



# The role of after-school programs in supporting social and emotional learning: A synthesis of systematic reviews

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## ABSTRACT

After-school programs (ASPs) offer inclusive, developmentally rich environments that can help close developmental gaps and promote equitable learning opportunities for all children. Given increasing participation in ASPs and the critical role of social and emotional learning (SEL) in long-term outcomes, a comprehensive synthesis of their effectiveness in promoting SEL is warranted. This umbrella review examined systematic reviews and meta-analyses on the impact of ASPs on SEL among children aged 4–12, focusing on program characteristics, contexts, and target populations.

A systematic search across four databases (Web of Science, PsycINFO, ERIC, and Scopus) in December 2024 yielded ten eligible reviews. Studies included in these reviews assessed structured programs delivered outside regular school hours and curriculum. The reviews covered both general ASPs (e.g., academic and recreational programs) and content-specific extracurricular activities (e.g., STEM, music).

Seven reviews on general ASPs reported small but positive effects on SEL domains such as self-perception, prosocial behavior, and identity development. Program quality, design (e.g., experiential learning), duration, delivery context, and implementation fidelity emerged as key moderators of effectiveness. However, methodological limitations and inconsistent reporting constrained conclusions. Three reviews of content-specific activities reported consistent SEL benefits—particularly in identity formation, social skills, and perseverance—when programs featured hands-on learning, strong peer and adult-child relationships, and culturally responsive content.

Findings suggest ASPs can meaningfully promote SEL with differentiated program design and implementation strategies that reflect children's backgrounds, interests, and needs. Future research should prioritize interest-driven approaches, comprehensive program, and rigorous evaluation methods to identify best practices across diverse contexts.

## 1. Introduction

After-school organized activities—whether offered in school, child-care, or leisure settings—constitute an important developmental context that bridges the structured school day and the home environment, providing children with meaningful opportunities for learning and broad development. Within these settings, children participate in a range of activities that support both cognitive and social-emotional development (Durlak, Weissberg & Pachan, 2010; Lauer et al., 2006). After-school organized activities are particularly valued for their potential to reduce educational disparities and foster positive behavioral outcomes, especially among children from socioeconomically

disadvantaged backgrounds (Vandell, Simpkins & Liu, 2021).

Globally, participation in after-school organized activities has increased among primary school children (Afterschool Alliance, 2023; Larson et al., 2004). In this article, we will use the commonly used term after-school program (ASP) to refer to organized activities which are not part of the traditional school curriculum, are offered outside of school hours, are provided on a structural basis and intended to serve the dual purpose of care and education in a broad sense. To address the varied terminology used in the literature, ASPs are also referred to as out-of-school time (OST), informal learning, extended-day, enrichment, or extracurricular programs. These programs vary widely in structure and purpose: some primarily provide supervised free time, others

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combine academic remediation with recreational activities, and some are designed to concentrate on a particular subject area, such as sports or STEM. Increasingly, ASPs are recognized as spaces where children can build social capital, explore personal interests, and develop individual identities (Philp & Gill, 2020).

### 1.1. Broad developmental opportunities

Policy debates and academic discussions often emphasize cognitive achievement gaps, which are thought to be increasingly amplified by the rise of extracurricular shadow education (Zhang & Bray, 2020). Less attention has been paid to disparities in broader developmental opportunities. Extracurricular activities such as sports, music, and arts not only develop specific talents but also foster essential social-emotional competencies such as cooperation, resilience, and creativity (Boelens et al., 2021; Fredricks & Eccles, 2006; Lewis, 2004). However, access to enriching developmental opportunities is strongly dependent on family socioeconomic status. Children from higher-income and more highly educated families are significantly more likely to engage in extracurricular and enrichment activities - such as music lessons, sports, and academic clubs - than their peers from less advantaged backgrounds (Bering & Schulz, 2024; Dearing et al., 2009; Elffers & Jansen, 2019; Snellman, Silva, Frederick & Putnam, 2015). Structural barriers - financial constraints, lack of information, and limited local access - restrict extracurricular participation among children from low-income families, unless supported by public funds (Bennett, Lutz & Jayaram, 2012; Dearing et al., 2009). These disparities are not limited to secondary education but begin in early childhood and extend throughout the school years, reflecting broader patterns of social stratification.

Not only the frequency but also the type and combination of different types of extracurricular involvement contribute to unequal developmental outcomes. Studies show that participation in multiple domains - such as combining sports with music - offers cumulative developmental advantages, which are disproportionately accessed by upper-middle-class children (Bering & Schulz, 2024; Meier, Hartmann & Larson, 2018). Meanwhile, children from less privileged backgrounds may benefit substantially even from single forms of participation (Dumais, 2006; Southgate & Roscigno, 2009), yet these opportunities remain limited. These patterns contribute to what may be termed a "broad developmental gap": a widening inequality not only in academic performance but also in the cultivation of interests, talents, and social-emotional competencies - areas that are foundational to long-term educational engagement, job careers, income, health and well-being. ASPs can offer developmentally rich environments and, when accessible and affordable for all children, are uniquely positioned to help close opportunity gaps. They provide space for meaningful learning, the development of personal interests, and support for children to reach their full potential.

### 1.2. Social-Emotional learning in after-school programs

Recent developments in research and policy on after-school programs (ASPs) signal a shift from deficit-based models toward approaches that prioritize the promotion of positive social-emotional development and preventative support. Various conceptual models—such as Social Competence, Positive Youth Development, Positive Psychology, and Social and Emotional Learning (SEL)—have been introduced to enhance children's social-emotional wellbeing. These frameworks are grounded in shared core components, including self-regulation, a positive self-concept, interpersonal engagement, and ethical or social responsibility (Tolan, Ross, Arkin, Godine & Clark, 2016). Among these, SEL has emerged as the most widely adopted framework in both educational and after-school settings. The Collaborative for Academic, Social, and Emotional Learning (CASEL, 2005) identifies five core competencies: self-awareness, self-management, social awareness, relationship skills, and responsible decision-making. More recent perspectives have

expanded SEL to include social justice and equity goals, emphasizing the empowerment of marginalized groups and the creation of inclusive learning environments (Niemi, 2020).

Though many ASPs align with academic priorities, also to satisfy policy and funding demands, there is growing recognition of their broader developmental value, particularly in promoting SEL and psychosocial well-being (Christensen, Kremer, Poon & Rhodes, 2023; Cioanel, Power, Eriksen & Gillings, 2017). SEL complements academic learning by supporting children's overall development, including their ability to manage emotions, build relationships, and make responsible decisions. Research shows that SEL is not only associated with improved behavioral and mental health outcomes and stronger social functioning, but also with enhanced academic performance (Collaborative for Academic, Social, and Emotional Learning [CASEL], 2005; Domitrovich et al., 2017; Durlak et al., 2010; Mahoney, Harris & Eccles, 2006). Research also indicates that universal school-based SEL programs lead to long-term benefits in terms of positive behavior, mental health and academic success (Mahoney, Durlak & Weissberg, 2018).

ASPs complement formal schooling by addressing developmental domains - such as SEL - that are not always prioritized in academic curricula. While primary schools typically adopt a structured and academically oriented approach, ASPs provide more flexible environments that promote autonomy, play, peer interaction, and interest-driven learning (Mahoney, Larson & Eccles, 2005; Durlak et al., 2010). The less structured, interest-driven nature of ASPs provides opportunities to develop "soft skills" not always addressed during the school day, filling a crucial developmental gap for youth (Neild, Wilson & McClanahan, 2019). The flexible structure of ASPs makes them particularly well-suited to support SEL, especially through high-quality peer and adult-child interactions (Smith, Akiva, McGovern & Peck, 2014). Compared to schools, ASPs may be better positioned to overcome common implementation challenges, such as limited teacher training, policy misalignment, and competing academic demands (Domitrovich et al., 2017; Elias et al., 2015; Minney, Garcia, Altobelli, Perez-Brena & Blunk, 2019; Patti, Senge, Madrazo & Stern, 2015). Because they are less constrained by academic mandates, ASPs have greater autonomy to prioritize SEL, allowing for the development of unified SEL visions and the integration of corresponding staff training across the program (Domitrovich et al., 2017; 2015; Minney et al., 2019). Nevertheless, ASPs also face barriers to effectiveness, including issues related to program implementation, staff capacity, and accessibility (Pelcher & Rajan, 2016).

### 1.3. Prior research on after-school programs

Prior research shows that the overall effectiveness of after-school programs (ASPs) is determined by various moderating factors related to child characteristics, program characteristics, implementation quality, and methodological variables. Sociodemographic variables—like age, gender, socioeconomic status, and ethnicity—moderate outcomes, with evidence suggesting that younger children and youth from lower-income or minority backgrounds may benefit more in terms of self-esteem, identity development, and academic achievement (Durlak & Weissberg, 2007; Pedersen & Seidman, 2005; Vandell et al., 2021; Vandell, Reisner & Pierce, 2007). Program characteristics, including duration, focus, structure, and geographic location, also play a key role in effectiveness. Structured programs with engaging content, particularly in urban or underserved areas, may yield better results, though evidence remains mixed (Scott-Little, Hamann & Jurs, 2002; Shernoff & Vandell, 2007). Implementation fidelity and staff training are also crucial, as well-trained staff enhance youth outcomes and ensure consistent delivery (Smith, Daunic & Taylor, 2007; Yohalem & Wilson-Ahlstrom, 2010). Finally, methodological factors—such as research design, type of outcome measured, and publication bias—can influence reported effect sizes, with randomized controlled trials generally yielding smaller effects than quasi-experimental designs

(Cheung & Slavin, 2016; Pigott, Valentine, Polanin, Williams & Canada, 2013). Addressing these variables is essential for understanding how ASPs support children's social and emotional learning.

Several meta-analyses have evaluated ASP impacts (for instance Lauer et al., 2006; Lester, Chow & Melton, 2020; Taheri & Welsh, 2016; Zief, Lauver & Maynard, 2006), yielding mixed results. These studies primarily addressed academic achievement, school-related behaviors (e.g., attendance, bonding), and externalizing outcomes (e.g., substance use, problem behavior). Importantly, only few reviews have specifically examined SEL outcomes.

#### 1.4. Aim and scope of the current review

Although the field of after-school programs (ASPs) has been widely studied, an integrative synthesis specifically focused on their contribution to social and emotional learning (SEL) is currently lacking. Given the growing developmental needs of children and increasing participation in after-school activities, there is a clear demand for a comprehensive overview of the effectiveness of ASPs in supporting SEL. This focus is warranted, as SEL is strongly linked to children's academic success, well-being, and long-term outcomes in education, employment, and mental health.

A broad conceptualization of ASPs is essential to capture the diverse types of organized activities that can promote equitable developmental opportunities for children. The current review, therefore, adopts an comprehensive approach, by including a wide range of after-school initiatives. These concern not only general ASPs, but also summer programs, extracurricular activities, extended learning time programs, informal learning environments, and positive youth development interventions. Collectively, these diverse and sometimes overlapping learning contexts form an expansive after-school ecosystem that potentially offers critical opportunities for advancing educational equity and broad child development.

A key question is not just whether after-school programs (ASPs) are effective, but what works, for whom, and under which conditions. Answering this requires insight into both the mechanisms of impact and the populations most likely to benefit. Such questions cannot be addressed by individual studies alone, but demand a broad evidence base, including systematic reviews and meta-analyses across global contexts. The current umbrella review synthesizes the existing systematic review literature on the effectiveness of ASPs in promoting children's social and emotional learning (SEL), with a focus on program characteristics, delivery contexts, and target populations.

The central research question guiding this review is:

How can after-school programs contribute to children's social and emotional learning?

This overarching question is addressed through two sub-questions:

1. What is known from systematic reviews about social and emotional learning outcomes among children (aged 4–12 years) participating in after-school programs?
2. What are the mediating and moderating factors that influence the contribution of after-school programs to children's social and emotional learning?

By addressing these questions, this review seeks to clarify the role of ASPs in supporting equitable and effective SEL, thereby contributing to a more nuanced understanding of what works, for whom, and under what conditions.

## 2. Method

### 2.1. Eligibility criteria

#### 2.1.1. After-School programs

After-school programs (ASPs) were defined as structured, adult-supervised initiatives that operate regularly throughout the school year outside standard school hours. These programs may offer a variety of enrichment activities, such as academic support, recreation, and group-based projects. For the purposes of this umbrella review, it was not required that the term ASP be explicitly used. The review aimed to include a broad range of initiatives—such as after-school programs (including summer programs), extracurricular activities, extended learning time initiatives, informal learning opportunities, and positive youth development programs—provided they met the criterion of taking place outside regular school hours under adult supervision. Reviews of research on programs embedded within regular school curricula were excluded. Similarly, reviews that focused exclusively on individual activities, such as private music lessons, were not included. Given the focus on social-emotional learning (SEL), only reviews of studies examining group-based ASPs or those involving a combination of group and individual activities were considered eligible. All included reviews focused on organized activities delivered in after-school or community-based settings (e.g., clubs, community centers), in line with the operational definition of ASPs used in this review.

#### 2.1.2. Social and emotional learning

The present umbrella review adopted the CASEL model, which outlines five core social and emotional learning (SEL) competencies: self-awareness, self-management, social awareness, relationship skills, and responsible decision-making (Elias et al., 2020; Ross & Tolan, 2018). Included reviews were not required to explicitly use the term 'SEL' but had to examine at least one outcome measure that aligned with or overlapped with the CASEL framework. Eligible outcomes included social and emotional development, social functioning, self-perception, prosocial behavior, feelings and attitudes, behavioral adjustment, and character education. Following approaches that prioritize preventative support and the promotion of positive social and emotional development, as described by Tolan and colleagues (2016), reviews focusing solely on the prevention of negative behaviors (e.g., substance abuse, behavioral problems) were excluded. Also, reviews focusing solely on health-related outcomes (e.g., weight management, healthy eating behavior, or physical activity levels) were excluded.

#### 2.1.3. Children

The population of interest consisted of children aged 4–12 years, in elementary or middle school. Studies focusing exclusively on preschool-aged children (2–5 years) or high school students (14–18 years) were excluded. Reviews that included studies on both middle and high school children were eligible. Reviews focusing exclusively on clinical populations or specific conditions (e.g., ADHD, physical disabilities, autism) were excluded, because of our focus on general child populations. However, studies targeting children based on socioeconomic risk factors (e.g., "at-risk children in low-income neighborhoods") were considered eligible, because of the potential of ASPs to promote equitable developmental opportunities for children.

#### 2.1.4. Study type

Eligible studies were systematic reviews and meta-analyses, whether peer-reviewed or published as reports, from 2010 onward. The starting year (2010) was chosen based on the publication of a seminal meta-analysis by Durlak et al. (2010) which evaluated ASPs targeting social and personal skill development. To be included in this umbrella review, articles had to meet standard criteria for systematic reviews. Specifically, they needed to be explicitly identified as a systematic review in the title or abstract, follow recognized reporting standards such as

PRISMA, or provide a detailed description of the search and selection process, including database use, inclusion criteria, and study screening procedures. Studies lacking transparency in methodology or failing to report a replicable review process were excluded. Primary or original empirical studies, as well as narrative and rapid reviews, were excluded to ensure inclusion of studies offering the highest level of evidence synthesis. No restrictions were placed on country of origin.

## 2.2. Search strategy

The review adhered to the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) statement (Page et al., 2021). A systematic search was conducted in four electronic databases: Web of Science, PsycINFO, ERIC, and Scopus. Searches were performed using titles, abstracts, and keywords, based on a combination of four thematic elements:

1. After-school programs – e.g., after-school program, extracurricular, out-of-school time, informal learning, extended day.

2. Social and emotional learning (SEL) outcomes – e.g., social and emotional learning, youth development, wellbeing, self-awareness, social skills.
3. Children – e.g., children, youth, students, elementary/middle school.
4. Study type – e.g., systematic review, meta-analysis, systematic literature review.

An initial search yielded over 500 results after deduplication, many of which were irrelevant (they were not systematic reviews, they were focusing on older children/young adults, or they were not about ASPs). Search terms were refined based on the articles that were considered relevant. The search was supplemented with manual reference list checks and Google Scholar. The final search, limited to publications between 2010 and December 24, 2024, resulted in 234 references from electronic databases plus 9 references from the additional search. Following the deduplication process using RefWorks, a total of 178 records remained.

## 2.3. Selection process

Title and abstract screening was supported by ASReview (Van De

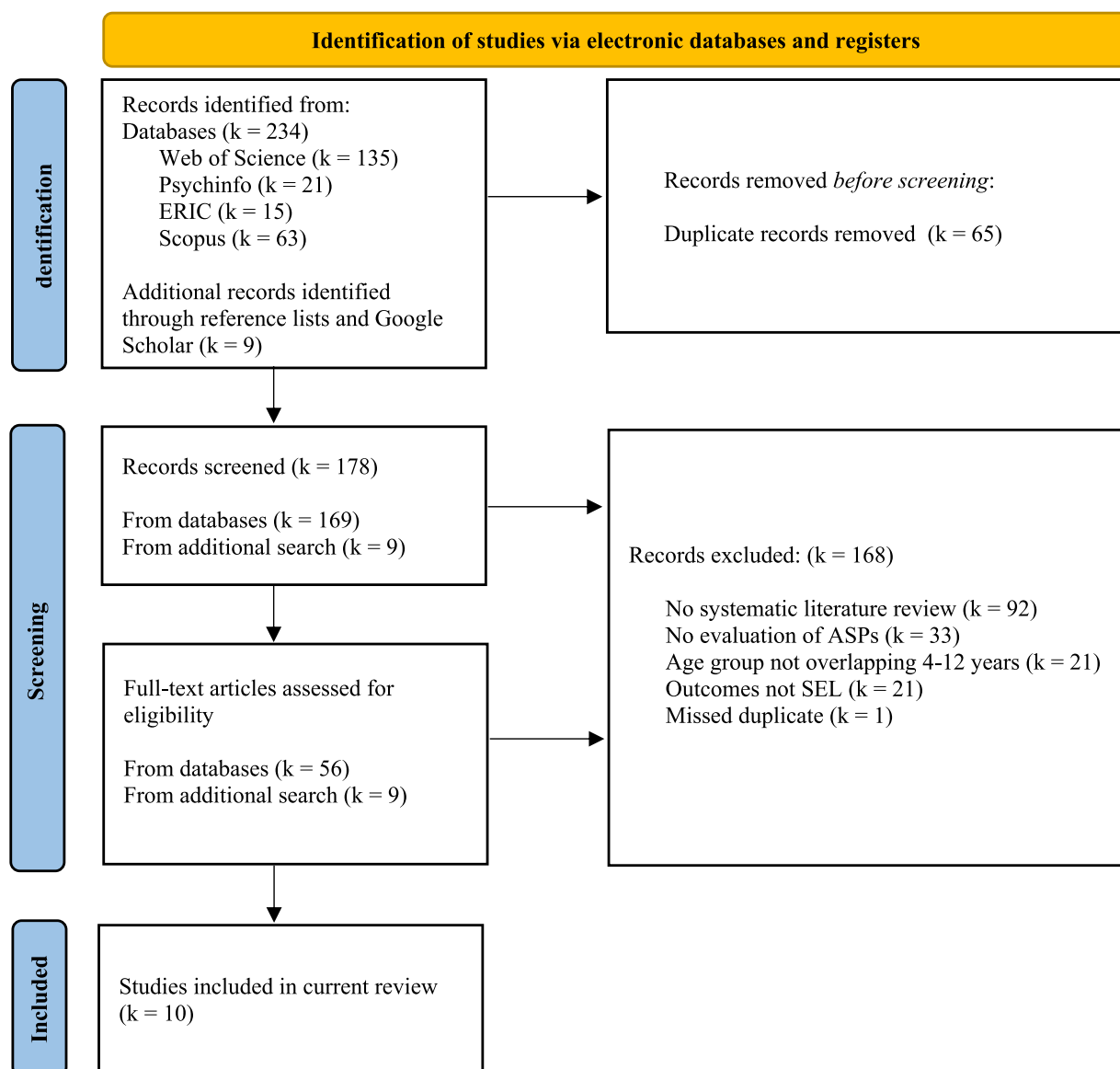


Fig. 1. Study selection process, PRISMA 2020 flow diagram.



Schoot et al., 2021), an open-source machine learning tool that facilitates systematic evidence screening through active learning. In this process, the user iteratively labels records to train the model. In addition to this assistance, all records were independently reviewed by the first author, as abstracts frequently lacked key information such as participant age. A total of 65 articles were included in the full-text screening. Of these, 21 % ( $n = 38$ ) were independently reviewed by one of the other authors. Initial agreement on eligibility was approximately 90 %, with any discrepancies resolved through discussion until consensus was reached. During full-text screening, studies were excluded for the following reasons: the article was not a systematic review ( $n = 92$ ); the target age group did not align with the current review's focus on children aged 4–12 years ( $n = 21$ ); the review did not focus on ASPs and their evaluation results ( $n = 33$ ); or the outcomes did not relate to social and emotional learning ( $n = 21$ ). After all rounds of screening, ten systematic reviews met the inclusion criteria. The results of the search and study selection process are presented in the PRISMA flow diagram, see Fig. 1.

## 2.4. Diversity of included studies

A comparison of the reference lists across the included systematic reviews revealed that only about 4 % of the primary studies overlapped. This limited overlap likely reflects differences in the reviews' focus—such as variations in program types, outcome domains, and geographical contexts. Additionally, the included studies were fairly evenly distributed over the publication period from 2010 to 2024.

## 2.5. Data extraction

A coding scheme was developed to facilitate data extraction and organization during the full-text review. Coding categories included:

- Study Characteristics: author/year, publication type, review type, adherence to review guidelines (e.g., PRISMA), objective, search strategy (databases, timeframe), number/type of included studies, geographic context, population and ASP characteristics (e.g. age, SES, intervention type and setting, duration).
- Outcomes: key findings, SEL-related outcomes, mediating/moderating factors, limitations, and identified knowledge gaps.

Two authors collaboratively refined the coding scheme using one of the included reviews as a reference point. Reviews were then coded in MAXQDA (VERBI Software, 2025), to be able to systematically categorize main outcomes and relevant mediating and moderating factors.

## 2.6. Synthesis

Given the broad scope of ASPs and SEL outcomes covered, findings were synthesized narratively, incorporating both qualitative and quantitative evidence. Results were organized by type of ASP (general ASPs and content-specific extracurricular activities) and by contextual or structural features influencing program effectiveness. The quantitative results from meta-analyses included varying statistical models and effect size measures. The reported effect size measures were Standardized Mean Difference (SMD), Hedges'  $g$  and Cohen's  $d$ . We report the original effect sizes since they were all standardized mean differences (Lin & Aloe, 2021). SMDs of 0.2, 0.5, and 0.8 are considered small, medium, and large effects, respectively (Andrade, 2020).

## 3. Results

### 3.1. Description of studies

Table 1 outlines the study characteristics of the included systematic reviews. The ten included systematic reviews were published between

2010 and 2024, with eight appearing as peer-reviewed journal articles and two as comprehensive policy reports. Five of the reviews incorporated meta-analytic techniques. The number of databases searched ranged from one to twelve, with most studies conducting additional searches through journal-specific databases and relevant websites. Search spanned the period from 1980 to February 2024.

The number of primary studies included in the reviews ranged from six to 148. The majority of the primary studies were conducted in the United States, with additional studies originating from Brazil, China, Croatia, Ethiopia, Indonesia, Ireland, New Zealand and United Kingdom. Most of the included reviews included both studies with randomized controlled trials and quasi-experimental designs. In addition, three reviews incorporated qualitative studies to provide contextual insights and deepen the understanding of program implementation and outcomes.

### 3.2. Description after-school programs and population characteristics

Table 2 presents descriptions of after-school programs (ASPs) evaluated in the included systematic reviews and population characteristics. The included reviews investigated a range of after-school programs (ASPs), broadly defined to include not only traditional, general ASPs, but also more content specific extracurricular activities. Although both types of provision aim to support children's development beyond formal schooling, we propose to distinguish them in terms of structure, purpose, and accessibility.

General ASPs are typically organized, adult-supervised initiatives held outside regular school hours and running consistently throughout the academic year. Among the included reviews, five assessed general ASPs excluding summer programs (Christensen et al., 2023; Durlak et al., 2010; Lester et al., 2020; Neild et al., 2019; Pelcher & Rajan, 2016). They often provided a mix of academic support, recreational activities, and social and emotional learning, and were frequently designed to support children at risk of school failure or from socioeconomically disadvantaged backgrounds. Two of the included reviews used terms other than ASPs, although the program descriptions aligned with the operational definition of ASPs used in the current review. Kidron and Lindsay (2014) focused on *increased learning time* programs, including extended school days and summer schools, primarily aimed at enhancing academic achievement. In contrast, Ciocanel et al. (2017) reviewed studies on positive youth development (PYD) interventions, which were explicitly designed to support social and emotional development.

Among the included reviews, three reviews examined content-specific extracurricular activities, including STEM (Alexandre, Xu & Washington-Nortey & Chen, 2022), music (Zheng, Abdullah, Zaremohzzabieh & Razali, 2024), and a range of organized activities such as sports, theater, and scouting (Rahayu & Dong, 2023). These extracurricular activities were generally interest- or skills-based and could vary in intensity. While ASPs were often publicly funded or delivered in partnership with community organizations to support equitable access (Neild et al., 2019), extracurricular activities more commonly relied on parental contributions and were more accessible to children from higher-income families (Alexandre et al., 2022; Rahayu & Dong, 2023).

Two included reviews about general ASPs specifically examined programs targeting children from socioeconomically disadvantaged backgrounds—described, for instance, as children from low-income families, children who were performing below grade level (Christensen et al., 2023), or children living in low-income urban neighborhoods (Pelcher & Rajan, 2014). The three reviews about extracurricular activities focused on universal programs. The remaining five reviews included a combination of both universal and targeted programs.

The majority of ASPs were delivered in community or school settings outside of regular school hours. More specialized extracurricular activities were also conducted in community-based environments such as

**Table 1**  
Overview of Included Systematic Reviews; Study Characteristics.

Author(s) & year	Article/report	Type of review	Followed guidelines	Objective	Databases and date range of search	Included studies (k, design, published/unpublished research)	Continents
Alexandre et al., 2022	Journal Article	SR <sub>a</sub>	PRISMA	To explore the impact of informal STEM learning (ISL) on school readiness, and to examine the relationship between ISL and children's social-emotional development, particularly for dual language learners	ERIC, All ProQuest, Education Research Complete, PsycInfo 2010 - August 2021	k = 36 22 used quantitative methods (including experimental, correlational, and descriptive designs), 9 used qualitative methods (primarily case studies), and 6 used mixed methods approaches, only empirical and published by peer-reviewed journals	Varying; i.a. United States, China, Brazil (not specified for all included studies)
Christensen et al., 2023	Journal Article	SR & MA <sub>b</sub>	quality methods outlined by Cochrane and the Campbell Collaboration	To examine the overall effectiveness of ASPs on internalizing, externalizing, school-related, social functioning, and self-perception/identity outcomes among kindergarten through 12th grade youth with marginalized identities	Academic Search Premier, ERIC, ProQuest Dissertations and Theses, PsycINFO, Social Sciences Citation Index, Social Services Abstracts, Social Work Abstracts, Sociological Abstracts May 2014 - June 2019 + all records identified from search Kremer et al. (2015) Same databases 1980 - May 2014	k = 56 Both randomized controlled trials (RCTs) and quasi-experimental design studies, published and unpublished works	United States (91,23 %), United Kingdom (8,77 %)
Ciocanel et al., 2017	Journal Article	SR & MA	PRISMA	To synthesize evidence on the effectiveness of positive youth development interventions in young people aged 10–19 years. We also examined whether the variation in the effects was moderated by study, intervention and participant characteristics	Applied Social Sciences Index and Abstracts, Medline, PsycINFO, Embase, CINAHL Plus, ERIC, Social Services Abstracts, Cochrane Central Register of Controlled Trials in the Cochrane Library, BibioMap and Trials Register of promoting health interventions); a search of relevant registers and youth work-related websites (e.g. National Youth Agency, National Council for Voluntary Youth Services (NCVYS) Publications, 4-H); reference list screening from previous reviews (e.g., Dickson et al. 2013; Harden et al. 2006; Morton and Montgomery 2011) and articles identified through electronic databases; information from researchers on unpublished or ongoing articles or to clarify reports identified through other sources 1985 – July 2015	k = 24 All 24 studies employed randomized controlled designs. Studies were eligible if they were randomized controlled trials and used a control condition to evaluate positive youth development interventions. Waiting list or no treatment, treatment as usual or alternative treatments were all considered valid control conditions; Both published and unpublished documents	United States (k = 20) and the remaining four were conducted in Croatia, Ireland, UK and New Zealand
Durlak et al., 2010	Journal Article	MA	Not reported	To examine the outcomes of after-school programs (ASPs) that seek to enhance children's personal and social skills. The study had two primary goals: 1) to assess the nature and magnitude of gains from such programs, and 2) to identify features that characterize more effective programs	ERIC, PsycInfo, Medline, Dissertation Abstracts + American Journal of Community Psychology, Journal of Community Psychology, and Journal of Counseling Psychology) + database on after-school research maintained by the Harvard Family Research Project (2009). Jan 1980 - dec 2007	k = 75 Of the 68 studies analyzed, 35.3 % used randomized experimental designs, 64.7 % used quasi-experimental designs, both published and unpublished research. The majority (68 %) of studies were unpublished technical reports or dissertations	United States
Kidron & Lindsay, 2014	Generic (report)	SR & MA	Standardized data extraction using	To examine the effects of: different types of increased learning time approaches,	Academic Search Premier, Education Research Complete, Education Full	k = 30 Both experimental (randomized controlled	United States

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Table 1 (continued)

Author(s) & year	Article/report	Type of review	Followed guidelines	Objective	Databases and date range of search	Included studies (k, design, published/unpublished research)	Continents
			WWC study review guides	program characteristics (like instructor qualifications), effectiveness for at-risk students, effectiveness across different locations (urban/suburban/rural), and effectiveness across different grade levels (in order) to provide education practitioners and researchers with credible information about which types and features of increased learning time programs are most likely to produce desired student outcomes	Text, ERIC, JSTOR, Professional Development Collection, ProQuest, PsycARTICLES, PsycEXTRA, PsycINFO, Psychology and Behavioral Sciences Collection, SocINDEX with Full Text. From 1998 onwards	trials) and quasi-experimental studies, Journal articles, technical reports, and doctoral dissertations	
Lester et al., 2020	Journal Article	SR & MA	Campbell Collaboration standards	1) To analyze a comprehensive sample of studies examining afterschool program effects on secondary students' academic and social-behavioral outcomes, and 2) To investigate how study quality impacts overall findings, addressing limitations of previous meta-analyses that excluded lower-quality studies	ProQuest, PsycINFO, ProQuest Dissertations and Theses, ERIC. + specific journals, particularly the American Journal of Community Psychology and Journal of Community Psychology. + websites and databases that typically publish program evaluations, including Child Trends, Afterschool Alliance, and the What Works Clearinghouse. 1997 - Sept 2018	k = 30 5 studies used experimental designs with randomization, while the remaining were quasi-experimental studies. (73 %) were unpublished, with 20 being dissertations.	United States
Neild et al., 2019	Report	SR	pre-drafted protocol that specified study eligibility criteria, evidence standards, and information recording requirements	To systematically review and summarize evidence on the effectiveness of specific afterschool programs, based on comprehensive analysis of studies published since 2000. The aims is to help decision-makers identify effective afterschool programs that meet ESSA (Every Student Succeeds Act) evidence requirements	Academic Search Complete, EconLit, ERIC, Education Research Complete, JSTOR, PsycInfo, ProQuest Dissertations and Theses, Web of Science. 2000- July/August 2017	k = 148 Two main types of research designs: (1) experimental designs/randomized controlled trials where students were randomly assigned to program and comparison groups, and (2) quasi-experimental designs that compare outcomes between program participants and comparison groups without random assignment, both peer-reviewed and non-peer-reviewed sources; 52 dissertations, 47 journal articles, 48 reports, 1 conference paper	United States
Pelcher & Rajan, 2014	Journal Article	SR	Not reported	To identify evidence-based barriers and facilitators to after-school programming in urban middle and high school environments. The study focuses on implementation challenges and best practices while examining implications for improving academic engagement and social-emotional development among adolescent youth	ERIC, + additional searches in PubMed and Google Scholar. January 2004 - March 2015	k = 25 Both qualitative and quantitative research methods, both peer-reviewed articles and program/policy reports	United States
Rahayu & Dong, 2023	Journal Article	SR	PRISMA	To determine the relationship between extracurricular activities and student character education, while also identifying factors that can strengthen or weaken the relationship between these two elements	Science Direct, ERIC, Proquest, Garuda (Garba Reference Digital), CNKI (China National Knowledge Infrastructure Database). 2018–2022	k = 50 Various research types, primarily qualitative case studies and survey methods, articles used from Research journals and proceedings journals	Varying; Indonesia, Ethiopia, China (not specified for all included studies)

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Table 1 (continued)

Author(s) & year	Article/ report	Type of review	Followed guidelines	Objective	Databases and date range of search	Included studies (k, design, published/unpublished research)	Continents
Zheng et al., 2024	Journal Article	SR	PRISMA	To investigate how extracurricular music activities influence primary school students' emotional and social development, with particular focus on examining the growing trend of parental enrollment in such activities	ProQuest, Scopus, Web of Science, ProQuest Dissertation & Theses. Inception - February 2024	k = 6 Correlational studies examining relationships between extracurricular participation and outcomes, cross-sectional parent-child surveys, and longitudinal research tracking activity engagement over time, both peer-reviewed articles and grey literature	United States, China

Note. <sup>a</sup>SR = Systematic review; <sup>b</sup>MA = Meta-analysis.

scouting groups, church clubs, and sports organizations (Rahayu & Dong, 2023; Zheng et al., 2024). Alexandre et al. (2022) additionally referenced informal STEM learning settings, including institutions such as museums, zoos, aquariums, and botanical gardens.

Program quantity and duration varied across the included reviews, with most describing ASPs as taking place “throughout the school year”. However, more detailed information on program intensity and duration was limited. Similarly, information regarding staff qualifications and training was scarce. Kidron and Lindsay (2014) noted that while many programs employed certified teachers, others relied on trained university students or volunteers. Neild et al. (2019) reported that some programs were staffed by university student volunteers, whereas others were implemented by local education agencies or community-based organizations. Several reviews did not specify staff characteristics or indicated that such information was absent from the original empirical studies.

Six of the ten included reviews did not report total participant sample size. Among the four that did, total sample sizes ranged from 23,258 to 347,683 participants. Six reviews provided information regarding the control conditions used in the majority of the included primary studies. These conditions were typically “no treatment” or “business-as-usual” comparison groups. Several reviews included studies with randomized control groups, and some noted that comparison groups may have participated in alternative community or after-school programs. Four reviews did not report details concerning the control conditions of the included primary studies.

3.3. The impact of after-school programs on children’s social and emotional learning

Table 3 gives an overview of the outcomes of the included systematic reviews. Across the ten included review, a variety of SEL outcomes were examined. These included overall social and emotional competencies or development, social functioning, pro-social and positive social behavior, self-perception and identity development, feelings and attitudes, and psychological and behavioral adjustment.

Below, the findings from reviews examining the impact of general ASPs on SEL are presented first, followed by an overview of the associated mediating and moderating factors. Subsequently, the outcomes of reviews focusing on content-specific extracurricular activities are discussed, alongside key contextual and program-related factors influencing their effectiveness.

3.3.1. General after-school programs

Systematic reviews and meta-analyses examining general after-school programs (ASPs) provided mixed but largely promising evidence regarding their impact on children’s SEL. The meta-analysis from Durlak et al. (2010) indicated that these programs generally have a positive and statistically significant impact on participating children.

Specifically, ASPs (mostly universal programs) significantly improved children’s self-perceptions (standardized mean difference [SMD] = 0.34), school bonding (SMD = 0.14), positive social behaviors (SMD = 0.19), and reduced behavioral problems (SMD = 0.19).

Similarly, Christensen et al. (2023) reported a small but significant overall effect of ASPs on child outcomes ( $g = 0.205, p = .001, 95\% \text{ CI} = 0.08\text{--}0.33$ ). The positive changes were observed across multiple developmental domains, such as social-emotional competencies, interpersonal skills, mental and behavioral health, academic outcomes, and identity formation. However, the authors noted that the type of youth outcome did not significantly moderate overall effects, suggesting that ASPs primarily support broad, general developmental gains rather than domain-specific improvements.

Pelcher and Rajan (2016) further highlighted that after-school programs (ASPs) have significant potential to address structural challenges commonly found in urban educational environments, such as teacher turnover and overcrowded classrooms. Authors stated that ASPs provided students with opportunities for personalized instruction, exposure to new subject areas, and the development of practical skills. Participation in these programs, particularly within smaller learning communities, was associated with an enhanced sense of belonging, identity, and self-efficacy—factors that are often difficult to foster in larger, more impersonal urban classroom settings. Furthermore, students living in urban areas who engaged in ASPs were more likely to report increased self-esteem, improved attitudes, greater self-confidence, and improved social behavior. These affective gains positively influenced students’ academic, social, and behavioral development. In addition, ASPs promoted civic engagement, especially among middle and high school participants, by fostering stronger connections with the community.

The interventions investigated by Ciocanel et al. (2017) were positive youth development (PYD) programs, defined as voluntary educational initiatives aimed at fostering positive development in young people (National Youth Agency, 2007). To qualify, programs had to address at least one of the 12 developmental goals outlined by Catalano et al. (2002, cited by Ciocanel et al., 2017), which span across the social domains of school, community, and family. These goals include fostering competencies (e.g., social, emotional, cognitive, behavioral, moral), self-determination, resilience, positive identity, belief in the future, recognition for positive behavior, and opportunities for prosocial behavior and norms. Ciocanel et al. (2017) reported that positive youth development interventions had a small but statistically significant effect on psychological adjustment ( $g = 0.17; 95\% \text{ CI} = 0.04, 0.31; p < .05$ ), while failing to yield significant improvements in behavioral outcomes or positive social behaviors ( $g = 0.04; 95\% \text{ CI} = -0.11, 0.21; \text{ns}$ ).

Other reviews provided even more cautious conclusions regarding ASP effectiveness. Neild et al. (2019) reported mixed findings concerning the impact of after-school programs (ASPs) on children’s development, with social and emotional competencies examined as part of a broader range of academic-related outcome measures. The authors



**Table 2**

Overview of Included Systematic Reviews; Population Characteristics and Description of After-School Programs.

Author(s) & year	Total sample size	Population characteristics (age range, sex, SES, other)	Universal/ Targeted Programs	Comparison group/condition	Type of after-school programs and setting	Description of after-school programs	Quantity/ duration	Qualification of professionals
Alexandre et al., 2022	Ranging 23–2163 children for quantitative studies, ranging 1–392 for qualitative studies	3–18 years, with approximately even gender distribution, of studies reporting demographics, participants were predominantly White, followed by Black and Latinx. Only nine studies reported socioeconomic status	(generally) universal	Unclear / not specified for all included studies	Three main types of sites for informal STEM learning (ISL): children's homes, afterschool programs and informal stem learning sites (ISLS) such as museums, zoos, aquariums, and botanical gardens	The after-school programs focused on STEM-based activities that promoted engagement through hands-on learning	Unclear / not specified for all included studies	Unclear / not specified for all included studies
Christensen et al., 2023	overall $n = 128,538$	Kindergarten through 12th grade, mean age of 10.73 years. Gender distribution showed approximately 50.91 % male participants. The majority were youth of color, with African American/Black students representing the largest group (49.12 %). Most youth (76.23 %) qualified for free/reduced lunch (as indicator of SES).	Targeted (youth with marginalized identities, including those from low-income backgrounds, youth of color, students performing below grade level, those attending low-performing schools, or youth engaging in risky behaviors)	nothing/waitlist controls (75.44 % of studies), treatment as usual (14.04 %), and alternative treatment (10.53 %). Some control group youth may have been participating in other community programs, though this was often unmeasured in the studies	ASPs that operated during the regular school year. Summer-only programs were explicitly excluded from the analysis. Settings were mostly community-based organization (50,9 %) and school (36,8 %).	Programs were required to offer multiple activities and help students meet academic standards and to offer a broad array of enrichment activities to complement their regular academic programs	Varying frequency and duration (during the school year): some met daily (22,8 %), others 3–4 times per week (33,3 %), twice a week (15,8 %), and some only once weekly (8,8 %). Session lengths ranged from <1 hour to 4+ hours, with most sessions between 1–4 h	Unclear / not specified for all included studies
Ciocanel et al., 2017	Overall $n = 23,258$	10–19 years, elementary school (12 %), middle school (37.5 %), high schools (25 %) or a mixture of grade levels (25 %). The predominant race studied was African American (58.3 %), followed by Caucasian (37.5 %) and Native American (4 %). Most studies included mixed-sex samples, with three studies focusing exclusively on females.	Both targeted and universal programs. Fifteen studies focused on at-risk students (targeting populations like low-income backgrounds, racial/ethnic minorities, and low academic achievers), six focused on low-risk students, and three included both	Comparison conditions included: seven studies used usual care groups (like regular sex education or standard drug education), seven used an alternative treatment, and nine used no treatment or wait-list controls	Positive youth development interventions, described as voluntary educational programs aimed at promoting positive development. Programs were delivered in various settings: in community settings ( $n = 5$ ), schools (outside school hours, $n = 4$ ), and in mixed settings combining school, community and family domains ( $n = 15$ ).	21 multi-modal programs, primary after-school activities covered academic and homework help ( $n = 8$ ), mentoring ( $n = 7$ ), community service projects ( $n = 9$ ), social or cognitive/ emotional skill development ( $n = 16$ ), recreational activities ( $n = 6$ ) and job clubs ( $n = 2$ ). Three single-modal programs provided mentoring, skills training or academic components. Five interventions were delivered in a group, two were delivered individually, and the remaining seventeen combined	The mean intervention duration was 80 weeks, with programs ranging from 3 - 240 weeks in length. Seventeen interventions involved at least 20 sessions. Programs needed to be stable and long-lasting to allow participants sufficient time to form and benefit from positive relationships.	Unclear / no information

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Table 2 (continued)

Author(s) & year	Total sample size	Population characteristics (age range, sex, SES, other)	Universal/ Targeted Programs	Comparison group/condition	Type of after-school programs and setting	Description of after-school programs	Quantity/ duration	Qualification of professionals
Durlak et al., 2010	Sample sizes not explicitly reported	Elementary (46 %), middle (37 %), and high school (9 %) students. Regarding socioeconomic status, 25 % served primarily low-income youth, 19 % served mixed-income levels, while 46 % didn't report SES. Many studies (36.8 %) did not specify ethnicity, though some programs predominantly served African American, Latino, Asian/ Pacific Islander, or American Indian youth.	The majority of ASPs (89.7 %) were universal interventions with no specific problems required for participation, while only 10.3 % targeted youth with specific presenting problems	The studies used control groups who did not participate in the specific after-school programs being evaluated, though some control participants were found to be engaging in alternative ASPs or other out-of-school activities. This makes it difficult to establish a true "no intervention" comparison group	Organized ASPs had to have adult supervision and operate during at least part of the school year, outside of normal school hours. Summer camps, adventure education, and extra-curricular school activities were explicitly excluded. Programs included those run by Boys and Girls Clubs, 4-H Clubs, and various community and civic organizations.	individual and group interventions. All included programs needed to have the development of youth's personal or social skills as one of their goals. Programs included social, cultural, and recreational activities run by organizations like Boys and Girls Clubs.	Most programs ran for <1 year (66.2 %), while 17.6 % lasted 1–2 years, and 16.2 % operated for >2 years. Several studies reported attendance challenges, with some programs having only 15–26 % attendance rates. Unfortunately, many studies did not provide detailed information about frequency and duration of sessions.	Unclear / no information
Kidron & Lindsay, 2014	Based on the documented sample sizes across the included studies, the total combined sample included over 25,000 students	The studies primarily included K-12 students, with many focusing on students from low-income households. Most participants were elementary and middle school students, with fewer high school students.	Both targeted and universal programs. Some ASPs specifically targeted students performing below academic standards, those with ADHD, or students from low-income backgrounds. Other programs were universal.	All included studies had a "business-as-usual" comparison group. Studies had to demonstrate baseline equivalence between intervention and comparison groups.	4 main types of increased learning time programs: out-of-school programs (before-school, after-school, and weekend programs), summer schools, expanded learning time schools, and year-round schools. Most of the 30 included studies (26) evaluated out-of-school programs (that operate on school campuses or at other sites such as community centers and college campuses) and summer schools	The programs typically offered academic instruction in literacy, math, and science combined with enrichment activities like arts, sports, and recreation. Some programs used traditional teacher-directed instruction style, and others experiential learning approaches (such as hands-on, inquiry-based instruction).	The programs varied in duration and intensity, typically ranging from 2–4 h per day, 2–5 days per week. For example, AfterZone offered 2.5 h daily, four days a week, while the Challenging Horizons Program ran 2 h twice weekly for 8–20 weeks.	Most programs included certified teachers, though some used trained university students and volunteers.
Lester et al., 2020	Total n = 347,683 students. one study accounted for 338,435 of these students, the remaining 29 studies had a combined sample of 9248 students	The studies included students aged 11–16 years (mean 12.23), with gender typically split equally. Most samples (85 %) comprised over 50 % low-income students. Race/ ethnicity varied, with Black students predominant in	Programs serve both universal and targeted populations.	Most (20 studies) simply compared participants to non-participants, while five studies used randomization and five used matched comparison groups. However, many studies lacked	ASPs met four criteria: 1) regular meetings throughout the school year, 2) adult supervision, 3) variety of activities including tutoring and recreation, and 4) structured group activities. Summer	ASPs provided structured activities supervised by adults, offering a variety of components including tutoring, group activities, and recreation. Programs following the SAFE (sequenced, active, focused,	The programs met regularly throughout the school year, with weekly contact ranging from 2–5 times per week across studies. However, detailed information about specific session durations and total	Unclear / no information

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Table 2 (continued)

Author(s) & year	Total sample size	Population characteristics (age range, sex, SES, other)	Universal/ Targeted Programs	Comparison group/condition	Type of after-school programs and setting	Description of after-school programs	Quantity/ duration	Qualification of professionals
		37 % of studies and White students in 27 %. However, many studies lacked complete demographic reporting		proper baseline measurements or randomization	programs were explicitly excluded	explicit) criteria were considered high-quality, though program quality varied across studies	program hours was largely unreported in most studies	
Neild et al., 2019	Sample sizes ranged from 11 to over 200,000 students, with a mean of 6604 and median of 264. About 30 % of studies had samples under 100 students, while over half (53 %) had fewer than 350 students. Total sample size across all studies is not reported	The studies covered different grade levels, with 57 studies (39 %) focusing on elementary school, 43 studies (29 %) on middle school, and 23 studies (16 %) covering multiple grade levels. Limited demographic information.	Both targeted and universal programs were included. While some programs specifically served low-income and underserved communities, others were more broadly implemented. Many federally funded programs particularly focused on providing access to low-income families and students in underperforming schools	Studies had to compare afterschool program effects to either a "no treatment" or "business as usual" control condition	The review focused specifically on voluntary after-school programs delivered during the school year outside regular school hours, either in school or community locations. Summer programs, combined afterschool/ summer programs, and extended school day programs were explicitly excluded from the review. Programs could be delivered by local education agencies, community organizations, or other public/ private entities	Included studies examined various program types: academic support/tutoring, multicomponent activities (combining academics, sports, and arts), physical activity/health programs, STEM activities, career/ leadership development, sports, and arts programs. Programs aimed to provide both academic enrichment and broader developmental activities in structured after-school environments	Unclear / no information	Limited information. Some programs used university student volunteers as staff, and others were implemented by local education agencies and community organizations.
Pelcher & Rajan, 2016	Sample sizes not explicitly reported	The studies focused on adolescent youth in grades 6–12 (middle and high school). Many participants were from urban, low-income neighborhoods, with a large Latino population mentioned in one example program. Neither specific gender breakdowns nor detailed socioeconomic status information were provided across the studies.	ASPs primarily targeted adolescent youth in urban environments	Unclear / no information	ASPs implemented in urban school environments. While some programs partnered with community organizations and universities, the primary intervention type was school-based after-school programming	No detailed description of ASPs. Best practices are described; (1) engagement in partnerships with local universities, nonprofit organizations, and/or government agencies (2) ASPs that followed the SAFE (sequenced, active, focused, explicit) approach; and (3) engagement in regular formative evaluation efforts and participate actively in outcome evaluation efforts	Limited information. One of the included studies suggests that 50–100 days of participation per academic year is considered ideal for program impact. Programs typically operated during after-school hours between 3:00–6:00 PM	Limited information. Though the review emphasizes that highly qualified, reliable staff members are crucial. School teachers who work during regular school hours are considered optimal after-school staff due to their training and existing investment in students. However, programs often struggle with staffing due to low wages and limited work hours, which leads to high turnover rates.
Rahayu & Dong, 2023	Sample sizes not explicitly reported	The review focused on preschool,	Universal	Unclear / no information	Extracurricular activities that were primarily	No detailed description of ASPs.	Limited information. The only quantitative	Limited information. One study

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Table 2 (continued)

Author(s) & year	Total sample size	Population characteristics (age range, sex, SES, other)	Universal/ Targeted Programs	Comparison group/condition	Type of after-school programs and setting	Description of after-school programs	Quantity/ duration	Qualification of professionals
		elementary, and secondary students. Limited demographic information.			school-based programs conducted under the guidance and supervision of educational institutions. Activities took place both within schools and outside school hours, with some programs involving community service activities (like scouting).	Various structured extracurricular activities including sports, theater, academic clubs, scouting, and religious programs. These activities were structured programs conducted outside of core subjects but under school supervision, aimed at developing students' potential, talents, interests, and character.	detail mentioned is a recommended duration of 3–4 h per week of extracurricular activities to help prevent juvenile delinquency	mentioned that teachers need to be competent and credible to gain students' trust and effectively motivate students
Zheng et al., 2024	Sample sizes not explicitly reported	The review focused on primary school students, with varying socioeconomic backgrounds. Limited demographic information.	Universal	Unclear / no information	The review focused on extracurricular music activities. Among music activities, included studies had a broader focus, also on other extracurricular activities like organized sports, church clubs and summer camps. The extracurricular activities took place in various settings including community centers and clubs	No detailed description of ASPs. While the review focused on music activities, extracurricular activities in the included studies also include other activities like sports, arts, and religious activities.	Unclear / no information	Unclear / no information

identified the social and emotional domain as one of the few areas in which the average effects of ASPs were not statistically significant. Furthermore, the relatively small number of studies and outcome indicators within this domain limited the precision and reliability of the estimated effect sizes.

Likewise, [Lester et al. \(2020\)](#) reported a very small and statistically non-significant negative treatment effect of ASPs on children’s social and behavioral skills ( $d = -0.05$ ;  $p = .80$ ; 95 % CI  $[-0.45, 0.36]$ ). Unlike earlier meta-analyses, this review included a substantial proportion of unpublished studies and study quality in the sample caused a high risk of bias. The authors confirmed their hypothesis that the inclusion of lower-quality studies significantly influences overall outcomes—yielding different conclusions than previous meta-analyses that restricted their samples to experimental studies with control groups and baseline measurements.

[Kidron and Lindsay \(2014\)](#) conducted a meta-analysis, focusing on the effect of increased learning time programs with academic components. The after-school programs typically offered academic instruction in literacy, math, and science combined with enrichment activities like arts, sports, and recreation. Other than the abovementioned reviews, the review of Kidron and Lindsay did include programs like summer schools and weekend programs as well. The review reported both academic and non-academic outcomes. They found only a negligible effect of these

programs on social and emotional skills ( $g = 0.03$ ).

**3.3.2. Factors related to the impact of general after-school programs**

**3.3.2.1. Program quality and SAFE practices.** The presence of the four recommended SAFE practices (Sequenced, Active, Focused, and Explicit learning strategies) was found to moderate several program outcomes. According to [Durlak et al. \(2010\)](#), only programs adhering to the SAFE framework produced statistically significant effects. In particular, SAFE programs were associated with substantial gains, including an average increase of 12 percentile points on standardized test scores (including self-perceptions, school bonding, positive social behaviors and problem behaviors relative to control groups ([Durlak et al., 2010](#)). Similarly, Pelcher and Rajan (2014) highlighted best practices for ASPs, underscoring the need for clear structure, defined goals, and rigorous evaluation, aligning with SAFE criteria.

Despite the general endorsement of the SAFE framework, findings concerning its impact on academic and behavioral outcomes were inconsistent. Another meta-analysis ([Lester et al., 2020](#)) reported that program quality (number of SAFE components a program included) was not associated with academic or behavioral outcomes. Again, it is important to note that this study mainly included unpublished research, and the overall sample was characterized by a high risk of bias due to

**Table 3**  
Overview of Included Systematic Reviews; Main Outcomes.

Author(s) & year	Outcome measures (SEL)	Conclusions	Mediating/moderating factors	Study limitations/knowledge gaps
Alexandre et al., 2022	STEM skills and interests, school readiness, <b>social-emotional development</b>	Findings of this systematic review suggest positive outcomes of informal STEM learning (ISL) on children's social-emotional development and STEM skills across various settings. These settings include homes, afterschool programs, museums and zoos, and field trips. Field trips complementing the curriculum positively affect social-emotional skills, with effects that persist over time. Technology activities in makerspaces also contribute positively to social development, addressing skills like communication, collaboration, and community building. Overall, ISL has a positive impact on social-emotional development, STEM engagement, identity, and career interest.	Afterschool programs enhance STEM skills through program duration, quality, staff training, and meaningful content connections. Results suggest that both the duration (at least 4 weeks) and quality of the program positively impacted students.	Very little research has addressed the impact of informal learning on preschool children's social-emotional competence.
Christensen et al., 2023	Overall effects on <b>internalizing, externalizing</b> , school-related, <b>social functioning</b> and <b>self-perception/identity outcomes</b>	Results from a meta-analysis of 56 studies indicate that ASPs have a "small, yet significant positive overall effect on youth outcomes" ( $g = 0.2049$ , $p = .001$ , 95 % CI = 0.08–0.33). The positive changes occur across various developmental domains, including social-emotional and interpersonal skills, mental and behavioral health, school success, and identity development. However, the authors note that specific youth outcome category did not significantly moderate overall effects, so ASPs rather contribute to youths' overall general improvement.	Moderator analyses revealed that the effects of ASPs differed based on the source of the outcome measure (e.g., self-report, teacher-report, official records) and the type of outcome measure (e.g., rating scales, surveys, archival reports). Specifically, youth self-report and teacher-reported outcomes showed larger effect sizes compared to official records. Rating scale/survey/checklist/questionnaire outcome measures also yielded larger effect sizes than archival reports/school records. However, other factors such as youth outcome category, youth characteristics, program characteristics, implementation fidelity, and training characteristics were not found to be significant moderators.	The authors caution that the significant heterogeneity detected in the study warrants further investigation into the factors that may influence the effectiveness of ASPs. Lack of detailed information in studies about ASPs, such as staff characteristics, implementation fidelity, and youth attendance, which limits the ability to conduct moderator analyses and draw generalizable conclusions. The heterogeneity of ASPs and the need for more specific evaluation of program practices are highlighted. Additionally, the importance of considering other supportive interventions and the context in which ASPs operate is emphasized.
Ciocanel et al., 2017	Behavioral problems, sexual risk behavior, academic achievement, <b>prosocial behavior</b> and <b>psychological adjustment</b>	Positive youth development interventions had a small but significant effect on academic achievement and psychological adjustment. No significant effects were found for sexual risk behaviors, problem behavior or positive social behaviors.	Interventions delivered to low-risk youth were more effective than those targeting high-risk populations. Trends that emerged; mentoring programs showed the most significant impact, particularly for psychological adjustment outcomes. Programs delivered in community-based settings and those lasting more than one year also demonstrated better outcomes.	Several methodological flaws and biases in the examined studies weaken the ability to draw strong conclusions. These include a lack of high-quality studies, small sample sizes, validity problems, and an overreliance on studies conducted in the US with specific populations.
Durlak et al., 2010	<b>Feelings and attitudes (child self-perceptions</b> and bonding to school); <b>indicators of behavioral adjustment (positive social behaviors</b> , problem behaviors, and drug use); aspects of school performance (achievement test scores, grades, and school attendance)	The review indicates that after-school programs (ASPs) generally have a positive and statistically significant impact on participating youth. <b>Specifically, the meta-analysis found that ASPs led to significant increases in self-perceptions</b> , bonding to school, <b>positive social behaviors</b> , school grades, and academic achievement test scores. Additionally, ASPs were associated with reductions in problem behaviors. ASPs can be an important community setting for promoting youth well-being and adjustment, but the use of evidence-based practices like SAFE is crucial for achieving the most positive outcomes.	An important finding was that the presence of four recommended practices (SAFE: sequenced, active, focused, and explicit) moderated several program outcomes. SAFE programs were associated with particularly strong gains, including an average difference of 12 percentile points on test scores compared to control groups. Only the SAFE programs yielded significant effects. Attendance was also positively related to youth outcomes, although the differences were not always statistically significant	The need to consider alternative activities of control groups and the impact of attendance and engagement levels on outcomes. The importance of detailed program descriptions and data on participant demographics. The lack of long-term data and the limitations of current statistical analyses. The potential influence of program quality and other unmeasured variables. The relevance of individual and ecological factors in determining program participation and success. The importance of staff training, skill generalization, and the integration of structured and unstructured activities.

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Table 3 (continued)

Author(s) & year	Outcome measures (SEL)	Conclusions	Mediating/moderating factors	Study limitations/knowledge gaps
Kidron & Lindsay, 2014	Academic motivation, literacy achievement, math achievement, <b>social-emotional skill development</b>	The review found that increased learning time programs had a negligible effect (0.03) on social-emotional skill development. This contrasts with previous meta-analyses that reported more positive outcomes. This review did not find that summer schools had a statistically significant effect on student outcomes.	Programs that used an experiential learning instruction style (such as hands-on, inquiry-based instruction) improved student social-emotional skill development (for example, self-confidence and self-management; four studies). Again, the effects were small. The review also found that programs explicitly teaching social skills led to increased positive social behaviors, though overall effects across general student populations remained minimal.	Because this study examined the data one category at a time, it does not provide information on how potential interactions among implementation features, such as how the effectiveness of experiential learning, might vary with teacher–student ratio or the frequency and duration of classes.
Lester et al., 2020	Academic achievement and <b>social / behavioral development</b>	The review indicates that the overall treatment effect of the programs examined was very small and not statistically significant. The findings suggest that published studies may be associated with higher effect sizes for academic outcomes, <b>but not for behavioral outcomes</b> . However, the researchers caution that these exploratory findings should be interpreted with care due to the high proportion of unpublished studies in the sample.	The moderator analyses did not reveal any significant differences. Additionally, the meta-regressions showed that study quality, in terms of selection bias, did not predict the magnitude of individual program effectiveness for either academic or behavioral outcomes. In contrasts with previous meta-analyses, program quality (number of SAFE components a program included) was not associated with academic or behavioral outcomes.	The majority of studies were unpublished reports, and study quality in the sample represented a high risk of bias. The authors emphasize the need for more rigorous study designs to improve the representativeness and clarity of meta-analytic outcomes. They point out the lack of published work on this specific population and limitations in existing studies, such as failure to report necessary data for calculating effect sizes and participant information. The authors suggest that future research should focus on program context, quality, and factors like student participation and engagement. Additionally, they recommend that evaluations should align with the program's logic model to accurately measure the intended outcomes. If sample sizes allow, disaggregating social and behavioral outcomes into separate categories could provide a more nuanced understanding of program impacts.
Neild et al., 2019	Attendance/enrollment, general achievement, mathematics achievement, physical activity/health, promotion/graduation, reading/ELA achievement, school engagement, science achievement, <b>social/emotional competencies</b> , and other achievement	The review found mixed results for social and emotional competencies, with this domain being one of the few that did not show statistically significant positive average effects. This domain also had fewer studies and findings than other domains, which contributes to the estimates being less precise	Program effectiveness was influenced by sample size and outcome measures used. Implementation quality was noted as critical - even programs with strong evidence of effectiveness are unlikely to generate benefits if not implemented with high fidelity to the model	Technical details, such as a standard deviation or sample attrition, was missing in some cases.
Pelcher & Rajan, 2016	Academic engagement and <b>social-emotional coping skill development</b>	The review discusses various barriers and challenges faced by ASPs, as well as the benefits they can provide to students, particularly those in urban areas. The main barriers identified include: (1) funding issues, (2) staffing challenges, such as high turnover and reliance on volunteers, (3) lack of interest and communication about ASPs among adolescent youth However, the review also highlights the potential benefits of ASPs, including: (1) providing personalized instruction, exposure to new subjects, and practical skills training for students, (2) fostering a sense of identity, self-efficacy, and improved social behavior in students, (3) Integrating with the school day to enhance students' learning experiences Overall, the review emphasizes the importance of overcoming the barriers to effective implementation of ASPs, as they have the potential to	To address these challenges, the review suggests that ASPs should: (1) Engage in partnerships to increase funding and access to resources, (2) Implement ASPs with clear structure, goals, and evaluation (SAFE practices), (3) Tailor programs to the specific needs and interests of the target population, especially older youth Skills-based programs that provide opportunities for older youth to assume a leadership role in the program have also shown to be an effective way to get students invested in ASPs, prevent attrition, foster positive attitudes about school, prepare them for future endeavors, and instill self-confidence in students who may feel insignificant in and/or disconnected from the school setting.	A lack of communication regarding available programming, cost and funding barriers for families in urban areas of low socioeconomic status, and a need to understand the preferences of older youth regarding program qualities, timing, and reasons for non-participation.

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Table 3 (continued)

Author(s) & year	Outcome measures (SEL)	Conclusions	Mediating/moderating factors	Study limitations/knowledge gaps
Puji Rahayu & Dong, 2023	Student character education / the development of student characteristics	significantly benefit students, particularly those in urban environments. The review discusses the positive relationship between extracurricular activities and the development of student character education. The review emphasizes that extracurricular activities are an important context for adolescents' educational and social development and that the relationship between extracurricular activities and character education is generally positive and mutually reinforcing. However, schools need to find effective ways to increase student participation in these activities.	Several key factors are identified that influence the relationship between extracurricular activities and the development of student character education; Internal school factors: Peers/friends; Extracurricular activities can channel adolescent energy in a positive direction and reduce behavioral deviations Teachers; Teachers can act as tutors/mentors to guide students in extracurricular activities, and competent, credible teachers can more effectively instill desired character values School climate; The principal's leadership and overall school organization are important for the success of extracurricular programs External school factors: Parents; Parental support, motivation, and involvement are crucial for student participation in extracurricular activities and character development	Schools need to carefully design extracurricular programs based on needs analysis and align them with the institution's vision and mission. Program organization is critical to achieving curriculum goals, and regular program assessments are necessary for improvement and development.
Zheng et al., 2024	Students' overall development	The review discusses the various benefits of extracurricular music education for primary school students. They highlight how music lessons can enhance students' cognitive abilities, discipline, creativity, collaboration, sense of achievement, stress relief, joy, and persistence. Also, the review states that engaging in music across various cultural contexts helps primary school students develop an appreciation for and respect towards cultural diversity. Overall, the review highlights the multifaceted benefits of extracurricular music education for primary school students' cognitive, emotional, and social development, as well as the importance of considering cultural contexts and parental involvement in supporting students' musical pursuits.	The review emphasizes the importance of direct interactions with peers and instructors during face-to-face music activities, as this provides immediate feedback and validation, fostering a sense of competence and autonomy in students. Observing their peers' progress also motivates students to improve their own musical skills. Additionally, the review suggests that parental values and support play a crucial role in shaping children's musical education and development. Educators and policymakers need to understand the diverse needs and values across different cultural contexts to create effective curricula and teaching methods.	Addressing factors that lead to decreased academic engagement and interest in extracurriculars is essential for educators and stakeholders to support students' growth and overall performance.

lower study quality.

3.3.2.2. *Program characteristics and delivery contexts.* Some specific program characteristics and delivery contexts were also identified as important moderators. Kidron and Lindsay (2014) reported a negligible overall effect of increased learning time programs on SEL. However, programs that incorporated experiential learning—rather than traditional instructional styles—showed modest positive effects on social and emotional outcomes, such as self-confidence and self-management, although these effects were small. 'Experiential learning approaches' refer to a teaching method focused on hands-on activities, project-based learning, and field trips as the main learning tasks. Unlike traditional instruction, which relies on direct teaching and following directions, experiential learning emphasizes children's engagement through real-world experiences. Examples include working with lab equipment in science centers, writing for the school newspaper, and designing projects in science and technology. Programs explicitly targeting social

skill development were associated with increases in prosocial behavior; however, the overall impact across general populations remained limited.

In line with these findings, Pelcher and Rajan (2016) found that skills-based programs offering leadership opportunities for older children effectively enhanced children's engagement in ASPs, reduced dropout from the programs, and promoted positive attitudes toward school. These programs also supported preparation for future endeavors and fostered self-confidence, particularly among children who may feel marginalized or disconnected within the school environment.

Ciocanel et al. (2017) identified several noteworthy trends related to program characteristics. Mentoring programs demonstrated the most significant impact, particularly in relation to psychological adjustment outcomes ( $k = 5$ ;  $g = 0.21$ ;  $p < .01$ ). Additionally, programs implemented in community-based settings were associated with more favorable outcomes compared to those delivered in school-based contexts. Similarly, interventions lasting more than one year yielded stronger

results than shorter-duration programs.

**3.3.2.3. Implementation fidelity.** Implementation quality emerged as critical factor influencing outcomes. Neild et al. (2019) stressed that implementation fidelity is essential and that even programs with strong empirical support may fail to produce benefits if delivered inconsistently. Attendance was generally positively associated with child outcomes, although variation in attendance rates were not always examined, and not always statistically significant (Durlak et al., 2010). However, Christensen and colleagues (2023) did not find implementation fidelity to be a significant moderator of outcomes. The authors noted that their analyses were constrained by the limited data available in the primary studies included in the meta-analysis, particularly due to missing information on key variables such as implementation fidelity and participants' actual attendance in the programs.

Additionally, Pelcher and Rajan (2014) identified several barriers to effective implementation, highlighting persistent challenges such as limited funding, staffing instability—including high turnover and reliance on volunteers—and a lack of interest or awareness about ASPs among children.

**3.3.2.4. Populations characteristics.** Findings from reviews on the effects of ASPs for children from socioeconomically disadvantaged backgrounds are mixed, due to different definitions of target populations and a lack of information about the background of participants or comparison groups.

Although Christensen et al. (2023) found that ASPs yielded small but significant improvements in behavioral, academic, and identity-related outcomes among children identified with characteristics associated with social marginalization (e.g., non-white race/ethnicity, low-income backgrounds or low academic performance), child characteristics were not found to be significant moderators. Ciocanel et al. (2017) reported that low-risk children - defined as those not facing substantial socioeconomic or academic disadvantages - tended to benefit more from positive youth development interventions than their high-risk counterparts. The authors suggested that future research should further explore variables - such as socioeconomic background, ethnicity, and access to or engagement with ecological resources (e.g., community services) - that are likely to play a significant role. Investigating these factors can help clarify which individuals are most likely to benefit from current positive youth development efforts and inform necessary adaptations to make these programs more accessible and effective for children from socio-economically disadvantaged backgrounds.

Pelcher and Rajan (2016) described structural barriers such as underfunding and insufficient staffing that continue to hinder the effectiveness of ASPs, especially in urban areas. They stressed that effective programs need to be tailored to the developmental needs and interests of the target population, particularly in the case of older children. Pelcher and Rajan also mentioned that research demonstrated that older youth are more likely to participate in an ASP if their friends also attend and can engage in some sort of socialization for at least a portion of the time.

**3.3.2.5. Methodological considerations and moderating variables.** Several methodological factors influenced reported outcomes. According to Neild et al. (2019), factors such as sample size and choice of outcome measures affected program effectiveness estimates. Christensen et al. (2023) found that outcome source (e.g., self-report, teacher report, official records) significantly influenced effect sizes. Outcome data based on children's self-reports or on teachers' reports data generally yielded larger effect sizes than archival or administrative data. Similarly, outcome measures based on rating scales, checklists, and surveys produced stronger effects compared to school records.

Lester et al. (2020) found no significant association between selection bias and program effectiveness through meta-regression analyses,

despite the fact that most studies in their sample employed non-experimental designs and were vulnerable to internal validity threats such as selection bias, attrition, and non-equivalent comparison groups. Additionally, a large proportion of the included studies were unpublished, raising further concerns about potential bias. While the review of Lester and colleagues (2020) provides a broad perspective by incorporating a wide range of study designs, it also highlights methodological limitations that compromise the reliability of effect size estimates. These findings underscore the need to carefully balance inclusivity with methodological rigor in meta-analytic research.

### 3.3.3. Content-Specific extracurricular activities

Findings from systematic reviews focusing on more specialized or content-specific extracurricular activities also revealed benefits for social and emotional development. STEM-focused after-school programs were found to support social and emotional development (Alexandre et al., 2022). These programs were designed to enhance children's engagement and skills in science, technology, engineering, and mathematics outside regular school hours. Programs often provided hands-on activities, interactive learning experiences, and opportunities to interact with real artifacts or participate in design challenges. Such programs positively influenced identity formation, career interest, interpersonal relationships, critical thinking, and perseverance, next to enhanced STEM skills and interests of children. Curriculum-linked field trips had a positive and lasting effect on children's social and emotional skills. Likewise, technology-based activities in makerspaces supported social development by fostering competencies such as communication, collaboration, and a sense of community.

Rahayu and Dong (2023) conducted a systematic review to determine the relationship between a range of extracurricular activities - including sports, theater, academic clubs, scouting, and religious programs - and student character education. Character education was described as a structured and systematic effort by a group of people or institution to internalize character values so students understand and act according to moral standards. It includes fostering virtues like honesty, responsibility, perseverance, caring, and courage, and emphasizes intellectual, emotional, and behavioral development, which matches several SEL outcomes. The evaluated activities were mostly structured programs conducted outside of core subjects but under school supervision, aimed at developing students' potential, talents, interests, and character. The review emphasizes that extracurricular activities are an important context for children's educational and social development and that the relationship between extracurricular activities and character education is generally positive and mutually reinforcing (Rahayu & Dong, 2023).

Zheng et al. (2024) focused more specifically on extracurricular music activities but included studies with a broader focus, also on other extracurricular activities like organized sports, church clubs and summer camps. They concluded that extracurricular music education has substantial cognitive, emotional, and social benefits. Music activities supported children's cognitive functioning, discipline, creativity, collaboration, sense of achievement, reduced stress and enhanced relief, joy, and persistence. Furthermore, engaging with music in diverse cultural contexts fostered greater appreciation for and respect toward cultural diversity (Zheng et al., 2024).

### 3.3.4. Important factors and barriers related to extracurricular activities

Alexandre et al. (2022) concluded that ASPs enhanced STEM skills through program duration, quality, staff training, and meaningful content connections. Results suggested that both the duration (at least 4 weeks) and quality of the program positively impacted students. Rahayu and Dong (2023) identified several school- and family-related factors that influenced the relationship between extracurricular activities and the development of student character education. Peer relationships played a key role, as they could channel children's energy in positive ways and help reduce behavioral problems. Teacher involvement—as

mentors and tutors—also proved important, with competent and credible educators more effectively instilling desired character values. Moreover, the overall school climate, including leadership and organizational support, contributed to the success of extracurricular programs. Parental encouragement and engagement further enhanced participation and played a meaningful role in fostering character development.

Zheng et al. (2024) echoed the importance of peers, teachers and parents, highlighting that parental involvement was identified as a key factor in maximizing the impact of extracurricular music programs, and that direct interaction with peers and instructors during face-to-face music education fostered students' sense of competence and autonomy. Observing peer progress also served as a motivating factor. In addition, the authors stressed the importance of aligning curricula and teaching methods with the cultural values and needs of diverse populations to enhance program effectiveness.

### 3.4. Limitations of studies and knowledge gaps

Although the included systematic reviews and meta-analyses provide important insights into the effectiveness of after-school programs (ASPs) on social and emotional learning (SEL), several methodological and contextual limitations were identified across studies.

Ciocanel et al. (2017) highlighted a lack of high-quality studies, small sample sizes, and overreliance on U.S.-based research, limiting the generalizability of findings. Similarly, Lester and colleagues (2020) reported that the majority of their included studies were unpublished and prone to selection bias, attrition, and use of non-equivalent comparison groups, raising concerns about internal validity. Neild et al. (2019) also noted missing technical details, such as standard deviations and attrition rates, which impeded precise effect size estimation.

Incomplete reporting on program characteristics was another recurring issue. Christensen et al. (2023) emphasized that many primary studies lacked critical details, including staff qualifications, implementation fidelity, and children's attendance rates, which constrained moderator analyses and weakened the interpretability of findings. Similarly, Durlak et al. (2010) stressed the need for comprehensive program descriptions, participant data, and long-term follow-up measures to better understand program effectiveness. Kidron and Lindsay (2014) pointed out that their analysis did not explore interactions between program characteristics, such as the relationship between teacher-student ratio and experiential learning quality.

Across reviews, program heterogeneity was a key theme. Both Christensen et al. (2023) and Lester et al. (2020) emphasized the need for clearer differentiation and evaluation of diverse ASP models, highlighting that high variability in program type, implementation, and outcome measurement complicates cross-study comparison. Durlak et al. (2010) additionally called for more attention to the role of individual and ecological factors, such as alternative control activities and participant engagement, in shaping outcomes.

Finally, reviews underscored practical barriers and implementation challenges. Pelcher and Rajan (2016) noted that funding constraints, limited awareness, and insufficient alignment with older youth's preferences continue to hinder participation, especially in low-income urban areas. Rahayu and Dong (2023) stressed the importance of aligning extracurricular activities with institutional goals and regularly assessing program quality. Likewise, Durlak et al. (2010) highlighted the need for adequate staff training, integration of structured and unstructured activities, and the promotion of skill generalization as critical to effective after-school programs.

Taken together, these limitations suggest that, while evidence supports the potential of ASPs to enhance children's social and emotional development, more rigorous and detailed research is necessary to identify the conditions under which these programs are most effective.

## 4. Conclusion and discussion

This umbrella review synthesized systematic reviews and meta-analyses on the effectiveness of after-school programs (ASPs) in fostering children's social and emotional learning (SEL). The reviews encompassed both general ASPs—offering academic, recreational, and SEL support—and content-specific extracurricular activities, such as STEM and music activities. While these initiatives shared a common aim of supporting children's development beyond formal education, they differed in structure, goals, and accessibility.

Findings across seven reviews of general ASPs—including those labeled as positive youth development interventions or increased learning time programs—presented a cautiously optimistic picture. Most reviews reported positive effects on various SEL outcomes, including self-perception, social behavior, psychological adjustment, and identity development (Durlak et al., 2010; Christensen et al., 2023; Ciocanel et al., 2017; Kidron & Lindsay, 2014; Pelcher & Rajan, 2016). However, two reviews found no significant effects (Lester et al., 2020; Neild et al., 2019), likely due to the inclusion of lower-quality and unpublished studies and the limited number of studies reporting on SEL outcomes, compared to academic outcomes.

Additionally, three systematic reviews of content-specific extracurricular activities—including STEM and music activities—consistently showed positive effects on children's social and emotional development, including gains in identity formation, collaboration and social skills and perseverance (Alexandre et al., 2022; Rahayu & Dong, 2023; Zheng et al., 2024). These programs often combined hands-on learning with structured, supervised activities that foster both cognitive and interpersonal growth. Field trips that were integrated with the curriculum had a sustained positive impact on children's social and emotional development, as had technology-focused activities in makerspaces. Furthermore, participating in music activities rooted in diverse cultural contexts fostered primary school children's understanding of and respect for cultural diversity (Zheng et al., 2024).

For general ASPs, several moderating and mediating factors emerged across the reviews. High-quality programs that align with the SAFE framework tended to show more consistent positive outcomes (Durlak et al., 2010; Pelcher & Rajan, 2016), though findings across reviews varied, in part due to differences in study quality and methodological rigor. Specific program characteristics—such as experiential learning approaches, skills-based programs, and mentoring programs—appeared particularly effective, especially when implemented in community-based settings and sustained over longer durations (Kidron & Lindsay, 2014; Ciocanel et al., 2017).

Implementation fidelity also emerged as a critical factor. Reviews stressed that even well-designed programs may fail to yield benefits if inconsistently delivered or poorly resourced (Neild et al., 2019; Christensen et al., 2023). Yet many primary studies lacked data on fidelity, attendance, or staff qualifications, which constrained moderator analyses.

Findings about the moderation of target population characteristics were mixed. While evidence suggested ASPs benefit children from socioeconomically disadvantaged backgrounds (Christensen et al., 2023), other findings indicated that children not facing substantial socioeconomic or academic disadvantages may reap greater benefit (Ciocanel et al., 2017). This points to a need for differentiated program design and implementation strategies that reflect children's backgrounds, interests, and needs.

Methodological factors—such as outcome source, measurement tools, sample size, and study design—significantly influenced reported effect sizes across reviews, underscoring the need to balance comprehensiveness with methodological rigor to enhance the reliability and interpretability of meta-analytic findings (Christensen et al., 2023; Lester et al., 2020; Neild et al., 2019).

In reviews of extracurricular activities, program duration, quality, and staff training were also identified as critical components,



particularly in STEM-focused programs (Alexandre et al., 2022). Additionally, peer relationships, staff support, and parental involvement emerges as critical factors in maximizing program impact (Rahayu & Dong, 2023; Zheng et al., 2024). The findings suggested that extracurricular activities are most effective when they actively nurture high-quality interactions and social connections and when curricula and teaching methods are aligned with the cultural values and needs of diverse populations.

Taken together, the present findings indicate that general ASPs can support children's SEL and that content-specific extracurricular activities (e.g., STEM or music) further demonstrate strong potential to enhance SEL. However, the effectiveness of ASPs and extracurricular activities is highly contingent upon their design, the quality of implementation, and the extent to which they are responsive to children's developmental needs and interests. Moreover, the active involvement of peers, educators, and parents emerges as a critical factor in fostering meaningful engagement and positive outcomes.

Programs with specific thematic content, such as sports, arts, or music, tend to foster deep engagement and meaningful learning experiences. Although outside this review's inclusion criteria, existing evidence supports these benefits in different domains. An umbrella review of Boelens and colleagues (2022) shows positive associations between organized extracurricular sports and non-sports activities (e.g. arts, music) with children's mental health outcomes. Moon et al. (2024) report small-to-moderate positive effects of physical activity on children's mental health and SEL. Similarly, participation in sports has been linked to increased self-confidence, social competence, and internalization of social norms through modeling (Chowdhury, 2023; Eime et al., 2013). In parallel, music education has been shown to enhance emotional intelligence, academic performance, and prosocial behavior (Blasco-Magraner, Bernabe-Valero, Marín-Liébana & Moret-Tatay, 2021). Existing evidence suggests that incorporating content-specific components within ASPs may be particularly effective in fostering SEL, cultivating interests and promoting children's broad development. Aligning program content with children's interests—using strategies such as interest surveys (Sanderson & Richards, 2010, cited in Pelcher & Rajan, 2016)—can foster motivation and sustained participation.

In light of ongoing societal challenges—such as technological disruption, climate change, and social uncertainty—after-school programs (ASPs) offer a unique opportunity to serve not only as educational and emotional support systems, but also as spaces where children can engage with complex societal issues and develop future-oriented skills. To fulfill this potential, programs should incorporate opportunities for deep, meaningful learning that connects to children's everyday experiences.

However, recent evaluations suggest that this potential is not yet fully realized in practice. Instructional support in ASPs remains relatively weak (Fukkink & Boogaard, 2020; Hektner, Kole, Chinopfukwa & Carlson, 2024; Romijn et al., 2024), which points to a need for improvements in program design and delivery. These gaps also represent opportunities for growth and raises important questions about the role and competencies of professionals in ASPs. The study of Hektner and colleagues (2024), which assessed staff-youth interactions across various session types in ASPs, revealed that science-focused sessions were notably stronger in terms of instructional support. In such sessions, educators frequently employed varied and engaging instructional strategies, including scaffolding techniques that foster higher-order thinking, problem-solving, and creativity (Hamre et al., 2014; Pianta et al., 2008a, cited in Hektner et al., 2024). This finding suggests that science sessions may offer valuable models for staff training. Training staff to recognize and transfer these effective practices—such as the use of open-ended questions and rich vocabulary—across different content areas could enhance instructional quality throughout ASPs. It also underscores the benefits of content-specific elements in ASPs.

While the systematic reviews included in the current umbrella review offered limited insight into staff training, findings from Rahayu and

Dong (2023) emphasize the pivotal role of educators as mentors of children and youth, and as facilitators of their development. Beyond caregiving, professionals must serve as co-learners who build trust, inspire curiosity, and model enthusiasm - key elements for supporting both SEL and peer relationship development. In an era when much of children's interaction occurs online, ASPs offer an essential setting for face-to-face social learning. Engaging with peers in after-school programs (ASPs) can also support the development of essential foundational skills, including effective communication, critical thinking, perspective-taking, and self-regulation (Afterschool Alliance, 2023).

A key question remains: should after-school time prioritize academic reinforcement, SEL, or serve as a space for unstructured play and leisure? This review suggests an integrative approach; framing children's interests as a catalyst for broad development and learning (Akkerman & Bakker, 2019; Renninger & Hidi, 2015) may reconcile these competing goals. Interests are linked to intrinsic motivation, engagement, competence, and belonging (Bergin, 2016). When supported across school, home, and after-school contexts, children's interests can evolve into long-term drivers of learning and well-being. After-school environments are uniquely positioned to support this process. Their informal, relational climate enables strong adult-child and peer relationships that foster emotional growth and interest development (Philp & Gill, 2020). ASPs that integrate SEL and content-specific elements may provide opportunities for children to develop skills and discover interests and talents through guided, supportive activities. When grounded in real-world issues and children's interests, ASPs have the potential to serve as future-oriented learning environments that nurture curiosity, emotional resilience, and civic engagement.

#### 4.1. Limitations

This umbrella review mapped the diverse landscape of after-school programs (ASPs) and synthesized findings from systematic reviews assessing their effectiveness in promoting children's social and emotional learning (SEL). However, several methodological and contextual limitations restrict the strength and generalizability of the conclusions drawn. The wide variation in program types, target populations, outcome measures, and review methodologies complicates cross-study comparisons and makes it difficult to identify definitive best practices. Differences in program aims—such as the academic and preventive focus of general ASPs versus the skill-oriented emphasis of extracurricular activities—further limit comparability.

Across studies, common issues included small sample sizes, low study quality, incomplete reporting on key program characteristics (e.g., content, staffing, delivery), and high heterogeneity in program design and implementation. These factors hinder precise effect size estimation and the ability to draw nuanced conclusions. Moreover, nearly half of the included reviews—including all three on extracurricular activities—relied primarily on qualitative synthesis and lacked quantitative findings from meta-analytic techniques.

Practical challenges—such as inconsistent staff training, underfunding, and poor alignment with children's needs—further complicate effective implementation and evaluation of ASPs. Expanding rigorous and transparent research—especially through mixed-method and longitudinal designs—is essential to better understand what works, for whom, and under which conditions.

#### 4.2. Future research

Future research should prioritize rigorous, situated designs that are responsive to contextual variables, including implementation fidelity, participant characteristics, and setting-specific challenges. Longitudinal studies are particularly needed to assess the sustainability of SEL outcomes over time (Durlak et al., 2010; Ciocanel et al., 2017).

Christensen et al. (2023) called for better reporting on staff training, children's attendance, and program activities—data necessary for



identifying mediating and moderating effects. Greater attention should also be paid to SEL-specific outcomes and their interaction with contextual and program variables.

Furthermore, additional research is needed on the professional competencies required in ASP settings. While much is known about teacher quality in formal education, fewer studies address the roles, training, and impact of ASP professionals. Drawing on insights from early childhood education and positive youth development could offer a valuable foundation for identifying and strengthening these competencies. Moreover, future studies should explore whether a focus on interest development within ASPs can foster broad development and enduring outcomes for children.

#### 4.3. Implications for policy and practice

To realize the potential of ASPs, policy and practice must address three core dimensions: intentional design, workforce development, and equitable access. Programs should be tailored to needs and interests of children, incorporating opportunities for deep, meaningful learning that connects to children's everyday experiences.

Professionalization of the ASP workforce is essential. The findings of this review highlight the crucial role of ASP staff in guiding children's development, not only as caregivers but as mentors. Professionals are expected to engage as co-learners—fostering trust, sparking curiosity, and demonstrating enthusiasm—all of which are essential for promoting SEL, fostering high-quality adult-child interactions, and supporting the development of peer relationships.

Equity considerations must also remain central. ASPs have the potential to close opportunity gaps—especially for children from socio-economically disadvantaged backgrounds—by offering structured, high-quality, and developmentally enriching experiences. This requires stable funding and collaboration between schools, community organizations, and families to ensure alignment between children's needs and interests and the opportunities provided through ASPs.

In an increasingly complex world, ASPs can serve as adaptive, relationally supportive environments where children develop the skills, identities, and aspirations needed for a resilient and meaningful life. SEL may thus serve not only as a developmental goal in itself, but also as a vehicle for children's broad development.

#### Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work the authors used ChatGPT in order to improve language and readability of the text. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the published article.

#### CRedit authorship contribution statement

**Lisanne Jilink:** Data curation, Formal analysis, Investigation, Methodology, Project administration, Writing – original draft, Writing – review & editing. **Paul Leseman:** Conceptualization, Funding acquisition, Investigation, Supervision, Writing – review & editing. **Pauline Slot:** Conceptualization, Funding acquisition, Supervision, Writing – review & editing. **Mirjam Gevers:** Conceptualization, Funding acquisition, Supervision, Writing – review & editing.

#### Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

Lisanne Jilink reports financial support was provided by Partou Childcare. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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#### Supplementary materials

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