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Promoting Positive Youth Development Through School-Based Social and Emotional Learning Interventions: A Meta-Analysis of Follow-Up Effects

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This meta-analysis reviewed 82 school-based, universal social and emotional learning (SEL) interventions involving 97,406 kindergarten to high school students (M_{age} = 11.09 years; mean percent low socioeconomic status = 41.1; mean percent students of color = 45.9). Thirty-eight interventions took place outside the United States. Follow-up outcomes (collected 6 months to 18 years postintervention) demonstrate SEL's enhancement of positive youth development. Participants fared significantly better than controls in social-emotional skills, attitudes, and indicators of well-being. Benefits were similar regardless of students' race, socioeconomic background, or school location. Postintervention social-emotional skill development was the strongest predictor of well-being at follow-up. Infrequently assessed but notable outcomes (e.g., graduation and safe sexual behaviors) illustrate SEL's improvement of critical aspects of students' developmental trajectories.

Positive youth development (PYD) focuses on enhancing young people's strengths, establishing engaging and supportive contexts, and providing opportunities for bidirectional, constructive youth–context interactions (Larson, 2000; Lerner, Phelps, Forman, & Bowers, 2009; Snyder & Flay, 2012). Interventions that are grounded in the PYD framework, therefore, must move beyond a problem-oriented focus and address protective and risk factors across family, peer, school, and community environments that affect the successful completion of youths' developmental tasks (Catalano, Berglund, Ryan, Lonczak, & Hawkins, 2002). Operational definitions of PYD's key constructs vary—for example, the five Cs model (Lerner et al., 2009) or the external and internal developmental assets model (Benson, Leffert, Scales, & Blyth, 1998). However, they share a common focus on building young people's positive personal competencies, social skills, and attitudes (i.e., asset development) through increased positive relationships, social supports, and opportunities that strengthen assets and help youth flourish within their environments (i.e., environmental enhancement).

A systematic review of 25 PYD program evaluations indicated that PYD interventions operating in family, school, and community settings are indeed effective in promoting positive development in a broad range of outcome domains (Catalano et al., 2002). For example, the authors found that PYD interventions were successful in improving young people's self-control, interpersonal skills, problem

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solving, the quality of their peer and adult relationships, commitment to schooling, and academic achievement. Although these examples of asset development are the key outcomes of interest for PYD, some interventions have also decreased substance use, risk taking, and problem behaviors. PYD interventions, therefore, appear to foster positive outcomes and also be able to protect against negative ones. A variety of specific intervention strategies are compatible with the broad asset development and environmental enhancement orientation of PYD, such as service learning, mental health promotion, and social and emotional learning (SEL; Catalano et al., 2002; Tolan, Ross, Arkin, Godine, & Clark, 2016). School-based SEL is the focus of this review.

Similar to the goals of PYD, school-based SEL involves implementing practices and policies that help students and adults acquire and apply knowledge, skills, and attitudes that enhance personal development, social relationships, ethical behavior, and effective, productive work (Elias et al., 2015; Greenberg et al., 2003; Weissberg & O'Brien, 2004). SEL interventions promote asset development by enhancing five interrelated cognitive, affective, and behavioral competencies considered to be important for success in school and life: *self-awareness* (e.g., recognizing emotions, strengths and limitations, and values), *self-management* (e.g., regulating emotions and behaviors), *social awareness* (e.g., taking the perspective of and empathizing with others from diverse backgrounds and cultures), *relationship skills* (e.g., establishing and maintaining healthy relationships), and *responsible decision making* (e.g., making constructive choices across varied situations; Weissberg, Durlak, Domitrovich, & Gullotta, 2015).

Previous research has shown that the assets promoted within SEL interventions are associated with positive developmental trajectories. Specifically, longitudinal analyses have shown links between social and emotional competencies assessed in childhood and health, education, and well-being later in life (Hawkins, Kosterman, Catalano, Hill, & Abbott, 2008; Jones, Greenberg, & Crowley, 2015). There is also a substantial research base indicating that school-based SEL interventions have been effective in promoting targeted social and emotional competencies, which results in both enhanced social and academic adjustment and reduced levels of conduct problems and emotional distress (Durlak, Domitrovich, Weissberg, & Gullotta, 2015; Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011; Sklad, Diekstra, Ritter, Ben, & Gravesteijn, 2012). In other words, SEL interventions are a form of PYD asset development that focuses primarily on positive outcomes including school, career, and life success while also showing evidence of effective protection from negative outcomes (Bonell et al., 2016; Mendelez-Torres et al., 2016; Weissberg et al., 2015).

The social and emotional competency domains that are the defining focus of SEL intervention are conceptually aligned with many of the outcomes of interest within PYD's asset development objective. SEL interventions promote personal strengths in youth that overlap substantially with the PYD internal assets of social competencies, positive values, positive identity, and commitment to learning (Benson et al., 1998; Theokas et al., 2005). The five core SEL competency domains are also reflected in the 15 core PYD objectives identified in the previously mentioned review of PYD interventions, which include promoting social, emotional, behavioral, and cognitive competencies (Catalano et al., 2002). The close alignment between PYD and SEL has been emphasized recently in a review of the major theoretical frameworks for positive development (Tolan et al., 2016). The authors argue that the theoretical frameworks for PYD and SEL share substantial overlap and recommend a move toward integrating the approaches to advance the study and implementation of approaches that aim to enhance positive development in youth.

One of the important issues regarding PYD, in general, and SEL, in particular, involves examining how intervention affects youths' subsequent development. In their review of 46 meta-analyses and narrative reviews involving hundreds of studies and more than a half million students, Weare and Nind (2011) indicated that school-based universal promotion programs produced positive impact immediately following intervention but that the long-term effects of such interventions were in need of further study. In their review, Catalano et al. (2002) also pointed out that further research is needed to determine whether PYD interventions can sustain their initial positive findings.

The main purpose of this study was to fill this gap in research by conducting a meta-analysis of the follow-up effects of school-based universal SEL interventions. This research is an extension of a previous meta-analytic review of SEL programs that found significant positive effects at post on a range of outcomes (Durlak et al., 2011). The interventions included in this review vary considerably in duration, location, participants, and other features (Table 1), but they all collected follow-up assessments at 6 months or more postintervention. In addition, the current review aims to identify and

Table 1
Descriptives of 82 School-Based Universal Interventions With Follow-Up of at Least 6 Months

	N	%
General publication features		
Date of initial intervention report		
1981–1989	9	11.0
1990–1999	12	14.6
2000–2009	39	47.6
2010–2014	22	26.8
Source of report		
Published article/books	81	98.8
Unpublished dissertation	1	1.2
Methodological features		
Randomization		
Yes	52	63.4
No	28	34.1
Implementation		
Monitored without significant problems reported	50	61.0
Significant problems reported	15	18.3
Reliable outcome measures at follow-up (of 426)		
Yes	310	72.9
No/not reported	116	27.1
Valid outcome measures at follow-up (of 426)		
Yes	236	55.5
No/not reported	190	44.5
Source of outcome data at follow-up (of 426)		
Child	308	72.2
Other (parent, teacher, observer, school records)	118	27.8
Participant features		
Developmental level during intervention		
Childhood (age 5–10; grades K-5)[a]	31	37.8
Early adolescence (age 11–13; grades 6–8)	37	45.1
Adolescence (age 14–18; grades 9–12)	11	13.4
Race of participants		
Predominantly White	21	25.6
Predominantly students of color	14	17.1
No predominant race	19	23.2
Race not reported	28	34.1
Socioeconomic status of participants		
Predominantly low and working class	14	17.1
Predominantly upper and middle class	9	11.0
No predominant SES	28	34.1
SES not reported	31	37.8
Median total initial sample size	438	
Sample size sum across all interventions	97,406	
Mean total attrition at follow-up	17.7%	
Mean differential attrition at follow-up	1.1%	
Intervention features		
Intervention format		
Classroom by school personnel	32	39.0
Classroom by nonschool personnel	27	32.9
Multicomponent	23	28.0
Use of recommended training procedures		
Intervention rated as SAFE	73	89.0
Intervention not rated as SAFE	9	11.0
Number of sessions		
Mean number of sessions	20	
Median number of sessions	15	
Weeks until follow-up averaged at study level		
24 weeks to < 52 weeks (1 year)	50	61.0
52 weeks to < 104 weeks (2 years)	13	15.8
104 weeks to < 208 weeks (4 years)	11	13.4
208 weeks to 780 weeks (15 years)	6	7.3
Mean number of weeks-outcome level	115	
Median number of weeks-outcome level	52.0	
Locale of intervention		
United States	44	53.7
Outside the United States	38	46.3
General area of schools		
Urban	41	50.0
Suburban	8	9.8
Rural	9	11.0
Combination of areas	5	6.1

Note. The *N*s do not always add up to 82 due to missing data on some variables. SES = socioeconomic status; SAFE = sequenced, active, focused, and explicit. [a]Mostly middle childhood; only six in K-3rd grade.

test the specific theory of change that underlies SEL interventions. A recent theoretical review indicated that empirical data are needed to support the theory of change guiding PYD interventions and identify which assets provide the greatest support for positive outcomes and buffer against negative outcomes (Bonell et al., 2016). The current meta-analysis empirically tests one such theory of PYD articulated in the SEL framework: fostering social and emotional skills and positive attitudes provides students with assets that will promote well-being and protect against negative outcomes.

The theory of change behind the SEL approach is presented in Figure 1. SEL interventions focus on student-centered competence development. In some multicomponent approaches, an environmental focus enhances effectiveness by integrating SEL into school curriculum and practices or fostering climates that are safe, well-managed, caring, and participatory (Zins, Weissberg, Wang, & Walberg, 2004). As Figure 1 illustrates, the two primary social and emotional assets targeted by SEL interventions are social and emotional skills in the five competency domains and positive attitudes toward

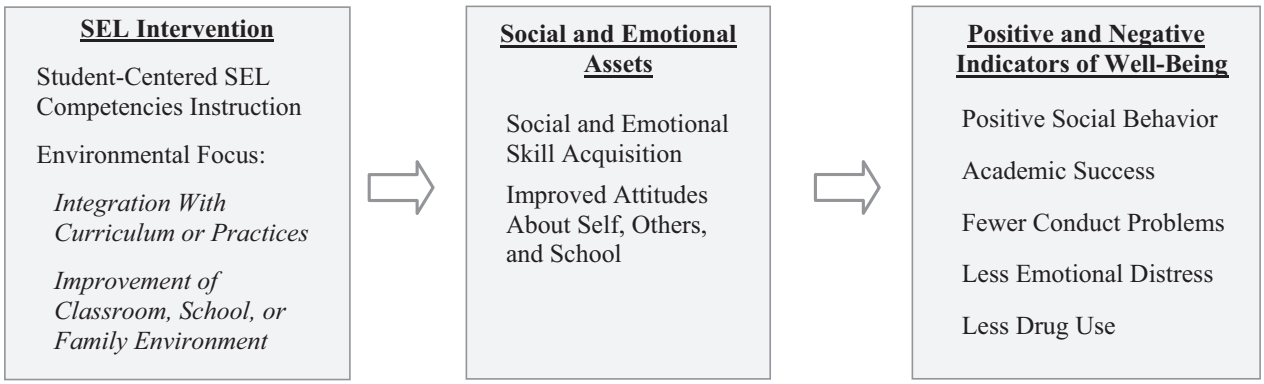

Figure 1. Social and emotional learning (SEL) framework for positive youth development, with SEL interventions fostering assets within youth, which promote the development of positive behavioral, academic, and mental health outcomes.

the self (e.g., more self-confidence), others (e.g., prosocial attitudes that disdain violence), and the school or education in general (e.g., feeling connected to teachers). The effective promotion of these *social and emotional assets* (i.e., enhanced skills and improved attitudes) is then expected to lead to better short- and long-term developmental outcomes that include more prosocial behavior, enhanced academic performance, fewer conduct problems, lower levels of emotional distress, and reduced substance abuse (Collaborative for Academic, Social, and Emotional Learning, 2013; Elias et al., 1997; Farrington et al., 2012; Zins et al., 2004). The current meta-analysis evaluates whether SEL interventions that encourage the development of *social and emotional assets* through school-based interventions yield significant effects at follow-up on multiple *positive and negative indicators of well-being*.

A final aim of the current review was to examine whether SEL interventions were effective in promoting positive developmental trajectories across diverse and global populations (Torrente, Alimchandani, & Aber, 2015). The assets promoted within SEL have the potential to enhance positive development for all youth, and the goal of universal school-based approaches is to reach all students rather than targeting specific subgroups. Positive benefits have been reported for SEL interventions conducted outside the United States and for students from various racial and socioeconomic backgrounds, although whether demographic subgroups of students benefit differentially from intervention is still unclear. The Promoting Alternative Thinking Strategies (PATHS) intervention found positive effects for both Black and White student participants (Conduct Problems Prevention Research Group, 1999). Some universal SEL intervention results indicate that students from ethnic minority groups or low socioeconomic status actually benefit more from intervention. Stronger intervention effects have been found for ethnic minority youth on the development of assets like emotional coping skills (Kraag, Van Breukelen, Kok, & Hosman, 2009) and for students from poor families on school attachment and achievement (Hawkins, Catalano, Kosterman, Abbott, & Hill, 1999). However, there is also empirical evidence that some universal SEL programs have been less effective in promoting social competence within high-poverty schools (Conduct Problems Prevention Research Group, 2010) or boosting optimism to reduce depression for African American youth (Miranda et al., 2005). The current meta-analytic review allows us to undertake a quantitative, systematic examination of whether SEL is an effective strategy within and outside the United States and with students from diverse racial and socioeconomic backgrounds.

We had three main hypotheses. First, we predicted that significant effects for outcomes assessed at follow-up periods of 6 months or longer would significantly favor SEL program participants over controls in seven distinct outcome categories, which cover both the social and emotional assets that are the focus of SEL intervention as well as several positive and negative indicators of well-being. Second, we predicted that SEL interventions would be an effective PYD approach with diverse racial and socioeconomic populations. That is, we expected to find similar positive effects for interventions conducted within and outside of the United States; for student participants who were predominantly White, predominantly students of color, or racially diverse; and, finally, for students from low- or working-class and from upper- or middle-class families. Third, based on the SEL framework, we tested the relative benefits of enhancing social and emotional

skills and positive attitudes at postintervention on positive and negative indicators of well-being at follow-up. Based on the accumulating empirical evidence base in SEL and PYD, we predicted that social and emotional asset development at post would predict positive long-term outcomes at follow-up.

In addition, follow-up studies conducted over a long-time period afford the opportunity to examine important indices of development that may not be relevant or available for immediate postassessments or that may not be collected frequently enough across studies to be amenable to formal meta-analysis. For example, does intervention in the early elementary years lead to higher rates of high school graduation or college attendance, to stronger social relationships, or to a reduction in serious social or mental health problems later in life? Based on our knowledge of the literature we knew some researchers had collected these less frequently reported but important outcomes, and we summarize these findings to present a more complete picture of how participation in SEL programs has affected some critical subsequent developmental outcomes.

Method

The overview of methods provided below is greatly expanded upon in Supporting Information, including more detailed descriptions of the literature search, inclusionary criteria, coding procedures, and variables analyzed.

Study Sample

We used procedures similar to an earlier meta-analysis to search for, select, and code studies (Durlak et al., 2011). Reports had to describe a school-based universal SEL program for kindergarten to 12th-grade students that collected follow-up data from intervention and control groups 6 months or more postintervention, contained sufficient data to calculate an effect size (ES) on at least one outcome, and appeared by December 2014. Eighty-two interventions constituted the final sample; although our search covered all types of reports, all but one of the qualifying interventions came from a published report. Descriptive information on the 82 interventions involving a total of 97,406 students is shown in Table 1. A majority of studies used randomized designs, monitored implementation, and used reliable and valid outcome measures.

The SEL interventions varied in general procedures, which of the core SEL competencies were targeted, and what outcomes were used to assess program impact. In terms of procedures, the programs were most often classroom-based interventions; the majority of these sought to promote competencies through a series of structured group lessons lasting between 30 and 45 min. A few incorporated the development of competencies as part of regular academic instruction, and a minority also expanded the classroom intervention with additional components such as efforts to enhance classroom or school climate, various school-wide initiatives, or parent involvement. Several of the reviewed programs (e.g., PATHS, Positive Action, Life Skills) have achieved recognition as effective interventions by various organizations and agencies. Each included program had to target at least one of the five SEL competency domains (e.g., self-management, relationship skills) to be included, and some focused on all five. Eighty-nine percent of the interventions were rated as having sequenced, active, focused, and explicit (SAFE) practices (Durlak et al., 2011).

The sample included kindergarten through high school students, with 37.8% in kindergarten to 5th grade, 45.1% in 6th to 8th grade, and 13.4% in 9th to 12th grade. Students represented ethnically, socioeconomically, and regionally diverse samples. Forty-four of the intervention studies were conducted within and 38 outside of the United States. Forty-one interventions occurred in urban school districts, eight in suburban school districts, nine in rural settings, and five were in a combination of these locations.

Socioeconomic Characteristics

Only 51 of the 82 interventions reported any information on socioeconomic status (SES); only 26 of those provided an actual percentage of students from low SES households ($M = 41.1$, $SD = 33.8$). In order to create comparison groups for meta-analysis, we identified interventions where 75% or more of the students were of a specified SES status as being "predominantly" of that group and thus roughly representative of SEL intervention impact on that demographic. Fourteen of the interventions included children predominantly (i.e., at least 75%) from poverty level and working-class families, and those interventions served as our lower income comparison group. Nine studies included children predominantly from middle- and upper-class families, and in an additional 28 studies, the student sample was a socioeconomically mixed group with no predominant SES.

Participant Race

Only 54 studies reported any information on race; of those, 46 studies provided enough data to calculate the percentage of students of color (i.e., non-White students; $M = 45.85$, $SD = 35.53$). Similar to the procedure for SES, we also identified interventions where 75% or more of the students were of a specified racial background. Twenty-one studies had a predominately White student sample and 14 studies involved predominantly students of color, with seven of the latter having a predominately Black student population. An additional 19 studies involved racially diverse student samples that were not predominantly of any group.

Dependent Variables

The outcomes of interest from the interventions were limited to those measures that reported changes in students. Effects on caregivers or teachers were not included in the analyses. Outcomes were sorted into seven distinct categories assessing positive social and emotional assets (*social and emotional skills; attitudes toward self, others, and school)* and positive (*positive social behaviors; academic performance)* and negative *(conduct problems; emotional distress; substance use)* indicators of well-being.

Social and emotional skills. This outcome consisted of such skills as identifying emotions, perspective taking, self-control, interpersonal problem solving, conflict resolution and coping strategies, and decision making, depending on the specific targets and developmental levels of the participating samples. All these outcomes were measured in a hypothetical situation or using structured tasks or questionnaires (e.g., feeling word questionnaires, conflict resolution role plays, or interviews). Any reports of general behaviors or observations of students' skills occurring during daily situations were instead placed in the positive social behavior category.

Attitudes toward self, others, and school. This outcome assessed students' attitudes about the self, others, and school. Self-perceptions included measures of self-esteem, self-efficacy, or self-concept. Attitudes about others reflected prosocial beliefs such as disapproval of substance abuse and violent behavior or endorsements related to understanding and helping others. Finally, attitudes related to school included both beliefs about the teacher, learning, or education in general as well as school bonding, connectedness, or belonging. All the attitude outcomes came from student self-reports.

Positive social behavior. Positive behaviors included measures that represent the use of social skills in naturalistic settings. This category reflects prosocial behaviors outside of the practice context of the intervention typically measured by teacher or students reports (e.g., cooperation, use of problem-solving skills, or efforts to help others).

Academic performance. This category included data from school records of either grades or achievement test scores. Students' self-reports of their academic performance were not included.

Conduct problems. This outcome included reports of problem behaviors, such as violence, aggression, bullying, classroom disruption, or noncompliance. Disciplinary referrals or suspensions were also included in this category as indications of these behaviors. These measures of externalizing behaviors could either be self-reported or observed by others, but all data on referrals or suspensions came directly from official school records.

Emotional distress. This category included primarily symptoms of internalizing difficulties, such as depression, anxiety, and stress, which were typically based on student reports.

Substance use. All measures of initiation, use, and misuse of intoxicating substances, including both legal and illegal drugs, were included in this outcome category. Only self-reports of drug use were included. Intentions, attitudes, or perceptions of drug use were not included.

Additional outcomes. Finally, a few studies examined important developmental outcomes that did not fit into the above seven outcome categories. These include positive variables, such as high school graduation, income/employment, relationships, and safe sexual behaviors, and negative outcomes, such as mental health problems and arrests. These data were too infrequent to include in the meta-analyses but are presented separately as additional measures of program impacts.

ES Calculations

For each outcome, an ES was calculated as Hedge's g (Hedges & Olkin, 1985). If results for an outcome were only reported as "nonsignificant" (6.6% of the 361 follow-up outcomes), the ES was set to zero. Whenever pre-intervention differences between the control and intervention groups were reported for an outcome, both post and follow-up ES were adjusted by subtracting the pre-ES from the post or follow-up effect. ESs were calculated so that positive values indicated a more beneficial outcome favoring the intervention group over the controls.

Prior to any analyses, outlier values for follow-up ESs, post-ESs, and sample sizes for control and experimental groups within each outcome category were winsorized according to common meta-analytic practices (Lipsey & Wilson, 2001). This process recodes extreme outliers to a more normally distributed value instead of removing them altogether, which prevents any individual study with large ES from having an undue influence on the analyses. All outliers were winsorized to a value representing 3 *SD* of the mean ES of their respective outcome category with the outliers removed. In all analyses, ESs were also weighted by their inverse variance to give a greater weight to studies with larger sample sizes.

For each analysis, ESs were aggregated based on the dependent variable of interest, so that each intervention contributed only one ES per outcome. Thus, when multiple outcomes from the same outcome category were assessed within a single study, these outcomes were averaged to obtain a single ES.

All of the meta-analyses used a random effects model with a maximum likelihood estimation procedure to arrive at ES and 95% confidence intervals (Lipsey & Wilson, 2001). A mean ES is considered significantly different from zero at $p < .05$ when its confidence intervals do not include zero. When conducting group comparisons within a meta-analytic analysis of variance, the weighted mean ES and 95% confidence intervals are calculated for each group, and those ES are considered to be significantly different from each other if their confidence intervals do not overlap.

General Analytic Procedures

Our first set of analyses evaluated the mean ESs at follow-up for each of the seven outcome categories to test our hypothesis that all of the social and emotional assets and positive and negative indicators of well-being would be significant. Our second set of analyses tested our second hypothesis regarding the effectiveness of SEL interventions across diverse global, racial, and socioeconomic groups using meta-analytic analyses of variance. Finally, we tested the contribution of postintervention assets in predicting students' follow-up outcomes. These analyses employed a series of meta-regressions as explained below.

Results

Effects of SEL Interventions at Follow-Up

As shown in Table 2, the hypothesized statistically significant positive effects of SEL interventions were found at follow-up for each of the seven outcome categories. Mean ESs ranged from .13 to .33, with SEL program participants benefiting significantly more than controls across all of the social and emotional assets and positive and negative indicators of well-being. The mean follow-up period varied from 56 to 195 weeks depending on the particular outcome category.

The possible impact of publication bias on these effects was examined using trim-and-fill analyses for each of the seven outcome categories. Following procedures described by Duval and Tweedie (2000), we first identified and "trimmed" the studies with smaller sample sizes and larger significant ES until a symmetrical funnel plot stabilized. The number of trimmed studies is an estimate of the missing studies for each outcome, which ranged from 3 to 14. ES values for the missing studies were estimated and "filled" into the funnel plot by mirroring the trimmed effects around the center. These trimmed and filled ES were added into the analyses to create an adjusted estimate of mean ES in each category. Effects in every category remained significant after including these adjustments for possible publication bias. Complete details can be found in Supporting Information.

Although the effects at postintervention were not of primary interest in this meta-analytic review, they provided a baseline context and were used in the prediction of follow-up effects. For the 82 studies, measures of social and emotional assets at post showed significant positive impacts of the intervention, with participants having stronger SEL skills (n = 36, ES = .17, 95% CI [.11, .24]) and improved attitudes (n = 25, ES = .17, 95% CI [.09, .24]) compared with controls. Program participants also faired significantly better than controls at post on academic performance (n = 8, ES = .22, 95% CI [.07, .36]), emotional distress (n = 38, ES = .12, 95% CI [.06, .19]), and drug use (n = 21, ES = .12, 95% CI [.04, .19]). However, postintervention mean ESs were not significant for either positive social behaviors (n = 28, ES = .06, 95% CI [−.01, .13]) or conduct problems (n = 30, ES = .07, 95% CI [.00, .14]). Greater details on the postintervention analyses can be found in Supporting Information.

Effects of SEL Interventions With Diverse Populations

In order to examine the effectiveness of SEL interventions across demographic groups, it was necessary to collapse the outcome categories into a single intervention level ES to obtain sufficient

Table 2
Mean Effect, Confidence Intervals, Follow-Up Periods, and Improvement Indices for Total Sample

	Follow-up ES by outcome category						
	Social and emotional assets		Positive and negative indicators of well-being				
	SEL skills	Attitudes	Positive social behavior	Academic performance	Conduct problems	Emotional distress	Drug use
ES	.23[a]	.13[a]	.13[a]	.33[a]	.14[a]	.16[a]	.16[a]
95% CI	.15, .31	.05, .21	.05, .21	.17, .49	.07, .21	.08, .23	.09, .24
N	29	26	28	8	34	35	28
Mean follow-up (weeks)	56	103	89	195	113	88	139
Improvement index, %	9.09	5.17	5.17	12.93	5.56	5.64	5.64

Note. ES = effect size; SEL = social and emotional learning. [a]Mean effect is significantly different from zero at the .05 level.

sample sizes. Significant positive effects for SEL program participants were found at follow-up across all demographic subgroups. That is, there was no significant difference in the impact of SEL at 6 months or more postintervention between interventions involving predominately White students (n = 21, ES = .23, 95% CI [.14, .32]), predominately students of color (n = 13, ES = .18, 95% CI [.06, .30]), or interventions containing a diverse student population (n = 19, ES = .17, 95% CI [.08, .27]). There was also no significant difference in follow-up ES between interventions involving predominately low- and working-class students (n = 13, ES = .21, 95% CI [.08, .33]) compared with those of another SES status (i.e., either predominately middle and upper class or diverse SES samples; n = 36, ES = .23, 95% CI [.15, .30]). Finally, a comparison of follow-up effects for interventions conducted in the United States (n = 43, ES = .20, 95% CI [.14, .26]) and abroad (n = 38, ES = .16, 95% CI [.09, .22]) revealed comparable positive effects in both contexts.

What Predicts Follow-Up Effects?

Before examining whether skills, attitudes, or both predicted follow-up effects, we conducted meta-regressions to examine the possible influence of 21 alternative predictors on the combined mean ES across all outcomes. The alternative predictors included methodological variables (i.e., randomization, validity of outcome measures, reliability of outcome measures, source of outcome data, quality of implementation, length of follow-up, total attrition, and relative attrition), features of the intervention (i.e., SAFE practices, intervention format, duration, number of sessions, and tailored content), and characteristics of the participants (i.e., average age, developmental level, percentage of White students, percentage of Black students, percentage female, total sample size, school community location, and domestic or international population). Only significant findings for these alternative predictors are reported here; complete information about these variables and the analyses are in Supporting Information.

Two variables emerged as significant predictors. Higher total sample attrition at follow-up was associated with lower ES ($B = -.30$; $\beta = -.24$, $p < .05$). Participant age was also significant and negatively related to follow-up ES ($B = -.02$; $\beta = -.21$, $p < .05$). We examined the age finding further by dividing age into three developmental levels. The 31 interventions with student participants in childhood (ages 5–10) had the largest follow-up effects (ES = .27, 95% CI = [.19, .34]); their effects at follow-up were significantly higher than the 37 interventions with early adolescent students (ages 11–13; ES = .12, 95% CI = [.06, .18]). Only 11 interventions focused on adolescent populations (ages 14–18), and these students did not differ significantly at follow-up from either of the other age groups (ES = .18, 95% CI = [.05, .31]).

In order to create sufficient sample size for the meta-regression analyses predicting follow-up effects, it was necessary to average the ESs across two positive (i.e., prosocial behaviors and academic performance) and three negative (i.e., conduct problems, emotional distress, and drug use) indicators of well-being to produce a single dependent outcome variable indicative of follow-up effects. This composite mean effect for these five outcomes was also significant at follow-up (ES = .18, 95% CI = [.13, .23]).

First, to explore the relative influence of attrition and age, a meta-regression was conducted with both predictors of the indicators of well-being added simultaneously. With their shared variance removed, age was no longer a significant predictor ($B = -.01$; $\beta = -.11$, *ns*), but total attrition remained significant ($B = -.36$; $\beta = -.32$, $p < .01$). Next, we conducted a hierarchical meta-regression to test the hypothesized relationship between postintervention ES for social and emotional assets and the mean follow-up ES for positive and negative indicators of well-being. Hierarchical regression was used to demonstrate the strength of the relationship between postintervention assets and follow-up well-being after controlling for any variance explained by attrition. Attrition was entered alone as a control into the first block of a hierarchical meta-regression, and it explained 9% of the variance ($R^2 = .09$, $B = -.37$; $\beta = -.32$, $p < .01$). The combined postintervention ES for assets was added in the second block. As we predicted, a significant relationship between assets at post and indicators of well-being at follow-up (R^2 change $= .15$; $B = .29$; $\beta = .35$, $p < .01$) was found in the 42 studies with relevant data for all variables. Higher levels of social and emotional assets at post were associated with higher levels of well-being at follow-up, predicting an additional 15% of the variance after controlling for attrition.

Finally, to examine possible differences in the predictive power of skills versus attitudes, hierarchical meta-regressions were run again with the postintervention ES for either social-emotional skills or attitudes entered separately in the second block. Social-emotional skills had a significant positive relationship (R^2 change $= .16$; $B = .33$; $\beta = .39$, $p < .01$; $n = 31$), such that better skills at postintervention predicted higher follow-up effects on positive and negative indicators of well-being, predicting an additional 16% of the variance after controlling for attrition. For the interventions measuring attitudes at postintervention, however, the relationship was not significant (R^2 change $= .05$; $B = .19$; $\beta = .24$, *ns*; $n = 20$).

Additional Follow-Up Outcomes

Table 3 presents data on several additional and critical developmental outcomes assessed by some investigators at various follow-up periods. Twenty-three of the 29 ES in Table 3 are positive. Only four are zero and two are negative in sign favoring the control group. In most cases, investigators have reported positive results for outcomes such as positive relationships with peers and family, school attendance, safe sexual behaviors, graduation rates, college attendance, arrests, and various indices of mental health adjustment. To reflect their practical importance, we have translated the ES for the *dichotomous* outcomes in Table 3 in two ways. First, we used the Binomial Effect Size Display (Rosenthal & Rubin, 1982) to indicate how the obtained ES reflects the percentage differences between the intervention and control groups. For example, the ES of .12 and .22 reported, respectively, on high school and college graduation at long-term follow-up (Bradshaw, Zmuda, Kellam, & Ialongo, 2009; Hawkins et al., 2008) reflects 6% more students succeeding in high school, and 11% more students completing college among the intervention group compared with the controls. The ES of .37 reported by Eddy, Reid, Stoolmiller, and Fetrow (2003) at a 120-week follow-up reflects 18.5% fewer arrests among the intervention group compared with the controls, and the effect of .12 for placement in special education (Bradshaw et al., 2009) indicates 6% fewer placements for the intervention group.

In addition, we have applied the findings of several authors who have conducted cost analyses to calculate the *lifetime monetary benefit or cost per event* of achieving certain outcomes (Carnevale, Rose, & Cheah, 2011; Chambers, Parrish, & Harr, 2004; Chesson, Blanford, Gift, Tao, & Irwin, 2004; Cohen, Piquero, & Jennings, 2010). When they can be calculated, the figures for these outcomes are listed in the last column of Table 3, and they have been updated to 2015 U.S. dollars. For example, the estimated benefit in lifetime earnings for graduating from high school compared to dropping out is worth over $367,000 *to each graduating student. Each* teenage pregnancy costs nearly $150,000, and the savings in reducing arrest and delinquency rates are also considerable. Reducing the incidence of drug abuse and conduct disorder by one person can potentially save between one to nearly four million dollars. Although only a minority of the studies in this review is represented in Table 3, the results add support for the ability of some SEL programs to influence critical developmental outcomes during follow-up.

Discussion

There are five important findings from the current review. The first involves the durability of impacts from PYD programs. Students in school-based SEL interventions continued to demonstrate significant,

Table 3
Additional Follow-Up Outcomes

Outcome category	Report	Outcome	Follow-up period (in weeks)	ES	% Advantage for intervention group	Lifetime monetary benefit or cost saving per event
Relationships	Harnett and Dadds (2004)	Family cohesion	144	.19		
	Gesten et al. (1982)	Peer acceptance	52	.29		
	Sawyer et al. (1997)	Peer relationships	52	.11		
School status	Sarason and Sarason (1981)	Attendance	52	.47		
	Elias, Gara, Schuyler, Branden-Muller, and Sayette (1991)[a]	Attendance	312	0		
	Elias et al. (1991)[a]	Attendance	312	.44		
	Gottfredson, Jones, and Gore (2002)	Attendance	26	−.28		
	Bradshaw et al. (2009)	Placement in special education class	572	.12	6	$93,781
	Hawkins et al. (1999)	Repeating a grade	312	.23	12.5	
	Felner et al. (1993)	High school dropout	156	.51	25.5	
	Hawkins et al. (2008)	High school dropout	780	.15	7.5	
	Bradshaw et al. (2009)	High school graduate	572	.12	6	$367,687[b]
	Bradshaw et al. (2009)	College attendance	624	.21	10.5	$637,621[b]
	Hawkins et al. (2008)	College degree (Assoc or BA)	780	.22	11	$1,138,054[b]
Sexuality	Harrington, Giles, Hoyle, Feeney, and Yungbluth (2001)[a]	Safe sexual behaviors	52	0		
	Harrington et al. (2001)[a]	Safe sexual behaviors	52	0		
	Hawkins et al. (2008)	Safe sexual behavior	780	0		
	Hill et al. (2014)	STD diagnosis	936	.76	38.5	$9,940
	Hawkins et al. (2008)	Pregnancy and births	780	.13	6.5	$147,351
Income/ employment	Hawkins et al. (2008)	Income	780	.06		
	Hawkins et al. (2008)	Socioeconomic status	780	.22		
Criminality	Cook and Hirschfield (2008)	Juvenile justice involvement	208	.12	6	$240,221
	Eddy et al. (2003)	Arrests	120	.37	18.5	$175,702
	Hawkins et al. (2008)	Arrests	780	−.04	−2	
Mental health	Ialongo, Poduska, Werthamer, and Kellam (2001)	Ever used mental health services	260	.18	9	
	Ialongo et al. (2001)	Diagnosis of conduct disorder	260	.2	10	$3,950,000
	Riggs and Pentz (2009)	Adult mental health services use	728	.13	6.5	
	Hawkins et al. (2008)	Clinical disorder	780	.27	13.5	
	Hawkins et al. (2008)	Substance abuse diagnosis	780	.03	1.5	$1,051,688

Note. Monetary benefits or costs could not be estimated for all outcomes. ES = effect size. [a]For Elias et al. (1991) and Harrington et al. (2001), the articles each contributed two unique interventions to the meta-analysis, resulting in the report of two effect sizes in the outcome category, one for intervention A and one for intervention B. [b]This is the incremental value in lifetime earnings of continuing education compared to not finishing high school.

positive benefits in seven outcomes collected, on average, from 56 weeks and up to 195 weeks (i.e., 3.75 years) following program participation. These results are impressive; although at first glance, the follow-up mean ES may seem quite modest. However, Cohen's (1988) suggestions for judging the magnitude of effects as small (.20), medium (.50), or large (.80) are not applicable for universal promotion or prevention studies nor are they relevant for interpreting follow-up data. For example, the mean effect of .33 on academic performance (based on grades and test scores drawn from school records,

obtained at a mean follow-up period of 195 weeks) compares favorably to the post effects obtained by many educational interventions (Hill, Bloom, Black, & Lipsey, 2008). Although based on only eight studies, these long-term academic outcomes are notable. For the other outcomes, there are no current empirical standards for judging the magnitude of follow-up effects for interventions designed to promote youth development. Thus, current data are new to the fields of SEL and PYD. Therefore, the mean effects reported here may serve as initial benchmarks that other researchers can use to compare the success of their efforts.

A second important finding involves the dual benefits of SEL interventions in terms of affecting both positive and negative indicators of well-being. The main purpose of PYD is to set young people on a positive developmental trajectory so that they are prepared to fully realize their potential and are resilient to the challenges they may face. By fostering social and emotional skills and positive attitudes in students, the school-based, universal SEL interventions reviewed in this study achieved these ends during follow-up in terms of significantly improving skills, positive attitudes, prosocial behavior, and academic performance. These programs were also able to serve as a protective factor against the development of subsequent problems (i.e., conduct problems, emotional distress, and drug use). In other words, the enhancement of asset development through PYD approaches like SEL can have both promotion and preventive impact (National Research Council and Institute of Medicine, 2009).

Third, the SEL approach to PYD was beneficial for all demographic groups that we were able to examine in this review. Consistent positive effects at follow-up were found for SEL interventions with student populations from different racial groups and socioeconomic statuses, and for both domestic and international student bodies. This finding is in alignment with the conceptual perspective that the social and emotional assets promoted in SEL can support the positive development of students from diverse family backgrounds and geographic contexts (Greenberg et al., 2003). However, although we did not find differential effects among groups, this should not be interpreted as an endorsement that "one size fits all" when it comes to SEL intervention. It is critical that program developers and researchers examine strategies to design and implement interventions in culturally competent ways (Hecht & Shin, 2015; Hoffman, 2009).

The fourth important finding concerns the positive relationship between stronger social and emotional assets at post and higher levels of well-being at follow-up. Our meta-regressions support the conceptual model of SEL in which the targeting of various social and emotional assets will be associated with significant improvement in students' long-term adjustment (Durlak et al., 2015). When we examined the differential associations of social-emotional skills and positive attitudes, we found that enhanced skills, rather than attitudes, predicted long-term follow-up effects. The impact of skills in our analysis is consistent with the growing literature documenting that improving children's intrapersonal and interpersonal competencies—such as self-regulation, problem solving, and relationship skills—enhances children's academic performance and behavior (Domitrovich, Staley, Durlak, & Weissberg, 2016; Sorensen, Dodge, & Conduct Problems Prevention Research Group, 2015). In addition, the finding that attitudes achieved at post were not a significant predictor of follow-up effects bears further consideration. The result could be seen to offer empirical support to an extensive research base in the promotion and prevention literature emphasizing the particular importance of skill training (i.e., competency enhancement) in improving the adjustment of youth (e.g., Durlak, 2014; Wilson & Lipsey, 2007). Alternatively, because attitude outcomes varied considerably among the studies assessed in the model, it is possible that some attitudes are effective predictors of later well-being, but their impact is washed out when combined with other less impactful attitudes. Recent reviews point to the potential of enhancing personal and social attitudes to improve academic performance and behavior (e.g., Farrington et al., 2012; Yeager & Walton, 2011). Identifying which attitudes might be effective for enhancing later well-being and how to better coordinate SEL programming that fosters improved skills, attitudes, and behavioral functioning are important priorities for future research.

A fifth and final set of findings involve the positive effects on several additional important developmental outcomes, collected up to 936 weeks (i.e., 18 years) postintervention, which were reported in a subsample of studies. For example, improving future social relationships, increasing high school graduation rates and college attendance, and reducing later negative outcomes such as arrests or the presence of clinical disorders are notable achievements. These are the type of outcomes for which seemingly small ESs can nevertheless reflect practical advantages for the intervention. For example, based on an ES of "only" .12, most educators would welcome an intervention that could reduce

special education placements or increase high school graduation rates by 6%. The outcomes noted in Table 3 are not only indices of positive developmental trajectories for program participants that appear at follow-up, but they are also evidence of how much both participating students and society can profit from the sometimes substantial monetary benefits and cost savings that can be achieved by SEL programs. These findings build on a recent study examining the economic value of six SEL interventions that found for every dollar invested there was a return of 11 dollars (Belfield et al., 2015). Only a small group of the 82 interventions collected data on these later critical developmental outcomes, and we encourage other investigators to include such outcomes in their follow-up studies.

Limitations and Some Future Research Directions

Six limitations suggest directions for future research. First, it is noteworthy that most interventions in this meta-analysis incorporated the following four SAFE program features that have been suggested as best practices for SEL intervention (Durlak et al., 2011): *Sequenced*: The program had a coordinated progression of activities or practices to build competencies; *Active*: Participatory elements such as role plays involved students in active learning of SEL competencies; *Focused*: There was a dedicated time or specific program element that was focused on developing SEL competencies; and *Explicit*: The program identified specific SEL competencies that it was trying to develop within the intervention. Due to the low incidence of programs that did not meet the SAFE criteria ($n = 9$), it was not possible to evaluate whether non-SAFE SEL programming also might lead to improved long-term adjustment.

Second, in the examination of alternative predictors and within our meta-regressions, we had to combine all follow-up outcomes into a single dependent variable to establish sufficient cell sizes for the analyses. Therefore, we could not assess which variables were significant predictors of each separate indicator of positive or negative well-being. Furthermore, not all reports contained assessments of either social and emotional skills or attitudes at postintervention, which limited our predictive power in the regression analyses. This is a particular oversight given that all interventions included in this study targeted competency building in at least one of the five SEL core competency areas. Future research should consistently assess these social and emotional assets, so that mediators of SEL interventions on key positive developmental outcomes can be more rigorously evaluated.

Third, almost three quarters of the studies (i.e., 72.2%) relied on self-report measures to evaluate student outcomes. Two of the outcome categories, prosocial attitudes and drug use, were intentionally limited to self-report measures. However, although it is important to include young people's perspectives regarding their skills, attitudes, and behaviors, future research should also incorporate additional measures from the perspectives of others (e.g., teachers, parents, observers) and public record data (e.g., graduation rates, employment, income). Examining these kinds of follow-up data (Table 3) can provide a foundation for a more rigorous exploration of the return on investment of SEL programming.

Fourth, the alternative predictors examined in this meta-analysis do not allow us to draw conclusions about what specific features make SEL interventions more or less effective. Aside from postintervention social and emotional skills, only attrition was a significant predictor in the hierarchical regression analysis. Attrition can be a challenge in longitudinal studies because it is logical to assume that more participants may be lost as the time span lengthens, so researchers should evaluate how this possibility may affect outcomes. In addition, we encourage future research to also examine how environmental supports (e.g., parenting, teacher instructional practices) influence long-term outcomes (Weissberg et al., 2015). Greater attention to the environmental enhancement components of SEL intervention would allow a more complete understanding of how PYD trajectories are fostered within these interventions. However, studying those variables was beyond to scope of the current meta-analysis.

Fifth, although age was significantly negatively related to follow-up effects when examined as an individual predictor, we urge caution in interpreting the finding as an indication that SEL intervention is more appropriately targeted in childhood than early adolescence. For one, the effect of age was reduced to nonsignificance when both attrition and age were entered together into the first step of the regression predicting indicators of well-being. In addition, age has significant covariates in this sample that could be considered as alternative explanations. For example, the average intervention duration is significantly negatively correlated with participant age ($r = -.34$, $p < .01$) so that interventions targeted at younger children were also delivered over a longer period of time.

Sixth, although we found consistent positive effects for SEL interventions with students from diverse racial and socioeconomic demographics, these analyses were limited by the lack of data in many studies. More than 40% (34 of 82) of the studies did not report any specific percentages of student ethnicity, and only a third (26 of 82) reported the percentage of students in poverty. It is critical in future research to assess if students from diverse socioeconomic and racial and ethnic groups respond differently to interventions on a variety of outcomes. To do so, authors must provide complete demographic data on program participants, and conduct and report subgroup analyses whenever possible.

Concluding Comments

School-based SEL represents an important set of approaches to promote the positive academic growth, behavior, and development of youth (Durlak et al., 2011, 2015; Sklad et al., 2012). Building on the short-term benefits that hundreds of studies have documented, this review provides evidence for long-term positive effects that school-based SEL programs can foster across diverse geographic contexts and age groups. Findings also add to the growing literature on the potential economic and societal return on investment for SEL programming (Belfield et al., 2015). It is noteworthy that these findings lend empirical support to the opinions of a large majority of teachers in the United States, who indicated in a recent national survey that they believe that (a) students from all types of backgrounds, both poor and wealthy, would benefit from SEL in school; (b) SEL programming can prepare students to move successfully through school and college, and to be productive workers and good citizens; and (c) they (teachers) should play a key role in promoting the positive social, emotional, and academic growth of students (Bridgeland, Bruce, & Hariharan, 2013). However, for school-based SEL to be an effective approach to fostering PYD, educators need support to implement and appropriately adapt interventions such as those in the current meta-analysis. Without quality implementation, the potential positive impact of SEL programming is reduced (Durlak et al., 2011). With the support of sound federal and state policies, district and school leaders, quality professional preparation, and ongoing, embedded professional learning, it will be possible to enhance the positive development of many more students through SEL.

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Supporting Information

Additional supporting information may be found in the online version of this article at the publisher's website:

Data S1. Expanded Methods, Supplementary Results, and References for Reviewed Interventions