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What we know, and what we need to find out about universal, school-based social and emotional learning programs for children and adolescents: A review of meta-analyses and directions for future research

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Abstract

This article reviews 12 meta-analyses of universal, school-based social and emotional learning (SEL) programs for children from early childhood education through high school. The aims were to assess the breadth and consistency of outcomes across meta-analyses, and the potential influence of different moderators (i.e., individual, programmatic, ecological, and methodological) on program impacts. Collectively, the meta-analyses were rated to be high quality, and included 524 unique reports conducted in many countries and involving an estimated one million students. Mean effects were consistently statistically significant across reviews on a range of outcomes including increased SEL skills, attitudes, prosocial behaviors, and academic achievement, and decreased conduct problems and emotional distress (post d s ranged from 0.09 to 0.70 and follow-up d s ranged from 0.07 to 0.33 depending on the outcome and the specific review). However, there was little consistency regarding the moderators examined, or findings when the same moderators were assessed across reviews. Moreover, there is little information on possible interactions between moderators. Research has yet to clarify which individual, contextual, methodological, and programmatic variables promote or hinder the development of different SEL skills for diverse school-aged children and youth. Recommendations to guide future research in identifying the conditions and mechanisms by which SEL programs are most effective are provided.

Public Significance Statement

This review of 12 meta-analyses, involving an estimated one million students from early childhood education through high school, shows that social and emotional learning (SEL) programs have consistent, positive impacts on a broad range of student outcomes including increased SEL skills, attitudes, prosocial behaviors, and academic achievement, and decreased

conduct problems and emotional distress. However, there is little consistency regarding conditions and mechanisms by which these programs are most effective. By summarizing the substantial evidence base for SEL programs, and offering recommendations for future work, this paper will stimulate more research and practice related to such initiatives.

Keywords: social and emotional learning, SEL, evidence, meta-analysis, moderators

What we Know, and What we Need to Find out about Universal, School-based Social and Emotional Learning Programs for Children and Adolescents:

A Review of Meta-analyses and Directions for Future Research

Social and emotional learning (SEL) can be broadly defined as the “process through which all young people and adults acquire and apply the knowledge, skills, and attitudes to develop healthy identities, manage emotions and achieve personal and collective goals, feel and show empathy for others, establish and maintain supportive relationships, and make responsible and caring decisions” (CASEL, 2020; Niemi, 2020). SEL aims to develop students’ *social and emotional competence* (SEC), which involves the capacity to coordinate cognition, affect, and behavior so that individuals can thrive in diverse cultures and contexts and achieve specific tasks and positive developmental outcomes (Mahoney et al., 2021). There is widespread agreement that an intentional focus on both *intrapersonal skills and attitudes* (i.e., self-awareness and self-management), and *interpersonal skills and attitudes* (i.e., social awareness and relationship skills) are important.

SEL programs refer to a carefully coordinated curriculum organized into developmentally sequenced units and learning experiences that focuses on creating relationally healthy places for children and adults to develop the knowledge, attitudes, and skills directly tied, explicitly and intentionally, to the SECs. SEL programs can be organized in different ways including standalone classroom instruction, integration of SEL with academic curricula, and whole school approaches. There is strong and growing demand for these programs from educators, parents, students, and employers (e.g., Atwell & Bridgeland, 2019; DePaoli et al., 2018; Domitrovich et al., 2017; National Commission on Social, Emotional, and Academic Development, 2018; Phi Delta Kappan, 2021). Indeed, interventions that promote young people’s SECs have become

popular and supported by educational practice and policy. Thousands of schools within and outside the United States have implemented some form of SEL programming. Most U.S. states, as well as many countries around the world, have created explicit learning standards related to SEL in the belief that social and emotional development is an important part of all students' education (e.g., Dusenbury et al., 2020).

More recently, in light of the Covid-19 pandemic, the mental health needs of young people have reached a crisis (American Psychology Association, 2022; American Academy of Pediatrics, American Academy of Child and Adolescent Psychiatry and Children's Hospital Association, 2021). School-based SEL programs are viewed as a promising way to promote students' behavioral and emotional well-being and prevent problems. As a result, new federal, state, and local funding is available to schools and districts to implement SEL programs. For example, U.S. federal funding can be used to support SEL programming under the *Coronavirus Aid, Relief, and Economic Security (CARES) Act of 2020* (U.S. Department of the Treasury, 2022), the *American Rescue Plan (ARP) Act of 2021* (The White House, 2021), and the *Coronavirus Response and Relief Supplemental Appropriations (CRRSA) Act of 2021* through the *Elementary and Secondary School Emergency Relief (ESSER II) Fund* (Office of Elementary and Secondary Education, 2022).

The growing popularity of school-based SEL school programs has led to several noteworthy developments in the field over the past 10-15 years. Several of these developments are mentioned here and discussed more extensively elsewhere as noted below. For example, although many interventions emphasize the promotion of personal and social skills using CASEL's description of five competency domains, other frameworks have been developed to categorize skills and identify which may be important in different circumstances (Berg et al.,

2017). The composition of school-based programs has varied and at least 12 major components of school-based interventions have been identified (Jones et al. 2021; e.g., attempts to improve classroom climate, and activities beyond core classroom lessons). Implementation science has confirmed the notion that effective implementation is a critical component of successful programs and has widened understanding of the many factors that can influence program implementation and sustainability (Shoesmith et al. 2021). Equity has become an important issue in education so it is important for universal approaches to develop inclusive and culturally affirming learning environments and to ascertain whether and if some students may benefit more than others (e.g., Cipriano et al., 2022; Jagers et al., 2019). A systemic SEL approach to school-based programs has emphasized how multiple ecological factors operating at individual, organizational, and societal levels can interact to influence program outcomes in both the short and long term (Mahoney et al., 2021). These factors include school leadership, the social and emotional development of program providers, the quality of professional training and assistance that is offered, funding, and coordination and collaboration among multiple stakeholders.

Systemic SEL emphasizes a *universal* approach to SEL where all students and adults in the setting are engaged in a coordinated learning process. This approach is practical from an educational standpoint of learning time and the ability to integrate SEL with other academic subjects. Universal approaches also reduce the likelihood for stigma because they do not single out students and successful programs can be cost-effective from a public health perspective (Greenberg et al., 2017). Universal and targeted (i.e., Tier 2 and Tier 3) approaches to SEL are compatible and can be integrated to support the needs of individuals and small groups of students (e.g., Bradshaw et al., 2014; Elias, et al., 2015).

The above interrelated developments that have more recently occurred within the SEL field can be summarized in terms of what is targeted (i.e., which skills), how the program is conceptualized or structured (i.e., through various program components and curriculum structure), for whom is it targeted (e.g., all students, or groups of students based on characteristics or needs), how well is it targeted (i.e., effective implementation), and which ecological settings and factors are targeted (e.g., what is the influence of learning climate, staff, leadership, and educational policy in which contexts). Taken together, the growing interest in and influence of SEL intervention programs aimed at promoting student's SECs requires a careful examination of the research evidence both in terms of what outcomes are associated with interventions and what factors may moderate student outcomes. An extensive meta-analysis of more recent SEL programs is underway to investigate some of the issues mentioned above (Cipriano et al., in principle acceptance). We focus on the meta-analyses reported so far.

Focus and Aims of the Current Review

This review focuses on universal, school-based SEL programs for children and adolescents ranging from early childhood education through Grade 12 that assess SEL programming's impact on student adjustment or well-being. By considering multiple meta-analytic reviews of SEL programs, our four-fold interest is to report on the: (1) post and follow-up outcomes of SEL programs, (2) moderators of SEL programs outcomes, (3) strength and consistency of the current research evidence, and (4) gaps or neglected areas of research that require further attention.

Our first aim is to present the main outcomes from multiple meta-analyses of universal, school-based SEL programs published over the past decade. The literature on outcomes of SEL program participation has grown exponentially in recent decades (e.g., Durlak et al., 2015). Since

publication of the first meta-analysis of student outcomes associated with universal, school-based SEL programs (i.e., Durlak et al., 2011), several others have appeared, reporting short- or longer-term impacts on students. The various reviews have considered different types of programs, outcomes, developmental stages, time periods, and country of implementation. At the present time, no comprehensive effort exists to summarize the growing meta-analytic evidence on preschool through high school SEL outcomes.

Our second aim is to identify and summarize which moderators have been examined in existing meta-analytic reviews and with what results. Because SEL programs have varied on many factors, such as which specific skills are targeted, the length and content of the intervention, who delivers the program, how well it is implemented, which outcomes are of interest, and in the rigor with which each program has been evaluated, it is reasonable to expect that SEL programs would vary in their effects. Accordingly, we sought to identify the moderators examined in meta-analytic reviews and their association with program outcomes. Given the diversity of potential moderating factors, we organized them into five main categories: (a) *individual characteristics*, including age, race/ethnicity, and gender; (b) *program features* (i.e., how the program is carried out), including implementation fidelity, quality, and duration; (c) *program components* (i.e., what the program contains, including curriculum, intensity, systemic approach; (d) *social-ecological aspects*, including rural or urban school location, country of study; and (e) *methodology*, including study design, publication status, information source, and reliability/validity of outcome measures.

Our third, and final, aim is to describe the extent to which the results of meta-analyses have been consistent across reviews, or indeterminate because of inconsistent or equivocal findings, and identify research gaps that merit future exploration. Summarizing the current

evidence in these ways should suggest important guidance for future SEL research, policy, and practice.

Hypotheses

The goal of our first research aim was to summarize the main effects of the studied SEL programs. We hypothesized that SEL programs would yield consistently significant and positive effects across multiple domains (e.g., social, emotional, academic) at post-test analyses. Building off this initial research question, our second aim focused on understanding programs' follow-up effects. We hypothesized that programs would yield significant positive effects across the same outcomes at follow-up that were significant at post-test, although we expected the magnitude of effect sizes to be smaller at follow-up than post-test. We did not expect every outcome under study to reach statistical significance in every review at post-test and or follow-up, but did expect to find consistent evidence from the reviews that SEL programs are associated with improvements in young people's adjustment across multiple domains.

Our second research aim was to examine and summarize the impact of various moderators in the meta-analytic studies. There was great diversity in not only the moderators analyzed in the different studies, but also in *how* they were studied; in some cases, moderators might be examined in an exploratory manner without a strong conceptual or empirical basis. Additionally, given that it is difficult to predict *a priori* which specific moderators would emerge as significant, we do not offer specific hypotheses. Nevertheless, considering the general features of analyses that we assumed would be examined, we expected that evidence would emerge in multiple meta-analyses that some characteristics of the participants (e.g., age, gender, race/ethnicity), the interventions (e.g., targeted skills, number or type of specific program

components, implementation quality), and study methodology (e.g., publication status, type of experimental design, sample size) would significantly influence student outcomes.

Method

Transparency and Openness Statement

This article was prepared to follow the transparency and openness guidelines adopted by this Journal. All eight standards have been met. This review was not preregistered and is not a replication. All original data developed in this article are available in supplementary materials as are more complete details on our search procedures.

Inclusion and Exclusion Criteria

Guidelines for conducting a review of meta-analyses parallel several of the same steps involved in conducting an individual meta-analysis, such as thorough search procedures that span both published and unpublished resources and clear specification of inclusion and exclusion criteria (Cooper & Koenka, 2012). When information is drawn from multiple meta-analyses, Cooper and Koenka (2012) have stressed the importance of considering the quality of each review, as well as the potential duplication of evidence that might arise when different reviews contain overlapping groups of studies.

Inclusion criteria. To be included in our review, a meta-analysis had to: (a) assess SEL programs whose primary purpose was to enhance students' personal *and* social development by emphasizing the development of one or more SEL skills that fell into the categories of social and emotional competence; (b) evaluate the outcomes of universal, school-based programs for children and adolescents who were enrolled in early childhood education or preschool centers, or were in kindergarten through Grade 12; (c) conduct an evaluation involving randomized or quasi-experimental group designs, (d) conduct moderator analysis of at least one variable; (e)

appear from 2011 through the end of 2020 (reviews *in press* at the end of 2020 were also considered); and (f) be written in English. Programs conducted in any country were eligible for inclusion. The meta-analysis could be a general evaluation of different types of SEL programs (e.g., stand-alone classroom programs), be focused on only one program (e.g., Second Step™), or address a unique research question vis-a-vis the other reviews, such as collecting data on specific outcomes (e.g., emotional distress) or focus on only one specific type of school program (e.g., whole school programs).

Exclusion criteria. We excluded those meta-analyses focused on community-based or out-of-school time programs, correlational meta-analyses that did not evaluate SEL interventions, and overviews, commentaries, and systematic or narrative reviews that did not involve any meta-analytic assessments. Consistent with the CASEL (2022) *Program Guide*, mindfulness-focused programs were excluded because, except with very rare exceptions, these efforts focus on the development of intrapersonal, but not interpersonal skills. Mindfulness programs most frequently focus on increasing self-awareness or self-management, but usually lack intentional or sustained strategies to develop students' social awareness, relationships skills, and or responsible decision-making. We also excluded reviews that involved some SEL and some non-SEL programs but did not conduct separate outcome and moderator analyses of universal school-based SEL initiatives (i.e., reviews that combined universal with Tier 2 or Tier 3 programs, or with school- and community-based interventions).

Search Procedures

We used multiple methods to locate relevant published or unpublished meta-analyses appearing between January 1, 2011 (when the first relevant meta-analysis appeared; Durlak et al., 2011) through December 31, 2020. We conducted electronic searches in the following

databases: *PsychInfo*, *PubMed*, *Web of Science*, and *Google Scholar* on December 31, 2020. For example, for *PsychInfo* we first used *meta-analysis* and *social and emotional learning* as search terms and then completed a second round of searches using the terms *review*, *school*, *intervention or program*. Each search was coupled with *preschool*, *elementary school*, or *high school* as modifiers. We also inspected the table of contents of eight school, education, and psychology journals, as well as six additional journals or organizations that specialize in reviews (e.g., *Psychological Bulletin*, *Clinical Psychology Review*, *Clinical Child and Family Review*, *Systematic Reviews*, and the *Campbell Collaboration*, and *What Works Clearinghouse* libraries). See supplemental materials for more details on our search procedures. Papers in press and those available online as of December 31, 2020, were also considered. These searches identified a total of 3,319 total entries and 2,968 unique entries and we inspected the titles and abstracts and eliminated the overwhelming number of unique entries ($\underline{n} = 2,925$) because they were not meta-analyses ($\underline{n} = 2,729$), did not assess universal or school-based interventions ($\underline{n} = 38$), or were directed at other topics such as academic instruction, physical health issues, or prevention (e.g., physical activity, nutrition, weight, obesity or prevention of anxiety or depression, $\underline{n} = 115$) leaving a sample of 43 potentially eligible reports.

After initial screening by one author, a second author independently examined the titles and abstracts from the database searches to check if any potentially relevant meta-analyses were omitted. When the list of 43 potentially relevant meta-analyses was examined for final inclusion, two of the authors independently agreed on the final set of 12 without any disagreements. From the sample of 43 possible meta-analyses, we excluded 31 (72%) because the authors did not conduct outcome and moderator analyses of universal, school-based SEL programs. As shown in Figure 1, the final sample of 12 meta-analyses included were: Blewitt et al., 2018; Boncu et al.,

2017; Durlak et al. 2011; Goldberg et al., 2019; January et al., 2011; Luo et al., 2020; Moy et al., 2018; Sklad et al., 2012; Taylor et al., 2017; van de Sande et al., 2019; Wigelsworth et al., 2016; Yang et al., 2019.

Assessment of Meta-Analysis Quality

Meta-analyses can vary in quality just like any other research methodology. We used a coding system that has been used in several disciplines to evaluate the quality of the included meta-analyses (National Institute of Justice, 2019). The instrument consists of ratings suggesting how well the meta-analyst conducted and reported on 12 important steps in a meta-analysis, each rated on a 2 or 3-point scale depending on the item. These ratings are then weighted, with greater weight given to steps such as reporting clear inclusion and exclusion criteria, examining the influence of methodological factors, calculating effects and appropriate statistical analyses, and literature search procedures, and less weight assigned to efforts to detect potential outlier effect sizes and assess possible publication bias. This instrument first operationally defines the criterion for successfully completing a major step in a meta-analysis and then provides examples and explanations that guide the rater in determining how adequately each step was accomplished. For example, for the item relating to study eligibility, the criterion is that the author must provide a clear, detailed statement of the inclusion and exclusion criteria and possible ratings are 1=cannot tell; 2= vague or incomplete criteria, or 3 = clear criteria (i.e., the meta-analysis clearly defines what types of studies were included or excluded). The weighting of different items is such that total scores could range from 10 to 30 on this instrument with values from 10 to 16 suggesting low-quality, 17 to 23 suggesting medium quality, and 24-30 suggesting high quality.

One author coded the 12 included meta-analyses, and five reviews (42%) were randomly selected and independently coded by a second author. High reliability was obtained using the

exact agreement method (i.e., 94%) and the few disagreements were resolved through discussion. We also examined the overlap occurring in the primary studies included in the 12 included meta-analyses using the corrected covered area (CCA) index developed by Pieper et al. (2014).

Results

Table 1 contains the main features of each included meta-analysis, such as educational levels examined, number of primary studies assessed, and the quality score each received based on our coding procedures. All 12 meta-analyses presented data on the major outcomes of SEL programs involving preschool through high school samples. Of these, three examined specific research questions. Supplemental materials provide additional information on the outcomes and moderators included in each meta-analysis.

The scores in the final column of Table 1 evaluating the quality of the 12 meta-analyses reflect that this group of reviews were carefully done. Ten received scores indicative of high-quality (i.e., scores > 24), with four receiving the maximum score of 30, and two were of medium-quality (i.e., Boncu et al., 2017, January et al., 2011). None received ratings reflecting low-quality. These quality scores do not mean that these meta-analyses were without limitations and the individual qualifications offered by each meta-analyst should be considered. Some of these limitations are discussed below. Collectively, these scores suggest that the included studies and their findings offer reasonable evidence for program outcomes, particularly if findings are replicated across reviews.

Applying the CCA index to the 12 meta-analyses yielded an overlap of only 3% which, according to the guidelines offered by Pieper et al. (2014), suggests only a slight overlap among the reviewed studies. This slight overlap is likely due to the collected reviews targeting different types of SEL programs and age levels and searching over different time periods. There were 524

unique references across the 12 meta-analyses. Eleven of the included meta-analyses reported the total sample of students evaluated and eight reported the number of studies conducted outside the U.S. or North America. Calculations subtracting 3% (Pieper et al., 2014) of the numbers due to overlap yielded a conservative estimate of over one million students involved in the SEL outcome studies (i.e., $N = 1,032,825$) with studies conducted outside of the U.S. or North America involving an estimated 305,383 of students. Overall, the text and tables from the 12 meta-analyses reported studies conducted in 24 nations encompassed by 11 broader geographic regions (e.g., Asia, Central America, South Africa). This geographic information is provided in the supplemental materials for each meta-analysis.

We also applied the CCA index separately to the three meta-analyses that explored follow-up effects (i.e., Durlak et al., 2011, Skad et al., 2012, Taylor et al., 2014). This yielded moderate overlap of 10% according to the Pieper et al. guidelines. The three follow-up meta-analyses evaluated 109 different studies. However, even for the pair with the highest overlap (i.e., Durlak et al., 2011, Taylor et al., 2017), 220 of the 262 (84%) referenced studies included in these two meta-analyses were unique.

Outcomes from Meta-analyses of SEL programs

First, we describe the findings from the nine meta-analyses whose aim was to evaluate primary outcomes from SEL programs. For all results, positive values for mean effects (calculated as Hedges' g , or Cohen's d) signify desired improvement on all indices of positive adjustment (i.e., increase in positive behaviors and decrease in negative behaviors). Table 2 summarizes the findings at post-test reported for the nine meta-analyses that examined interventions conducted in early childhood educational settings or in kindergarten through Grade 2. Collectively, these analyses evaluated 524 unique reports involving an estimated one million

students (with approximately two-thirds of the studies conducted within the United States, and one-third in other countries).

Outcome data were categorized into nine different outcome categories. Several meta-analyses combined outcomes into similar categories, but a few studied a unique outcome category compared to the others. More details on the outcomes for each review are provided in the supplemental materials. Across the 12 included meta-analyses and all types of outcomes, statistically significant outcomes were reported in 44 of 45 instances, although the magnitude of the effects varied across reviews. Across the meta-analyses that evaluated the same outcomes, significant effects were consistently found for SEL skills in eight reviews, prosocial behavior in five reviews, attitudes in four reviews, conduct problems in five reviews, academic performance in four reviews, and emotional distress in five reviews. The two reviews focused on evaluating emotional competence each reported significance (Blewitt, et al., 2018; Wigelsworth et al., 2016). Sklad et al. (2012) was the only review to assess drug use at post-test, and this outcome was also significantly favorable.

Table 3 summarizes the follow-up results reported in three meta-analyses (i.e., Durlak et al., 2011, Skad et al., 2012, Taylor et al., 2014). At follow-up, 100% (20 of the 20 tests) of the outcomes emerged as significant, and these outcome categories were similar to those evaluated at post-test (i.e., SEL skills, attitudes, prosocial behavior, behavior problems, emotional distress, drug use, and academic performance). These follow-up studies examined a total of 109 unique reports and, based on available information from Durlak et al. (2011) and Taylor et al. (2017), approximately 22% were conducted outside the United States (Sklad et al., 2012 provided geographic location by continent, not country).

These results provide consistent evidence replicated across multiple meta-analyses conducted at different time points and by different groups of investigators in support of our first two hypotheses that universal, school-based SEL programs would yield significant improvements on a variety of indices related to students' personal, social, and academic adjustment at both post-test and follow-up.

Outcomes of Meta-Analyses with Special Research Questions

Table 4 presents outcomes for three meta-analyses that address specific research questions regarding SEL programs (Goldberg et al., 2018; Moy et al., 2018; van de Sande et al., 2019) in addition to any attention on general outcomes. Goldberg et al. (2018) evaluated 45 studies involving 496,299 participants of whole school SEL approaches. These whole school programs were coordinated activities that involved several different components. Whole school efforts typically include consistent opportunities to practice SEL skills during the entire school day, and the skills are reinforced and supported through mechanisms such as staff training, school policies, and promotion of a positive school climate. Although these whole school approaches did not significantly improve academic achievement, they did yield significant improvements in social and emotional development, behavioral adjustment, and emotional distress (d s between 0.10 to 0.22).

van de Sande and colleagues (2019) were primarily interested in assessing the extent to which social and emotional skills targeted in 40 SEL programs for adolescents were modified through intervention, and secondarily interested in the different outcomes achieved in these programs. In the latter case, significant positive effects were obtained for reductions in depression, anxiety, aggression, and drug use, paralleling the positive results of the other meta-analyses. The researchers also found that mean effects for skills related to self-awareness, social

awareness, self-management, relationship skills, and responsible decision-making domains were all significant ($d_s \geq 0.24$). However, they noted that only 5 of 40 (13%) programs measured changes in all the skill categories that were targeted in the various SEL interventions. When they compared the number of programs that evaluated targeted skills falling into the different domains noted above, they found that only 43% measured any changes in self-management, 31% assessed self-awareness, 28% evaluated social awareness, 27% evaluated decision making, and 22% examined social awareness.

The third meta-analysis in Table 4 (Moy et al., 2018) concentrated on the outcomes of Second Step™ (Committee for Children, 2021), a prominent intervention with programmatic offerings ranging from preschool through Grade 8. Second Step™ yielded significant effects for knowledge about the program, and prosocial behaviors, but the mean effects for reduction in antisocial behavior were not significant.

Moderator Analyses of SEL Program Outcomes

Table 5 summarizes the findings from the moderator analyses conducted in the 12 meta-analyses. Table 5 is divided into five major sections according to which moderators were examined: (1) those involving individual student characteristics, (2) features relating to how the program was delivered, (3) program components, (4) social ecological factors, and (5) various methodological issues. The data in Table 5 list the number of meta-analyses assessing, or not assessing, each moderator and the subsequent findings, including the number of outcomes that were examined in tests of moderation. Supplemental materials provide more details on which outcomes were assessed in each moderator analyses. With few exceptions, the overall data indicated there is not much consistency in either which variables were tested for moderation or the results.

Individual Student Characteristics

Student age was one of the few variables evaluated with consistency across the meta-analyses (i.e., 11 of the 12 meta-analyses tested age as a moderator); however, the findings were inconsistent. Five meta-analyses reported that age was a significant moderator for five of eight outcomes (and in each case, younger students benefited more than older students). In the other six meta-analyses, age was not a significant moderator across 23 outcomes that were examined.

Only five meta-analyses examined the moderating role of students' race/ethnicity and reported that these characteristics of the student participants were not a significant moderator. Socioeconomic status (SES) was tested in three meta-analyses; none of the three found SES was significant. Only three meta-analyses explored the moderating role of gender, and the findings were not significant across eight outcomes.

Program Delivery

Findings regarding implementation fidelity and program implementer were mixed. Four meta-analyses reported that the achieved level of implementation was a significant predictor for 9 out of 11 outcomes, yet this was not a significant moderator in three meta-analyses assessing six outcomes. In terms of who delivered the intervention, one meta-analysis found that teachers were more effective than researchers on six of nine outcomes, another found that researchers were more effective on the only outcome assessed, and yet another meta-analysis found that a combination group that included both teachers and researchers were more effective than either group working alone on one of three outcomes.

Program Components

There was also little consistency in which program components were examined as possible moderators and subsequent findings. Two of the three meta-analyses of preschool

interventions found that parent involvement in a multi-component program (i.e., school and home) was not a significant moderator on four outcomes, while one did report significance on two of three outcomes. Duration of the intervention was not significant in eight meta-analyses involving 26 outcomes, but significant in two other meta-analyses for two of four outcomes, indicating that programs less than one year in length were more effective than those lasting a year or more. Surprisingly, none of the meta-analyses examined which skills or combination of skills targeted in the program might moderate outcomes.

Social-Ecological Variables

Few social-ecological variables were examined in moderation analyses. The school's geographical location (i.e., urban, rural, or suburban) was not significant in the three meta-analyses that examined this variable across 9 outcomes. Two meta-analyses compared the outcomes for studies conducted in the United States and those occurring in other countries; one meta-analysis found that evaluations conducted within the United States were more effective than those conducted elsewhere on one of two outcomes, but the other meta-analyses did not find a significant moderating link involving four outcomes.

Methodological Issues

In addition to student age, methodological issues also received considerable attention. All 12 meta-analyses assessed some aspect of methodology, but there was no consistency regarding which specific aspects were examined or in the findings. For example, among five meta-analyses comparing the results for randomized and quasi-experimental studies, only one reported significance favoring quasi-experimental designs on one of three outcomes. Four meta-analyses examined overall experimental quality, but only one found significance favoring studies of lower quality. Nine meta-analyses assessed the possibility of publication bias, which was significant in

three reviews involving three of nine outcomes, but not significant in the other six meta-analyses involving 10 outcomes.

Finally, in terms of how skills were measured, seven reviews did not find any significance in terms of the source of the assessment (i.e., student, teacher, or parent), or in whether a performance measure (e.g., Iowa Test of Basic Skills) versus a student self-report was employed (across 15 outcomes). However, three other reviews either found that parents reported significantly higher skill levels in their children than other reporters, or that skills measured through a direct performance task yielded significantly higher effects than student self-report measures. There were 23 additional diverse variables assessed as potential moderators (e.g., differential attrition). The results of these analyses are contained in supplementary materials and are not discussed further because they each represent a unique finding and most of these analyses failed to reach significance.

Discussion

This review involved 12 meta-analyses initiated by 11 independent research groups evaluating the impact of universal, school-based interventions occurring over different temporal and developmental periods. The evidence, drawn from 524 unique reports of SEL programmatic interventions implemented worldwide, shows that such interventions are consistently associated with several positive student outcomes. These outcomes include improved personal and social skills, attitudes, positive social behavior, and academic performance, and reductions in problematic behavior, emotional distress, and drug use. Furthermore, positive follow-up effects were also observed; however, as expected, the magnitude of these improvements were less than what was observed at post-test. The results of our review support the overwhelming and growing evidence base that SEL programs are highly promotive of young people's positive, healthy

development over multiple domains, in diverse cultural contexts, and over the past several decades.

Placing the Practicality of SEL Program Impacts in Context

It is important to place the current findings in perspective compared to some other school-based programs and comment on their practical significance. Benchmarks are available for judging the relative gains achieved by many universal primary prevention programs (Tanner-Smith et al., 2018). For externalizing behaviors, a mean effect with a magnitude of 0.20 lies at the 50th percentile of the distribution of effects in terms of what has been reported in 11 meta-analyses of universal prevention programs for youth evaluating 385 studies. All four of the meta-analyses assessing conduct problems as an outcome reported effects that pass this 50th percentile mark and three of them equal or surpass mean effects lying at the 75th percentile of the distribution (i.e., 0.28; Boncu et al., 2017, Sklad et al., 2012, Wigglesworth et al., 2016). In other words, the findings for SEL programs compare very favorably to those obtained by universal prevention programs in terms of reducing levels of conduct problems.

Although Goldberg and colleagues (2018) reported that SEL interventions implemented as whole school approaches did not significantly improve academic performance, results from four other meta-analyses that examined academic performance suggest the reported outcomes at post (mean effects from 0.18 to 0.46) are significant. For example, in his analysis of 1,942 effect sizes drawn from nearly 750 randomized educational experiments, Kraft (2020) reported that the median effect for academic achievement was only 0.10. Based on his analysis of typical student academic performance, he stressed that mean effects of 0.20 or higher are of practical significance because they do represent meaningful academic gains, although they are not often achieved. In other words, SEL programs have been associated with a practical increase in

academic performance that surpasses many exclusively educational interventions. Unfortunately, only 76 studies reported academic outcomes in the 12 meta-analyses included here.

Another way to consider the practical benefits associated with SEL programs is to use Rosenthal and Rubin's (2003) binomial effect size display (BESD) which converts an effect size for an outcome to the percentage of intervention and control students who change positively. Applying the BESD can offer an estimate of how many more students would change on a particular type of outcome after participation in a SEL program compared to a school not offering such a program but continuing with their customary curricula and programming. For example, based on Durlak and colleagues (2011) mean effect of 0.22 for conduct problems, application of the BESD suggests that 11% more students receiving an SEL program changed positively on this outcome compared to control students. The calculations are explained in supplemental materials and can be applied to any outcome category. School administrators often indicate that disciplinary issues are of major concern. Therefore, it is reasonable to believe that many educators would consider 11% more of the student body improving in their conduct after participation in an SEL program to be a meaningful benefit.

Kraft (2020) has emphasized that judgments regarding the practical value of program effects should also be viewed in terms of program costs and scalability. An economic evaluation of six evidence-based SEL programs indicated a cost-to-benefit ratio of 11 to 1 suggesting eleven dollars in benefits accrue for each dollar spent, although these findings cannot be generalized to all other SEL programs (Belfield et al., 2015). In terms of scalability, SEL programs can require considerable time and effort to achieve their effective implementation, so it is an empirical question which specific SEL programs can be distributed, adopted, and successfully implemented at scale.

Variability in Findings of Moderators

Although school-based SEL programs have been consistently effective, meta-analyses have confirmed that variability in effects is the norm. Some programs achieve better results than others, but the reasons for this variability have yet to be explained. With few exceptions, there is little consistency in which variables have been examined, why some programs are associated with better results than others, or in the results when the same variables are tested across different meta-analyses. Although the effectiveness of universal, school-based SEL programs are unequivocal, research elucidating the conditions and mechanisms by which these programs are most effective is limited. However, one important finding in the reviewed moderator analyses was that the same moderator is unlikely to affect every outcome. Across all the reviews reporting significance for a particular moderator, significant results were obtained on only 40% of the tested outcomes (38 of 95). In other words, it is important to test for moderation across all collected outcomes to discover which are affected and which are not.

We believe there are at least three main reasons for the inconsistency found in the moderation analyses across meta-analyses. First, each meta-analytic research team used different inclusion and exclusion criteria to select studies for review and covered different temporal and developmental periods in their searches. As a result, different features of the original study samples and characteristics of the SEL programs that were evaluated could have affected the magnitude of outcomes reported across the 12 included meta-analyses and the inconsistent findings regarding significant moderators. Second, in many cases researchers did not offer a theoretical or empirical basis guiding their moderator analyses, and it is not possible for any one project to test every possible scenario. Therefore, a potentially relevant moderator variable might have been assessed in one review but not in another.

Third, meta-analyses are often restricted by limited information in the original studies regarding potentially important moderators. Several authors cautioned that their findings may have been affected by limited reporting in the primary studies regarding potential moderators, such as student race/ethnicity, gender, program implementation, social or environmental features or outcomes of interest such as targeted skills, or academic performance (Blewitt et al., 2018; Durlak et al., 2011; Goldberg et al., 2019; Moy et al., 2018; Taylor et al., 2017)

Future Research Agenda

Future research should be directed at acquiring answers to two important questions. First, what skills for what youth developed at what ages lead to what types of short- and long-term outcomes? Second, what are the most important individual, ecological, methodological, and programmatic variables that promote or hinder the development of different SEL skills for school-aged youth and influence short- and long-term adjustment? Answering these two questions will require many studies that address different parts of these two questions because no single study can examine all the possible factors that may play a role. Obtaining information regarding these two questions requires that future researchers improve upon the reporting and analyses of SEL programs in many ways. We discuss several issues of importance here.

Complete Reporting

The first improvement that must be made involves the complete reporting of the details of research studies that includes complete data on study context, participants in all conditions, intervention, and outcomes. There are now several resources and options that can be used to register trials before they are undertaken, post and store complete study and outcome details once the trials are completed and share this information with other researchers. Hennessey et al. (2022) provides an excellent overview of these developments including practical suggestions for

reporting of study details so this information can be easily used by those undertaking systematic reviews and meta-analyses. In addition, many academic journals now post supplementary materials available to readers so researchers can provide a thorough explanation of their samples and procedures, and journal editors and reviewers should insist on their inclusion. In line with how the moderators were examined in this review, the following sections focus on recommendations regarding the characteristics of participants, program delivery, program components, social-ecological factors, and methodological issues that need attention in future research.

Individual Characteristics

At first glance, it appears encouraging that some moderator analyses suggest student gender, race/ethnicity, or SES did not significantly moderate outcomes. However, only five meta-analyses examined the moderating role of students' race/ethnicity, three examined the role of SES, and three examined the role of gender (see supplemental materials for more information regarding which meta-analyses included these moderation analyses and accompanying results). Given the dearth of measurement and reporting on students' sociodemographic characteristics, we are unable to draw any conclusions concerning the impact of SEL interventions on students with the above characteristics.

Recent research exploring elementary, middle school, or high school universal school-based SEL studies have shown inconsistency in the reporting of student sociodemographic characteristics and most original studies have not tested for possible moderating effects (Cipriano et al., 2022; Daley & McCarthy, 2021; Rowe & Trickett, 2018). For example, Cipriano and colleagues (2022) found that only 7.4% of 269 universal SEL elementary school studies analyzed intervention outcomes by disability status and only 28.3% analyzed outcomes as a function of

students' race or ethnicity. Understanding how different student- and family-level characteristics may affect short- and long-term student adjustment outcomes is integral to understanding the impact of SEL programming. Researchers should not only collect and describe the many and rich characteristics of their samples thoroughly, but also conduct subgroup analyses on important participant characteristics to determine if and how SEL programming is inclusive, equitable, and beneficial for all learners. The current review is unfortunately limited in offering clarity about SEL interventions' influence on students based on their gender, race/ethnicity, SES, and other important characteristics due to how previous researchers conceptualized, collected, reported, and analyzed participant data. Going forward, it is important that SEL program evaluators not only ascertain, analyze, and disseminate relevant student-, family-, and school-level characteristics so the SEL field can better understand program impacts.

Program Delivery

Implementation. Documenting the quantitative and qualitative features of program implementation is important in assessing multiple aspects of implementation such as fidelity, quality of delivery, dosage, and participant responsiveness. SEL has become a worldwide initiative, but schools operate differently across diverse social and cultural settings. It is instructive to know exactly how adaptations of the general SEL model have been used with success in different school districts, states, and counties. For example, program adaptations are probably necessary for different racial, ethnic, or cultural groups in different settings, and to accommodate the needs and aims of school staff, but it is often not specified how this has been accomplished to suit each context (Arundell et al., 2021). Understanding how best to fit programs into each ecological niche would aid in efforts to develop programs applicable across multiple communities and for diverse student bodies without sacrificing efficacy.

Often teacher reports are the only method used to estimate implementation, but these data do not always coincide with independent assessments achieved through video-based or live observations (Durlak & Dupre, 2008). Moreover, a global overall estimate of program implementation is likely to mask differences in levels of implementation achieved by different providers because we cannot expect every implementer to be equally adept at delivering the program. Therefore, it is often useful to assess how various levels of implementation delivered across classrooms or schools might affect student outcomes (e.g., Battistich et al., 2000).

Training. Outcome studies seldom discuss in any detail the quality or effectiveness of the training that school staff receive prior to program onset or any continuing consultation available once the program begins (e.g., Schonert-Reichl, 2017). These elements often remain in the background but are important for effective implementation and eventual program success. Therefore, we need information on the most efficient and effective ways to develop the competencies that school staff need to conduct SEL programs well. There is a growing literature on this topic (e.g., Oliveira et al., 2021) but the comparative effectiveness of alternative training and consultation tactics is seldom examined.

Program Components

Skills and competencies. The central feature of all SEL programs concerns the promotion of intrapersonal and interpersonal skills so it is essential that these elements of the intervention be carefully described and evaluated. We have already noted how this information has been limited in prior studies. No meta-analysis to date has examined which targeted skills or their combination might influence various outcomes, but it is precisely this type of information that requires clarification. Therefore, it is essential that future studies measure each targeted skill level carefully at the beginning and through the end of the intervention. Assessment before the

program begins, and progress monitoring during implementation, permits exploration of how much change in skill levels are possible through different programs for different students and how initial and changing skill levels might be related to later outcomes. This latter information is important because it would allow schools to choose or adapt approaches based on their students' needs. Many frameworks have been established to identify and categorize different types of SEL skills (Berg et al., 2017). Future evaluation reports should contain a detailed logic model, making it clear why and how an intervention is expected to be effective. Furthermore, each logic model should be carefully tested to assess its validity. Mediation analyses are necessary to confirm the theoretical basis of SEL programs (i.e., whether improvement of skills over time influence the outcomes achieved). Unfortunately, such analyses are rare in SEL outcome research.

Components and features. Dismantling multi-component programs should be conducted to ascertain the relative contributions of different components. This would help to answer questions about the importance of different program features. For example, what are the most effective teaching methods to promote different skills? How exactly is the program extended beyond traditional curriculum sessions to encompass possible “teaching moments” throughout the school day? If parents or community members become part of so-called multicomponent interventions, what exactly do these supportive personnel do, how much of the intervention is extended through these individuals, and how well do these individuals monitor or support student skill practice and mastery? Furthermore, what training do non-school personnel receive and how is this training evaluated?

Similarly, while whole school interventions have become popular, no standardized approach has been developed and evidence of their effectiveness is mixed (e.g., Wigelsworth et al., 2021). Guidelines are available for conducting a systemic whole school SEL approaches

(e.g., CASEL 2021a; Mahoney et al., 2021; Meyers et al., 2019), but different methods and models have appeared in the literature. The different elements of these complicated interventions require careful specification, and the implementation and relative contribution of each component should be assessed.

Program comparison. The literature is clear that many SEL programs are effective in control group designs. The time has come to compare the effectiveness of different SEL programs to help educators choose which program to adopt. Because so many programs can be effective, it can be extremely useful to know which alternative intervention may be more effective in a particular context and for which students.

Social-Ecological Factors

Specifying and measuring which contextual or ecological factors are most important and how they may interact has probably received the least attention to date in SEL research. Many important issues at the school-level are fertile ground for investigation including the organization, structure, and functioning of the school, financial and personnel resources, readiness to change, history at school improvement, relationships and connections with families and the local and larger community, how decisions are made, how well staff collaborate and support each other, and leadership (e.g., CASEL, 2021b; Greenberg et al., 2016; Jennings & Greenberg, 2009). Effectively integrating new interventions into schools so they will be successful and sustainable requires systemic change, but more examples of successful efforts are needed. Viewing interventions from a systemic framework emphasizes the synergistic roles of classroom, school, family, community, district, nation, and even international influences. Therefore, a true bioecological analysis would explore the nested and interacting role of moderators across levels or organizations (Mahoney et al., 2021).

Methodology

Quality and bias. Different methodological features have received considerable attention among the moderation analyses that have been conducted to date, and some of these variables have been identified as significant moderators in multiple reviews. Unfortunately, there is no standardized procedure for deciding which methodological features should be examined or how the experimental rigor or overall quality of a particular study should be examined. The risk of bias approach developed by the Cochrane Collaboration (Higgins et al., 2011) has become a popular technique, but researchers should not stop short of simply assessing the levels of possible risks of bias (i.e., low, medium, or high). The field would benefit from understanding which biases affect different outcomes to qualify and interpret current findings appropriately and provide guidance on how to eliminate such biases in future research.

Assessment. There are two important ways that assessment can be enhanced in future work. First, three reviews found the source of skill assessment mattered (e.g., performance measure versus self- or other reports of skill development) so these alternative measurement strategies should be pursued. There have been substantial developments in the past decade on the measurement of different SEL skills. Resources are available to offer choices about skills in multiple domains for students of different ages, although the feasibility, ease of administration, and interpretation associated with measures should be considered (Müller et al., 2020). It is now possible to assess some skills online (Assessment Work Group, 2019) and schools that have the technological capabilities can avail themselves of these materials. However, proper training in assessment administration and interpretation is critical for reliable and valid measurement and appropriate decision making. Moreover, as with all skills assessments it is important to consider issues of bias and assess their applicability and appropriateness across different settings and

cultures. To date, little work has been done on the cultural appropriateness of assessments of student skills.

Second, more thorough, and careful assessment of potential moderators are needed. Several researchers have tested the influence of multiple moderators individually, but meta-regression is now the preferred analytic technique for examining the relative influence of multiple moderators (Piggott & Polanin, 2020). Furthermore, the typical analytic strategies social scientists employ treat each moderator as a separate, linear variable. However, moderation can involve a complex, interactive process of individual, programmatic, and contextual factors operating together over time in non-linear ways. When statistical power allows, evaluating hypothesized interactive patterns of nested moderators is needed. For example, some included meta-analyses found that shorter program duration predicted better outcomes than did programs with a longer duration which suggests that shorter is better. However, this may reflect an interaction between the nature of the skills targeted for intervention, student needs, or other factors. Accordingly, more follow-up assessments are needed to determine the longer-term benefits of programs that vary in duration.

Additional Issues

Other researchers have offered useful recommendations to advance SEL research that augment those presented here. More specifically, there is a need to fortify family and school collaborations and study the influence that parents and the home environment have on students' SEL development (Osher et al., 2016). Likewise, efforts to align school and out-of-school SEL programming have increased through collaboration between in-school and out-of-school initiatives (e.g., Mahoney & Weissberg, 2018). Jennings and Greenberg (2009) have emphasized that strengthening administrators' and teachers' social and emotional development can foster

more supportive learning environments and promote students' development. Jones et al. (2019) emphasized the connection between neuroscience research and SEL, as all learning affects (and is affected by) brain development, which in turn is influenced by past and present experiences. They have also noted that if SEL programming is to become a sustainable part of education, then it is essential that researchers collaborate closely with providers to ensure that proposed programmatic offerings are attentive to the multiple demands of educational practice.

The 12 meta-analyses reviewed here have only focused on the impact of SEL programs on changes at the individual level of analysis, which, of course, are important and have led to multiple positive benefits for students. However, the full potential of SEL may be realized by preparing individuals who can positively and productively contribute to collective community well-being by being instrumental in making needed systemic and organizational changes. For example, Jagers et al. (2019) emphasized that researchers and practitioners should consider the concept of transformative SEL in the effort to achieve educational equity and excellence for all students. Transformative SEL is guided by the principles of human rights and social justice, and encourages engaged and critical citizenship, that is, behaviors involving individual and collective action directed at the common good. They urge researchers to assess the development of competencies related to culture, identity, agency, belonging, and engagement, which may be particularly important for members of historically marginalized groups. Interventions involving cultural education, project-based learning, civic education, and youth participatory research deserve consideration because of their potential impact on cultivating skills that can be important in enacting positive social change and reducing social inequities.

Implications for Policy and Practice

The extensive positive research evidence on SEL programs should encourage relevant educational policies and practice. For example, schools of education should teach their students how SEL approaches have been used successfully at different curricula levels and train their student teachers in pedagogical strategies that promote SEL skills. Educational policies should encourage preschool through high schools to adopt and evaluate evidence-based universal SEL programs that can be integrated into routine pedagogical practice. Administrators at all levels (i.e., local, state/provincial and national) should establish systems that provide the necessary support and incentives for school districts to learn about the potential value of SEL. Administrators should also create relevant professional development and offer continuing support so school staff can become proficient in implementing SEL interventions, and collaborations should be established between researchers, practitioners, and community members on how to assess the impact of locally-adopted programs with the intent of continual program improvement.

Limitations

Our review of evidence for SEL programs was restricted to information available in previously published meta-analyses, which, in turn, are limited by the amount and type of data available in primary studies. Moreover, we did not review community-based SEL programs (Ciocanel, 2017) and only examined outcomes for students enrolled in preschool through high school settings. We also did not evaluate programs to improve social and emotional competencies of teachers and other school staff, which may serve as an important moderator of student outcomes. There is growing evidence that SEL interventions can improve school and classroom climate (Charlton et al., 2021), as well as the social-emotional competence and

psychological distress of teachers (Oliveira, 2021). Carefully done systematic reviews and qualitative studies are other sources of potentially useful information that can increase our understanding of SEL impact and moderation (e.g., Grant et al., 2017; Jones et al., 2021).

Individual studies that address gaps in the current literature can also serve as good models for the field. Also, new research areas have developed that merit consideration for how to increase the efficiency and reach of programming. One rapidly developing area involves technology; studies are beginning to document the positive impact that online programs, use of smartphones, video conferencing, or digital games can have on student SEL skills, teacher training and professional development, or program evaluation (Lee et al., 2020; Santo et al., 2019). The COVID pandemic created a crash course introduction to on-line education for many educators and school districts, and future efforts should concentrate on assisting schools and teachers to use different technologies to implement SEL effectively and equitably. Equity for all students is an important concern in this newer research area as socioeconomic issues often limit the use and reach of technology across schools and homes.

Conclusion

There is extensive and consistent data on the multiple benefits connected with universal, school-based SEL programs, and it is important to understand the conditions and mechanisms by which these programs are most effective. Researchers, policy makers, and practitioners should collaborate in working toward an understanding of what works best for whom, when, why, and under what conditions. This will aid in the future development of more efficient and effective interventions to serve the diverse needs of all young people.

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Table 1*Characteristics of the included 12 meta-analyses of SEL program impacts*

Authors	Timing of Outcome Assessment	Ages/ Grades	# Studies/ Interventions	# Effect Sizes Tested	# Students (N)	Time Period	% RCT	# (%) Studies Outside the U.S. or North America ¹	Study Quality Score
Blewitt et al., 2018	Post	Ages 2-6	63	391	18,292	1995-2017	nr	28 (49%)	30
Boncu et al., 2017	Post	Ages 3-18	37	nr	32,742	2008-2015	nr	nr	19
Durlak et al., 2011	Post and Follow-up 6+ months	Grades K-12	213	nr	270,034	1955-2007	47	27 (13%)	30
Goldberg et al., 2018	Post	Ages 4-16	45	nr	496,299	1999-2017	62	25 (56%)	28
January et al., 2011	Post	Grades PreK-12	28	31	12,965	1981-2007	nr	nr	19
Luo et al., 2020	Post	Ages 3-5	39	37	10,646	2015-2018	54	11 (28%)	28
Moy et al., 2018	Post	Grades PreK-8	27	144	18,847	1984-2016	nr	4 (15%)	30

Sklad et al., 2012	Post and Follow-up 7+ months	Primary & Secondary School	75	nr	Avg. <i>N</i> = 543 per study	1995- 2008	56	16 (21%)	29
Taylor et al., 2017	Follow-up 6+ months	Grades K-12	82	nr	97,406	1981- 2014	63	38 (46%)	29
van de Sande et al., 2019	Post ²	Ages 11-19	40	nr	24,328	2014- 2018	59	19 (59%) ³	25
Wigelsworth et al., 2016	Mix of Post and Follow-up 6+ months ⁴	Ages 4-18	89	nr	nr	1995- 2013	64	nr ⁵	29
Yang et al., 2018	Post	Ages 3-5	29	nr	16,672	1980- 2018	69	2 (07%)	30

Notes. nr = not reported. RCT = randomized control trial.

¹ Supplemental materials specify the reported geographic areas and countries involved in each meta-analysis.

² van de Sande et al. (2019) reported 12 studies included follow-up information of 3-24 months, but only post-intervention results are included in the effect sizes for outcomes.

³ van de Sande et al. (2019) reported geographic information for 32 programs, involving 40 studies. 19 programs were implemented outside the U.S., including 1 program implemented in both the U.S. and Europe.

⁴ Wigelsworth et al. (2016) included 29% (26/89) follow-up studies, but main effects analyses did not differentiate post vs. follow-up effects.

⁵ Wigelsworth et al. (2016) compared studies implemented within the country of development (i.e., home) with those implemented outside the country of origin (i.e., away). The majority of studies were “home” programs (80%), mostly originating from the USA, but the actual percentage of studies conducted outside the U.S. or North American is not reported.

Table 2*Meta-analyses assessing post-intervention, main effects of SEL programs*

Authors		Overall	SEL skills	Attitudes	Attention/Self-Regulation	Positive/Prosocial Behavior	Conduct problems	Emotional Distress	Behavior & Emotion Difficulties	Emotional Competence Only	Academic Performance	Drug Use
Blewitt et al., 2018 ¹	ES CI Ns	.38* .24-.58 79	.28* .11 -.46 16	--	--	.30* .18-.42 61	--	--	.19* .11-.28 58	.54* .22 -.86 41	.18* .02-.33 16	--
Boncu et al., 2017	ES CI Ns	.31* .17-.44 37	.36* .25-.47 23	.19* .04-.33 7	--	.20* .06-.34 10	.37* .18-.57 22	.17* ² .07-.28 18	--	--	--	--
Durlak et al., 2011	ES CI Ns	.30* .26-.33 213	.57* .48-.67 68	.23* .16-.30 106	--	.24* .16-.32 86	.22* .16-.29 112	.24* .14-.35 49	--	--	.27* .15-.39 35	--
January et al., 2011	ES CI Ns	--	.15* ³ .12-.19 28	--	--	--	--	--	--	--	--	--
Luo et al., 2020 ⁴	ES CI Ns	--	.42* .28-.56 34	--	--	--	--	--	.31* .19-.43 28	.33* .10-.56 14	--	--
Sklad et al., 2012	ES CI Ns	-- -- 55	.70* .51-.89 31	.46* .22-.69 8	--	.39* .15-.63 6	.43* .32-.54 39	.19* .09-.29 13	--	--	.46* .31-.61 10	.09 .06-.13 10

Wigelsworth et al., 2016	ES	--	.53*	.17		.33*	.28*	.19*		.27*	.28*	
	CI	--	.32-.75	.07-.28	--	.24-.42	.20-.36	.13-.25	--	.14-.39	.18-.40	--
	Ns	89	24	9		39	40	32		14	15	
Yang et al., 2018 ⁵	ES	--	.03-.20*	.93*	.00-.46*	.11*	.07-.45*	.42*	.27*	.23*		
	CI	--		.79-1.08		.04-.20		.30-.54	.19-.36	.17-.29	--	--
	Ns	29	8-16	4	3-5	24	3-21	4	5	5		

Notes. * $p < .05$. ES = effect size. CI = confidence interval. Ns = # of studies. -- = not reported.

¹ For Blewitt et al. (2018), based on the authors' operational definitions, outcomes were categorized as follows: social competence = prosocial behavior, self-regulation = SEL skills; early learning = academic performance.

² Boncu et al. (2017) shows internalizing problems to be significant in Table 1, but the discussion reports the result as nonsignificant. Because the CI indicates significance, it is reported as such.

³ January et al. (2011) indicated 28 articles were included the meta-analysis, but the overall effect appears to involve the 20 articles reported in Table 1 of the article.

⁴ Luo et al. (2020) categorized social competence and emotional competence separately, but operational definitions were not provided. Social competence included outcomes such as social competence, cooperation, social skills, prosocial behavior, social problem solving and was therefore categorized as SEL skills. Emotional competence included outcomes such as emotional competence, emotional regulation, emotional concepts, and affective knowledge and was therefore categorized as Emotional Competence Only.

⁵ Yang et al. (2018) divided outcomes into overall positive (ES = .18, CI = .07-.21) and overall negative categories (ES = .10, CI = .03-.18), and both were significant. Based on the authors' operational definitions of the constructs within these two categories, outcomes were

categorized as follows: positive and negative coping behavior, and cooperation = SEL skills; social skills = prosocial behavior, and emotional understanding and expression = emotional competence; positive feelings = attitudes; negative feelings = emotional distress; aggression and behavior problems = conduct problems; social problems = behavioral and emotional difficulties. Because more than one outcome could belong to a category, a range of effect sizes for some outcome categories is presented without CIs.

Table 3*Meta-analyses assessing follow-up, main effects of SEL programs*

Authors			Overall	SEL skills	Attitudes	Attention/Self- Regulation	Positive/ Prosocial Behavior	Conduct problems	Emotional Distress	Emotional Competence & Emotion Difficulties	Academic Performance	Drug Use
Durlak et al., 2011	ES	--	--	.26*	.11*		.17*	.14*	.15*		.32*	--
	CI	--	--	--	--	--	--	--	--	--	--	--
	Ns	33	8	16			12	21	11		8	
Sklad et al., 2012	ES	--	--	.07*	.07*		.12*	.20*	.10*		.26*	18*
	CI	--	--	.04-.09	-.03-.10	--	.06-.18	.10-.30	.04-.17	--	.16-.36	.11-.25
	Ns	33	15	12			7	16	11		7	24
Taylor et al., 2017	ES	--	--	.23*	.13*		.13*	.14*	.16*		.33*	.16*
	CI	--	--	.15-.31	.05-.21	--	.05-.21	.07-.21	.08-.23	--	.17-.49	.09-.24
	Ns	82	29	26			28	34	.35		8	28

Notes. * $p < .05$. ES = effect size. CI = confidence interval. Ns = # of studies. -- = not reported.

Table 4

Meta-analyses assessing post-intervention, main effects of SEL programs focused on specific research questions

Authors		Overall	SEL skills	Attitudes	Attention/Self-Regulation	Positive Prosocial Behavior	Conduct problems	Emotional Distress	Behavior & Emotion Difficulties	Emotional Competence Only	Academic Performance	Drug Use	Program Knowledge
Moy et al., 2018	ES CI Ns	-- -- 27	--	--	--	.19* .08-.31 14	.22 -.03-.47 13	--	--	--	--	--	1.08* .55-1.60 13
Goldberg et al., 2018 ¹	ES CI Ns	-- -- 45	.22* .08-.35 27	--	--	--	--	.10* .04-.18 10	.13* .08-.19 39	--	.19 -.10-.49 8	--	--
van de Sande et al., 2019 ²	ES CI Ns	-- -- 40	.24*-.58* 5-17	--	--	--	.32* .23-.42 11	.26*-.31* 8-19	--	--	--	.39* .14-.63 6	--

Notes. * $p < .05$. ES = effect size. CI = confidence interval. Ns = # of studies. -- = not reported.

¹ Goldberg et al. (2018) defined social and emotional adjustment to include both social or emotional skills, and attitudes toward self and others.

They defined behavior adjustment to include positive social behavior, conduct problems, victimization, and risky behavior (e.g., substance abuse, unprotected sexual intercourse).

² van de Sande et al. (2019) reported on 5 domains of social and emotional competence (i.e., self-awareness, self-management, social awareness, relationship skills, and decision making) and each was significant. The largest effects were found for self-awareness (ES = .42, CI = .24-.60) and social awareness (ES = .58, CI = .35-.81), the smallest effect was found for relationship skills (ES = .24, CI = .19-.30). They reported effect sizes for depression (ES = .31, CI = .21-.42) and anxiety (ES = .27, CI = .19-.35) separately, and both were significant. Because more than one outcome could belong to a category, a range of effect sizes for some outcome categories is presented without CIs.

Table 5*Number of meta-analyses assessing potential moderators of outcomes and their findings*

Moderating Variable	# of Reviews Testing the Moderator	# of Reviews Reporting Significant Moderation	Proportion of Outcomes Tested with Significant Moderation	Explanation of Significant Findings	# of Reviews Reporting Moderator <u>was not</u> Significant	Total # of Outcomes Tested that Lack Significant Moderation
<u>Individual Characteristics</u>						
Ages/Grades	10	4	.42 (5 of 12)	Favors younger students	6	12
Gender	3	none			3	8
Race/Ethnicity	4	none			4	13
SES	3	none			3	7
<u>Program Features</u>						
Implementation Quality	6	3	.72 (8 of 11)	Favors higher quality	3	4
Duration	9	4	.50 (5 of 10)	Favors shorter programs	5	12
Implementer	4	3	.50 (6 of 12)	Inconsistent ¹	1	3
Length of Follow-up	2	none			2	2

Program Components

Multicomponent	5	2	.75 (3 of 4)	Favors parent or community participation	3	12
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Social-Ecological Factors

Geographic Area	3	None			3	10
Host Country	5	1	.50 (1 of 2)	Favors U. S. studies	4	11

Methodological Issues

Experimental Design	6	1	.33 (1 of 3)	Favors quasi-experimental designs	5	14
Quality of Design	4	2	.33 (2 of 6)	Favors studies of lower quality	2	3
Sample Size	2	none			2	5
Publication Bias	9	2	.33 (3 of 10)	Favors unpublished studies	7	21
Outcome Reliability	3	none			3	9
Outcome Validity	3	none			3	9

Source of Outcome	6	3	.27 (3 of 11)	Inconsistent ²	3	6
Date of Publication	2	none			2	6
Type of Skill Assessment	2	1	.25 (1 of 4)	Favored structured task over parent, teacher, or observer reports	1	2

Note. Only those moderators tested in two or more reviews are shown. Supplemental material provides a complete list of moderators and the findings for each review.

¹ In one meta-analysis, moderation favored teachers over non-school personnel, but in two others it favored non-school personnel or a team approach over classroom teachers.

² In one meta-analysis, moderation favored teacher reports or observer ratings over parent reports; a second favored all other sources (parents, teacher, or observers) over child self-report, and a third meta-analysis found that studies using multiple sources (e.g., self-reports and other reports) reported lower effects than those utilizing a single-source outcome measure.

Figure 1

PRISMA flow diagram of search and identification of articles for inclusion

