



Systematic reviews of the effectiveness of developmental prevention programs in reducing delinquency, aggression, and bullying



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ABSTRACT

The main aim of this article is to identify systematic reviews of the effects of developmental prevention programs. These programs are defined as community-based programs designed to prevent antisocial behavior, targeted on children and adolescents, and aiming to change individual, family, or school risk factors. Only evaluations that reported effects on the outcomes of delinquency, offending, violence, aggression, or bullying were included. In total, 50 systematic reviews were assessed: five general reviews, 11 reviews of individually focused interventions, nine reviews of family-based programs, and 25 reviews of school-based programs. It was possible to calculate effect sizes from 33 reviews. Every summary odds ratio effect size was greater than 1, indicating that all types of programs were effective. The effect size was statistically significant in all except four cases. The median effect size was 1.46, which corresponds (on some reasonable assumptions) to a decrease in aggression of about one quarter. This article makes recommendations about how to improve systematic reviews and concludes that more investment in developmental prevention is warranted.

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1. Introduction

The main aim of this article is to identify systematic reviews of the effects of developmental prevention programs on offending outcomes. These programs are defined as community-based programs designed to prevent antisocial behavior, targeted on children and adolescents, and aiming to change individual, family, or school risk factors. These programs can be distinguished from situational or physical prevention programs and from criminal justice prevention based on deterrence, rehabilitation, or incapacitation.

Over the last decades numerous developmental prevention programs have been implemented in families, kindergartens, schools, family education centers, child guidance clinics and other contexts to reduce risk factors and strengthen protective factors in child development. Many programs focus on individual children or youth by providing training in social competencies, interpersonal problem solving, and other behavioral or cognitive skills. Other programs concentrate on the family by providing training in parenting skills, counseling on child-rearing, or coping with family stress. School-oriented programs address issues of school and class climate, the origins of bullying, and authoritative teacher behavior.

Systematic reviews are superior to the more common narrative reviews because they have explicit objectives, explicit criteria for inclusion or exclusion of studies, and searches for studies that are

designed to reduce potential bias. This article aims to update a previous assessment of systematic reviews of developmental prevention by [Farrington, Ttofi, and Lösel \(2016\)](#). The main difference is that the previous review was based on systematic literature searches up to the end of 2012, whereas the present review is based on systematic literature searches from January 1, 2012 to March 31, 2016.

There are other appraisals of systematic reviews of developmental prevention programs. For example, [Lösel \(2012\)](#), in a German language article, reviewed 22 meta-analyses of developmental prevention programs. Some of these are not included in this article because they do not report results for one of our outcomes, but only for antisocial behavior. [Ttofi, Eisner, and Bradshaw \(2014\)](#) discussed six systematic reviews of bullying prevention programs. Five of these (all except [Baldry & Farrington, 2007](#), which was superseded by [Farrington & Ttofi, 2009](#)) are included in this article. [Butler, Chapman, Forman, and Beck \(2006\)](#) reviewed meta-analyses of cognitive-behavioral treatment programs. [Beelmann and Raabe \(2009\)](#) synthesized meta-analyses on the prevention of antisocial behavior and crime in childhood and adolescence, and [Matjasko et al. \(2012\)](#) reviewed meta-analyses of youth violence prevention programs. Also, [Welsh and Rocque \(2014\)](#) studied Campbell Collaboration systematic reviews to discover harmful effects of prevention programs.

These evaluations of systematic reviews of developmental prevention programs revealed generally desirable effects. However, they also showed substantial differences in the mean effect sizes and also variations with regard to moderating effects (e.g. versus sample size, length of follow-up, universal versus indicated prevention). The

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differences in the findings were partly caused by differences in the types of programs, outcome criteria, and the quality of primary studies in the systematic reviews. It was noticeable that systematic reviews conducted under the auspices of the Campbell Collaboration (see e.g. [Farrington, Weisburd, & Gill, 2011](#)) generally had higher methodological quality than other systematic reviews (and the same was true of systematic reviews on medical and health topics conducted under the auspices of the Cochrane Collaboration). This is probably because the Campbell and Cochrane Collaborations set high standards and have rigorous refereeing of systematic reviews.

2. Method

The inclusion criteria for our review were as follows:

1. The report describes a systematic review and/or a meta-analysis. A systematic review has explicit inclusion/exclusion criteria and explicit information about searches that were carried out. A meta-analysis specifies effect sizes and reports a summary effect size. Systematic reviews that yielded no includable studies – so-called “empty” reviews (e.g. the Campbell Collaboration reviews by [Fisher, Montgomery, & Gardner, 2008a, 2008b](#)) – were excluded.
2. The report summarizes individual, family, or school programs targeted on children and adolescents in the community. We classified programs that targeted individual risk factors in schools as individual programs. Because some high quality reviews included adolescents aged up to 21 (e.g., [Wilson & Lipsey, 2000](#); [Wilson, Lipsey, & Soydan, 2003](#)), we did not limit adolescence strictly to age 18. Clinic and institutional programs are excluded, but a few high quality reviews of community-based programs that included a minority of clinic or institutional programs (e.g., [Sukhodolsky, Kassinove, & Gorman, 2004](#); [Wilson et al., 2003](#)) were included in our review. Mentoring programs were excluded because they were recently reviewed by [Gill \(2016\)](#). We also excluded reviews of juvenile correctional treatment (e.g., [Garrett, 1985](#); [Koehler, Lösel, Akoensi, & Humphreys, 2013](#); [Lipsey, 2009](#); [Walker, McGovern, Poey, & Otis, 2008](#)).
3. The report summarizes effects on one or more outcomes of delinquency, offending, violence, aggression, or bullying. We included high quality reviews that primarily focused on one or more of our outcomes but also included studies of other (disruptive or antisocial behavior) outcomes (e.g., [Mytton, DiGuseppi, Gough, Taylor, & Logan, 2002](#); [Park-Higgerson, Perumean-Chaney, Bartolucci, Grimley, & Singh, 2008](#); [Wilson & Lipsey, 2000, 2007](#)). We excluded reports focusing on substance abuse outcomes because these were recently reviewed by [Holloway and Bennett \(2016\)](#).
4. We excluded earlier reviews that were superseded by later reviews (by the same authors), reviews not published in English, and reviews that did not report outcomes separately (e.g., for juveniles versus adults, or for offending versus antisocial behavior). We searched Google Scholar, PsycINFO, Web of Science, Education Resources Information Center (ERIC), Criminal Justice Abstracts, and Scopus from 2012 to the end of March 2016, using the following key words: systematic review/meta-analysis, prevention, and delinquen*/offend*/violen*/aggress*/bully*. These database searches identified 1255 reports, and their abstracts were screened for eligibility. In total, 145 full-text reports were read for further screening, yielding 17 additional reviews that were included.

3. Results

[Table 1](#) summarizes 95 systematic reviews that were obtained and screened in the present searches, but did not meet our inclusion criteria. In most cases, these reviews were excluded because they did not provide specific information about one of the outcomes of interest. [Farrington et al. \(2016\)](#) listed systematic reviews that were screened and obtained in their search up to the end of 2012 but were excluded.

[Table 2](#) lists the key features of all the systematic reviews that met our inclusion criteria (including those reviewed by [Farrington et al., 2016](#)). The analysis by [Farrington et al. \(2016\)](#) was based on 33 reviews, whereas the present analysis is based on 50 reviews: five reviews of general prevention programs, 11 reviews of individual programs, nine reviews of family programs, and 25 reviews of school programs. It is interesting that there have been so many systematic reviews of school programs compared to the other types of programs.

A mean effect size was reported in 33 reviews. [Table 3](#) summarizes these mean effect sizes in each review, and their associated confidence intervals (CI), where these were reported. Our aim was to convert each effect size into an odds ratio (OR), with OR values greater than 1 indicating an effective program. For example, we used the conversion equation $\text{Ln}(\text{OR}) = d / 0.5513$. Where there were two or more effect sizes, a summary effect size was calculated by inversely weighting each effect size by its variance. This is based on the assumption of independence of effect sizes, which may not always be true. To the extent that effect sizes are not independent, confidence intervals would be wider.

The good news is that every summary effect size was greater than 1, indicating that every type of prevention program was effective. Furthermore, in the 29 cases where it was possible to calculate confidence intervals, the effect size was statistically significant in all except four cases: [Suter and Bruns \(2009\)](#), [Littell \(2008\)](#), [Park-Higgerson et al. \(2008\)](#), and [Wilson, Gottfredson, and Najaka \(2001\)](#). The median OR was 1.46 and the interquartile range was from 1.24 to 1.65. It is not appropriate to carry out a meta-analysis of these ORs because they are not all independent; in quite a few cases, the same evaluation was included in more than one systematic review.

In some cases, nonstandard methods were used to calculate a summary effect size. For example, [Robinson, Smith, Miller, and Brownell \(1999\)](#) and [Sukhodolsky et al. \(2004\)](#) calculated the simple arithmetic mean of the effect sizes, not weighting them inversely according to their variances, as recommended in meta-analysis. According to [Wilson \(2016\)](#), this makes it impossible to calculate a valid standard error for the mean effect size. Both reviews reported relatively large mean effect sizes (corresponding to $\text{OR} = 3.19$ and 3.14 respectively) which cannot necessarily be attributed to the method of calculation. If these reviews had been excluded, this would have had very little effect on the median OR, which would have changed only from 1.46 to 1.44.

The median OR was 1.52 in the individual reviews, 1.79 in the family reviews, and 1.22 in the school reviews. While the number of reviews was too small to draw definite conclusions, these results suggest that the family-based interventions may have been the most effective, while the school-based interventions may have been the least effective. However, this tendency may also have been caused by a larger proportion of universal programs in school-based prevention, since these often show smaller effects than risk-based selective or indicated interventions (e.g. [Lösel, 2012](#); [Wilson & Lipsey, 2007](#)).

[Farrington et al. \(2016\)](#) provided descriptions of all included studies. In this article, we present descriptions of the seven new reviews that reported weighted mean effect sizes. Most of the new studies did not report such effect sizes. The reviews are described in order of their appearance in [Table 2](#).

3.1. General prevention programs

[De Vries, Hoeve, Assink, Stams, and Asscher \(2015\)](#) aimed to investigate the effective ingredients of prevention programs for youth at risk for persistent delinquent behavior. They reviewed 39 experimental and quasi-experimental studies. The overall mean effect size Cohen's $d = 0.235$. Since $z = 3.73$, it follows that the standard error (SE) of this d value was 0.063 (since $z = d / \text{SE}$). They investigated how the effect size varied with features of the programs, and concluded that behavioral programs, focusing on parenting skills training, behavioral modeling, or behavioral contracting were associated with the largest effect sizes.

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