford, T. T., Racey, D. D., & Stein, K. K. (2013). The effect of teacher-led interventions on social and emotional behaviour in primary school children: A systematic review. *British Educational Research Journal*, 39(2), 383-420.

Wilson, D. B., Gottfredson, D. C., & Najaka, S. S. (2001). School-based prevention of problem behaviors: A meta-analysis. *Journal of Quantitative Criminology*, 17(3), 247-272.

Wilson, S. J., Lipsey, M. W., & Derzon, J. H. (2003). The effects of school-based intervention programs on aggressive behavior: A meta-analysis. *Journal of Consulting and Clinical Psychology*, 71(1), 136-149. doi: 10.1037/0022-006X.71.1.136.

## AGGRESSIVE BEHAVIOR INTERVENTIONS

Wilson, S. J. & Lipsey, M. W. (2007). School-based interventions for aggressive and disruptive behavior: Update of a meta-analysis. *American Journal of Preventative Medicine*, 33(2S), S130-S143. doi: 10.1016/j.amepre.2007.04.011.