

Promoting Alternative THinking Strategies (PATHS®)

Intervention Report | Supportive Learning Environment Topic Area

WHAT WORKS CLEARINGHOUSE™

March 2021

NCEE 2021-008
U.S. DEPARTMENT OF EDUCATION

A Publication of the National Center for Education Evaluation at IES

A supportive learning environment is one that is safe, includes effective and fair use of appropriate discipline practices, and promotes positive student outcomes and teacher practice. The *Promoting Alternative THinking Strategies (PATHS®)* program is a curriculum that aims to promote emotional and social competencies and to reduce aggression and behavior problems in elementary school children. *PATHS®* is delivered through short lessons given two to three times a week over the school year. The program is based on the principle that understanding and regulating emotions are central to effective problem solving. The lessons focus on (1) self-control, (2) emotional literacy, (3) social competence, (4) positive peer relations, and (5) interpersonal problem-solving skills. There is a separate curriculum for each grade.¹

This What Works Clearinghouse (WWC) intervention report, part of the WWC’s Supportive Learning Environment topic area, explores the effects of the *PATHS®* program on student emotional awareness, social interactions, behavior, and academic achievement. The WWC identified 35 studies of the *PATHS®* program. Two of these studies meet WWC standards. The evidence presented in this report is from studies of the effects of the *PATHS®* program on students—including 70% White, 11% Asian, and 8% Black students, and students with and without disabilities—spanning grades 1 through 5 in both urban and suburban districts.

What Happens When Students Participate in the *PATHS®* program?²

The evidence indicates that implementing the *PATHS®* program has no discernible effects on students’ academic achievement, social interactions, observed individual behavior, or emotional status.

Findings on the *PATHS®* program from two studies that meet WWC standards are shown in Table 1. The table reports an effectiveness rating, an improvement index, and the number of studies and students that contributed to the findings. The effectiveness rating is based on the quality of the designs used in studies, whether the findings are favorable or unfavorable for the intervention, and the number of studies that tested the intervention. See Box 1 for more information on interpreting effectiveness ratings.

In order to help readers judge the practical importance of an intervention’s effect, the WWC translates findings across

studies into an “improvement index” by averaging findings that meet WWC standards within the same outcome domain. The improvement index can be interpreted as the expected change in percentile rank for an average comparison group student if that student had received the intervention. For example, an improvement index of -3 means that the expected percentile rank of the average comparison group student would decrease by 3 points if the student received the *PATHS®* program. A positive or negative improvement index does not necessarily mean the estimated effect is statistically significant. Results for each individual outcome measure within domains are shown in Table 4.

The evidence presented in this report is based on available research. Findings and conclusions could change as new research becomes available.

Table 1. Summary of findings on the *PATHS®* program from studies that meet WWC standards

Outcome domain	Effectiveness rating	Study Findings	Evidence meeting WWC standards (version 4.0)	
		Improvement index (percentile points)	Number of studies	Number of students
Academic achievement	No discernible effects	-3	1	1,582
Student social interaction	No discernible effects	na	1	133
Observed individual behavior	No discernible effects	na	1	113
Student emotional status	No discernible effects	na	1	133

Note: For more information about outcome measures, see study descriptions in Tables 6 and 8. The effects of the *PATHS®* program are not known for other outcomes within the Supportive Learning Environment topic area, including general educator discipline practice, educator instructional practice, school climate, student engagement in school, and school equity. na = not available.

BOX 1. HOW THE WWC REVIEWS AND DESCRIBES EVIDENCE

The WWC evaluates evidence based on the quality and results of reviewed studies. The criteria the WWC uses for evaluating evidence are defined in the [Procedures and Standards Handbooks](#) and the [Review Protocols](#). The studies summarized in this report were reviewed under WWC Standards (version 4.0) and the Supportive Learning Environment topic area protocol (version 4.0).

To determine the effectiveness rating, the WWC considers what methods each study used, the direction of the effects, and the number of studies that tested the intervention. The higher the effectiveness rating, the more certain the WWC is about the reported results and about what will happen if the same intervention is implemented again. The following key explains the relationship between effectiveness ratings and the statements used in this report:

Effectiveness Rating	Rating interpretation	Description of the evidence
Positive (or negative) effects	The intervention is <i>likely</i> to change an outcome	Strong evidence of a positive (or negative) effect, with no overriding contrary evidence
Potentially positive (or negative) effects	The intervention <i>may</i> change an outcome	Evidence of a positive (or negative) effect with no overriding contrary evidence
No discernible effects	The intervention <i>may result in little to no change</i> in an outcome	No affirmative evidence of effects
Mixed effects	The intervention <i>has inconsistent effects</i> on an outcome	Evidence includes studies in at least two of these categories: studies with positive effects, studies with negative effects, or more studies with indeterminate effects than with positive or negative effects

How is the PATHS® Program Implemented?

The following section provides details of how districts and schools can implement the PATHS® program. This information can help educators determine whether implementing this intervention would be feasible in their districts or schools. Information on the PATHS® program presented in this section comes from the studies that meet WWC standards (Humphrey et al., 2016; Kam et al., 2004) and from correspondence with the developer. Drs. Mark T. Greenberg and Carol A. Kusché are co-developers of the intervention, and PATHS Program LLC is the distributor. The PATHS® program is a Collaborative for Academic, Social, and Emotional Learning SElect program (CASEL) and a Blueprints Certified Model Program.

- **Goal:** The PATHS® program aims to promote emotional and social competencies and reduce aggression and behavior problems in elementary school children.
- **Target population:** The PATHS® program is designed for students in grades pre-K through 5, including general education students and students with disabilities.
- **Method of delivery:** The PATHS® program is a curriculum focused on social and emotional competencies. Through scripted lessons, elementary school teachers lead instruction, including a combination of whole-class and small-group instruction. The program also has in-home activities.

Comparison condition: In the two studies that contribute to this intervention report, students in the comparison group received typical instruction, which differed by study. In one study, typical instruction included schoolwide social and emotional learning initiatives, including components from UK's Social and Emotional Aspects of Learning (SEAL) initiative, the UK's National Healthy Schools program, and the Targeted Mental Health in Schools program. In the other study, typical instruction did not include any social and emotional learning.

- **Frequency and duration of service:** The PATHS® program is designed to be delivered over the course of one or multiple school years, with 20- to 40-minute sessions occurring two or three times per week for the entire school year.
- **Intervention components:** The PATHS® program has separate curricula for each grade level and can be modified for students with disabilities. Key components and features are described in Table 2.

Table 2. Components of the PATHS® program

Key component	Description
Lesson topics	Each lesson focuses on at least one of five topics (self-control, emotional literacy, social competence, positive peer relations, or interpersonal problem-solving skills), although aspects of all five topics are integrated into each lesson. <i>PATHS</i> ® lessons include instruction in identifying, labeling, and managing feelings; understanding the difference between feelings and behaviors; delaying gratification; controlling impulses; reducing stress; reading and interpreting social cues; understanding the perspectives of others; using steps for problem solving and decision making; having a positive attitude toward life; promoting self-awareness; and developing nonverbal and verbal communication skills. Lessons for each grade level include scripts for teachers but can be adapted to meet the needs of each classroom.
Delivery of lessons	<p>The <i>PATHS</i>® program is implemented by a classroom teacher as part of students' regular instruction. Lessons may use grade-appropriate materials included with the curriculum such as posters, charts, cards related to different emotions (Feeling Faces cards), books, coloring books, stickers, and puppets. Each <i>PATHS</i>® lesson ends with reminders and suggestions for generalizing what was taught to settings outside the classroom. For example, students might be instructed to complete "feeling faces cards," which help students recognize and be aware of how they are feeling at certain times of the school day. This can reinforce emotional awareness both in classrooms and in other settings. Finally, each <i>PATHS</i>® lesson includes suggestions or materials for engaging parents, such as a family letter that shares key concepts and objectives. These suggestions include descriptions of activities to conduct at home to extend learning and encourage practice and discussion.</p> <p>The program is designed to be delivered over the course of multiple school years, with 20- to 40-minute sessions occurring two or three times per week for the entire school year. In Humphrey et al. (2016), teachers implemented the program for two years with minor modifications to the content to account for British culture (for example, changing the word principal to headteacher, and the word soccer to football). These changes did not affect the program's core content or structure. In Kam et al. (2004), teachers implemented a pilot version of the curriculum over one school year with 60 lessons covering units on self-control, emotions, and problem solving. The lessons were modified for students in special education to focus primarily on behavioral self-control, rather than advanced problem solving.</p>
Teacher training	<p>The <i>PATHS</i>® program has six hours of online training for teachers that leads to certification. Teachers have access to training resources and materials online, including an introductory teacher manual. Additional support services, such as on-site training and coaching, are also available.</p> <p>Teacher training differed across the two studies included in this intervention report. In Humphrey et al. (2016), teachers received one full day of training and a half-day follow-up four months later, along with ongoing technical support and assistance from trained members of the research team. In Kam et al. (2004), teachers received an initial three-day training and weekly support during implementation with modeling, coaching, and feedback.</p>

What Does the PATHS® Program Cost?

This preliminary list of costs is not designed to be exhaustive; rather, it provides educators an overview of the major resources needed to implement the *PATHS*® program.

The program costs described in Table 3 are based on the information available as of January 2020.

Table 3. Cost ingredients for PATHS®

Cost ingredients	Description	Source of funding
Personnel	The <i>PATHS</i> ® program is delivered by a classroom teacher as part of students' regular instruction. Before implementing <i>PATHS</i> ®, teachers complete two online self-paced training modules (3 hours each), which are included when purchasing the classroom implementation package. Content presented during these online training sessions cover implementation and promoting schoolwide implementation. Teachers receive a training certificate in the <i>PATHS</i> ® program upon completing the training modules. Additional services, including full-day on-site training and coaching programs for teachers and school staff about embedding the <i>PATHS</i> ® program into their academic programming and schoolwide culture, are also available after initial training. Costs for these services are available from the developer upon request.	Schools provide time for teachers to participate in the training and to deliver the intervention.
Facilities	The intervention is typically implemented in the students' regular classrooms. For the training, teachers need access to computers and headsets.	School districts or schools provide the classroom facilities.
Equipment and materials	One classroom implementation package, which provides the materials needed for a single teacher to implement the program in one grade, costs \$439 to \$879, depending on grade level. Each package includes a teacher guide with scripts for each lesson, grade-level appropriate materials (such as books, coloring books, stickers, Feeling Faces cards, and puppets), a set of classroom posters, and 25 copies of materials for parents. The classroom package also includes access to online materials, including an introductory teacher manual and materials for teachers to use when communicating with families.	School districts or schools usually purchase <i>PATHS</i> ® materials. Funding typically comes from curriculum, counseling, school climate, and student mental health budgets, including federal Title I and Title IV-A accounts.

For More Information:

About the *PATHS*® Program

PATHS® Program LLC, 12408 West Encanto Boulevard, Avondale, AZ 85392

Email: info@pathsprogram.com. Web: <http://pathsprogram.com/>. Phone: (877) 71-PATHS (717-2847)

About the cost of the intervention

Web: <https://shop.pathsprogram.com/>

Research Summary

The WWC identified 35 studies that investigated the effectiveness of the *PATHS*® program (Figure 1):

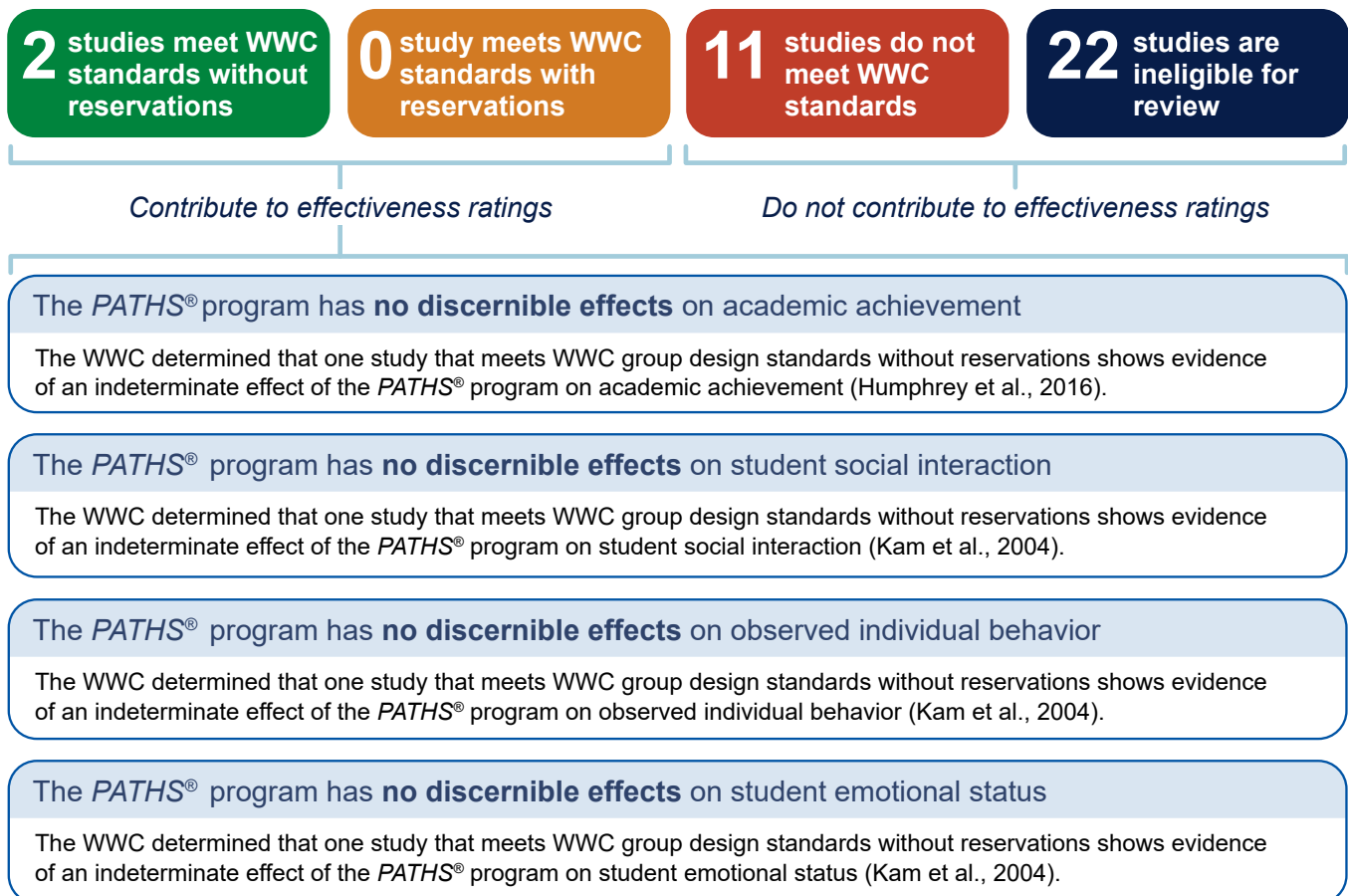
- 2 studies meet WWC group design standards without reservations
- 11 studies do not meet WWC group design standards
- 22 studies are ineligible for review

The WWC reviews findings on the intervention's effects on eligible outcome domains from studies that meet standards, either with or without reservations. Based on this review, the WWC generates an effectiveness rating, which summarizes how the intervention impacts, or changes, a particular outcome domain. The WWC reports additional supplemental findings, such as those the study authors reported for later follow-up periods, on the WWC website

(<https://whatworks.ed.gov>). These supplemental findings from studies that either do not meet WWC standards or are ineligible for review do not contribute to the effectiveness ratings.

The two studies of the *PATHS*® program that meet WWC group design standards reported findings on students' academic achievement, social interactions, observed individual behavior, and emotional status. No other findings meet WWC group design standards within any outcome domain included in the Supportive Learning Environment topic area.³ Citations for the 13 studies reviewed for this report are listed in the References section, which begins on page 11. Citations for the 22 studies that are ineligible for review and the reasons the WWC determined they were ineligible are also listed in the References section.

Figure 1. Effectiveness ratings for the *PATHS*® program



Main Findings

Table 4 shows the findings from the two studies of the PATHS® program that meet WWC standards. The table includes WWC calculations of the performance of the intervention group relative to the comparison group in terms of the mean difference and effect size. The effect size is a standardized measure of the effect of an intervention on outcomes, representing the average change expected for all individuals who are given the intervention (measured in standard deviations of the outcome measure). For the mean difference and effect size values, a positive number favors the intervention group and a negative number favors

the comparison group. A positive or negative improvement index does not necessarily mean the estimated effect is statistically significant.

Based on findings from one study that meets WWC standards and includes 1,582 students, the effectiveness rating for the academic achievement domain is no discernible effects. Based on findings from the second study that meets WWC standards and includes 113-133 students, the effectiveness ratings for the social interaction, observed individual behavior, and emotional status domains are no discernible effects.

Table 4. Findings by outcome domain from studies of the PATHS® program that meet WWC standards

Measure (study)	Study sample	Sample size	Mean (standard deviation)		WWC calculations			p-value
			Intervention group	Comparison group	Mean difference	Effect size	Improvement index	
United Kingdom Key Stage 2 English Test	Students in grade 5	1,582	28.07 (4.10)	28.52 (4.36)	-0.45	-0.11	-4	.04
United Kingdom Key Stage 2 Maths Test	Students in grade 5	1,582	28.64 (5.34)	28.77 (5.27)	-0.13	-0.03	-1	.62
Outcome average for academic achievement (Humphrey et al., 2016) ^a						-0.07	-3	Not statistically significant
Social Problem-Solving Interview	Students with disabilities in grades 1-3	133	nr	nr	na	nr	na	>.05
Teacher-Child Rating Scale: Assertive Social Skills	Students with disabilities in grades 1-3	113	nr	nr	na	nr	na	>.05
Teacher-Child Rating Scale: Assertive Task Orientation	Students with disabilities in grades 1-3	113	nr	nr	na	nr	na	>.05
Teacher-Child Rating Scale: Frustration Tolerance	Students with disabilities in grades 1-3	113	nr	nr	na	nr	na	>.05
Teacher-Child Rating Scale: Peer Sociability	Students with disabilities in grades 1-3	113	nr	nr	na	nr	na	>.05
Outcome average for student social interaction (Kam et al., 2004) ^b						nr	na	Not statistically significant
Child-Behavior Checklist-Teacher Report Form: Externalizing Behavior Subscale	Students with disabilities in grades 1-3	113	nr	nr	Favorable	nr	na	nr
Outcome average for observed individual behavior (Kam et al., 2004) ^b						nr	na	
Child-Behavior Checklist-Teacher Report Form: Internalizing Behavior Subscale	Students with disabilities in grades 1-3	113	nr	nr	Unfavorable	nr	na	nr
Childhood Depression Inventory (CDI)	Students with disabilities in grades 1-3	133	nr	nr	Favorable	nr	na	nr

(continued)

Measure (study)	Study sample	Sample size	Mean (standard deviation)		WWC calculations			p-value
			Intervention group	Comparison group	Mean difference	Effect size	Improvement index	
Kusché Affective Interview-Negative Feelings Words	Students with disabilities in grades 1-3	133	nr	nr	Favorable	nr	na	nr
Kusché Affective Interview-Positive Feelings Words	Students with disabilities in grades 1-3	133	nr	nr	na	nr	na	>.05
Outcome average for student emotional status (Kam et al., 2004)^b						nr	na	

Notes: Notes: Some statistics may not sum as expected due to rounding. While there were two studies that met WWC standards included in this report, the evidence of program effectiveness on academic achievement was included in a different study than the evidence of effectiveness on the social interaction, observed individual behavior, and emotional status domains.

na = not available; nr = not reported.

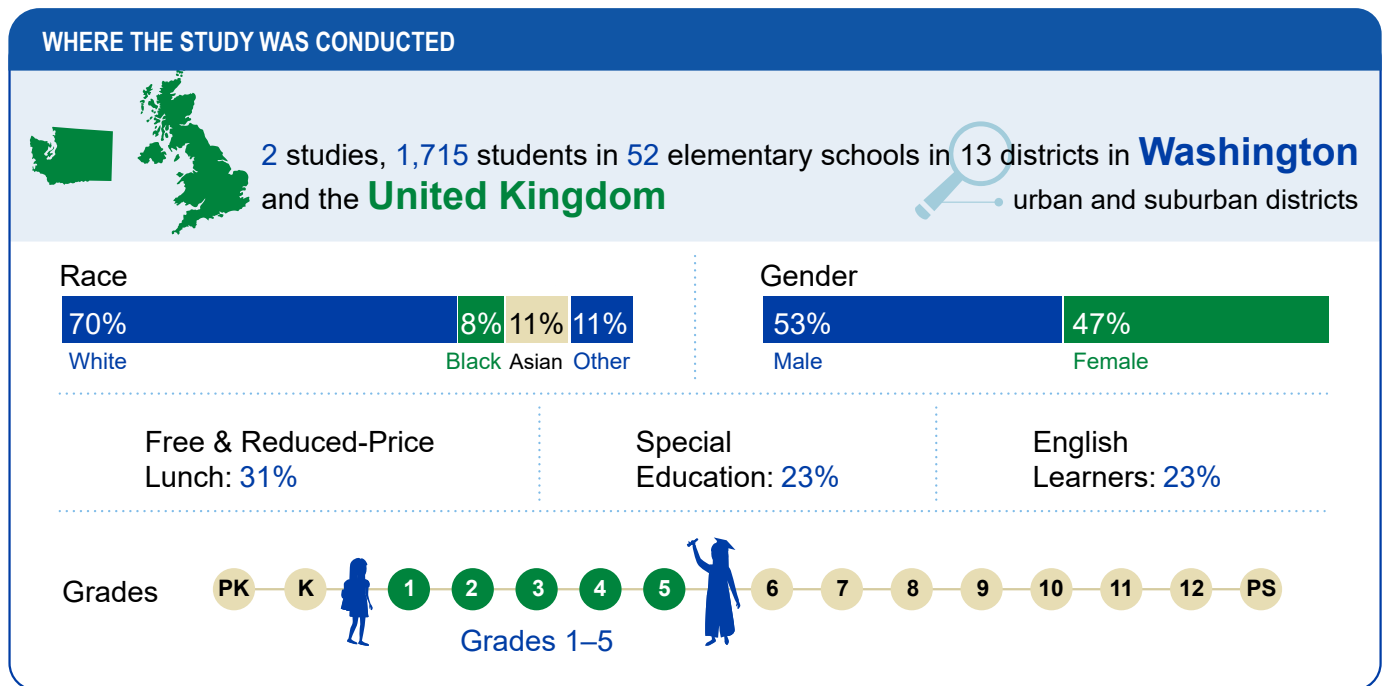
^a For Humphrey et al. (2016), the *p*-values presented here were calculated by the WWC because the study did not report exact *p*-values for these outcomes. The WWC applied the Benjamini-Hochberg correction for multiple comparisons within the domain. This resulted in a WWC-computed critical *p*-value of .025 for the United Kingdom Key Stage 2 English measure; therefore, the WWC did not find the result to be statistically significant, as the *p*-value for the finding of .04 is greater than the critical *p*-value of .025. The study is characterized as having indeterminate effects on academic achievement because the mean effect reported is not statistically significant.

^b For Kam et al. (2004), the WWC was unable to present most findings because the study reports the rate of growth of students in the intervention and comparison groups, across four points in time using growth curve analyses. These analyses do not provide point-in-time impact estimates required by the WWC, or related *p*-values. The *p*-values presented here for the student social interaction and student emotional status domains were obtained through an author query. This query did not yield the unadjusted means and standard deviations needed to calculate effect sizes but it did provide the direction of the point-in-time findings (favorable, unfavorable, or no effect; see the [WWC Procedures Handbook](#), version 4.0, page 34). The author query also showed that, for the outcomes in the student social interaction domain and the Kusché Affective Interview-Positive Feelings Words outcome in the student emotional status domain, the intervention had no effect (denoted as "na" in the mean difference column above). The study is therefore characterized as having indeterminate effects on the student emotional status, observed individual behavior, and student social interaction domains. For more information, please refer to the [WWC Procedures Handbook](#), version 4.0, page 23.

In What Context Was the PATHS® Program Studied?

The following section provides information on the setting of the two studies of the PATHS® program that meet WWC standards, and a description of the participants in the research. This information can help educators understand

the context in which the studies of the PATHS® program were conducted, and determine whether the program might be suitable for their setting.



Details of Each Study that Meets WWC Standards

This section presents details for each study of the PATHS® program that meets WWC standards. These details include the full study reference, findings description, findings summary, and description of study characteristics. A summary of domain findings for each study is presented below, followed by a description of the study characteristics. These study-level details include contextual information around the study setting, methods, sample, intervention group, comparison group, outcomes, and implementation details. For additional information, readers should refer to the original studies.

Research details for Humphrey et al. (2016)

Humphrey, N., Barlow, A., Wigelsworth, M., Lendrum, A., Pert, K., Joyce, C., Stephens, E., Wo, L., Squires, G., Woods, K., Calam, R., & Turner, A. (2016). A cluster randomized controlled trial of the Promoting Alternative Thinking Strategies (PATHS®) curriculum. *Journal of School Psychology, 58*, 73–89.

Findings from Humphrey et al. (2016) show evidence of an indeterminate effect of the PATHS® program in the academic achievement domain (Table 5). The findings and research details summarized for this study come from three related citations, including the primary study listed above. See the References section, which begins on page 11, for a list of all related publications.

Table 5. Summary of findings from Humphrey et al. (2016)

Outcome domain	Sample size	Meets WWC Group Design Standards Without Reservations		
		Average effect size	Improvement index	Statistically significant
Academic achievement	45 schools and 1,582 students	-0.07	-3	No

Table 6. Description of study characteristics for Humphrey et al. (2016)

WWC evidence rating	Meets WWC Group Design Standards Without Reservations. This is a cluster randomized controlled trial (RCT) with low cluster-level attrition and low individual-level non-response. For more information on how the WWC assigns study ratings, please see the WWC Procedures and Standards Handbooks (version 4.0) and WWC Standards Briefs , available on the WWC website.
Setting	The study took place in 45 mainstream primary schools in 10 districts within the Greater Manchester region of the United Kingdom.
Methods	The study assigned 23 schools to the intervention group and 22 schools to the comparison group prior to the start of the school year. Schools were assigned to study conditions by a group called the Manchester Academic Health Science Centre Trials Co-ordination Unit. The random assignment procedure used a form of adaptive stratification by first balancing the two samples on proportions of children eligible for free school meals and non-native English speakers. The WWC considers this procedure to be equivalent to random assignment so long as the assignment is determined by chance. The assignment was conducted independently of the study authors by the Clinical Trials Unit at the Manchester Academic Health Science Center. At the time of assignment, there were 847 students in the intervention group and 784 students in the comparison group for the outcomes that met WWC evidence standards. The schools were assigned to conditions when the students were in grade 3 (year 4 in the UK) and outcomes were measured two years later when the students were in grade 5. The sample loss after random assignment (attrition) was within the acceptable threshold for the two measures in the academic achievement domain measured in grade 5. Overall non-response at the student level for these outcomes was 3%, and the differential non-response rate was 0.4 percentage points.
Study sample	At the time of outcome measurement, the 45 schools in the analytic sample included 1,582 grade 5 students, with 823 students in the intervention group and 759 students in the comparison group. Among students in the schools, roughly half were male, 70% were White, 12% were Asian, 7% were Black, 17% were identified as students with disabilities, 31% were eligible for free or reduced-price lunch, and 23% used English as a second language.
Intervention group	Students in the intervention group received the <i>PATHS</i> [®] program for a two-year period. <i>PATHS</i> [®] lessons occurred during normal class time, typically in the period reserved for personal, social, and health education and lasted approximately 30 to 40 minutes. The study team made surface-level changes to the language and examples in the <i>PATHS</i> [®] program to make it more relevant for a British sample. This was accomplished by altering vocabulary, photographs, cultural references, or names used in lessons (for example, changing the word principal to headteacher, and the word soccer to football).
Comparison group	Students assigned to the comparison condition received the "business-as-usual" instruction that was available in their schools, including lessons in personal, social, and health education; the whole-school component of UK's Social and Emotional Aspects of Learning (SEAL) program; circle time; nurture groups; the UK's National Healthy Schools program at the universal level; and the Targeted Mental Health in Schools program.
Outcomes and measurement	<p>Findings on two outcome measures that are eligible for review in the academic achievement domain under the Supportive Learning Environment topic area met WWC group design standards. In grade 5, school staff administered the national end-of-year test, the United Kingdom Key Stage 2 Standardized Assessment, in English and math. Baseline data were measured through the national Key Stage 1 Standardized Assessment, administered by school staff during grade 1 in the same two subjects.</p> <p>Findings on six additional outcomes were reported but did not meet WWC group design standards. These outcomes include academic outcomes measured in grade 4 using the Interactive Computerized Assessment System for reading and math, the Social Skills Improvement System and its subscales, attendance, and measures of psychological well-being, social support, and school environment; the findings on each of these outcomes did not meet WWC group design standards because school-level attrition was high with respect to these measures and the study did not provide information needed to assess baseline equivalence. The authors did not reply to an author query to obtain this information</p> <p>Finally, findings on three other outcomes were reported but were not eligible for review under the Supportive Learning Environment protocol (version 4.0) because these measures were assessed by teachers involved in delivering the intervention. These outcomes were the Social and Emotional Competence Change Index, Kidscreen-27, and Strengths and Difficulties Questionnaire.</p>
Additional implementation details	Teachers in schools that implemented the <i>PATHS</i> [®] program received one full day of initial training with a half-day follow-up four months later, designed to familiarize teachers with the <i>PATHS</i> [®] curriculum. Certified trainers from the Pennsylvania State University delivered the training. Teachers in schools implementing the <i>PATHS</i> [®] program also received an implementation guidance manual developed by the research team and ongoing technical support and assistance from three members of the research team, who had also been trained by Pennsylvania State University trainers.

Research details for Kam et al. (2004)

Kam, C. M., Greenberg, M. T., Kusché, & C. A. (2004). Sustained effects of the PATHS® curriculum on the social and psychological adjustment of children in special education. *Journal of Emotional & Behavioral Disorders*, 12(2) 66-78. Retrieved from <https://eric.ed.gov/?id=EJ694140>

Findings from Kam et al. (2004) show evidence of indeterminate effects of the PATHS® program in the student social interaction, observed individual behavior, and emotional status domains (Table 7). These findings are based on an analysis of six outcomes in the student social interaction

domain, one outcome in the observed individual behavior domain, and three outcomes in the student emotional status domain. The study examines outcomes for students with disabilities only.

Findings from Humphrey et al. (2016) show evidence of an indeterminate effect of the PATHS® program in the academic achievement domain (Table 5). The findings and research details summarized for this study come from three related citations, including the primary study listed above. See the References section, which begins on page 11, for a list of all related publications.

Table 7. Summary of findings from Kam et al. (2004)

		Meets WWC Group Design Standards Without Reservations		
		Study findings		
Outcome domain	Sample size	Average effect size	Improvement index	Statistically significant
Student social interaction	18 classrooms and 133 students	nr	na	No
Observed individual behavior	18 classrooms and 113 students	nr	na	No
Student emotional status	18 classrooms and 133 students	nr	na	No

na = not available; nr = not reported.

Table 8. Description of study characteristics for Kam et al. (2004)

WWC evidence rating	Meets WWC Group Design Standards Without Reservations. This is a cluster RCT with low cluster-level attrition and low individual-level non-response.
Setting	The study took place in seven elementary schools in Seattle, Highline, and Shoreline school districts in Washington. Students were primarily educated in self-contained classrooms, in which a special education teacher was responsible for the instruction of academic subjects. The classrooms were mixed-aged classrooms and served students in grades 1 to 3. All students in the study had disabilities.
Methods	The researchers randomly assigned 9 classrooms to the intervention group and 9 classrooms to the comparison group. The study included 133 students with disabilities in the 18 classrooms with parent consent for their participation (62 students in the intervention group and 71 students in the comparison group). The sample loss after random assignment (attrition) was within the acceptable threshold for the review. There was no attrition of classrooms from the sample. Overall non-response across follow-up periods at the student level was 0% at the 1-month follow-up and 15% at the 13-month follow-up, and the differential non-response rate was 0 percentage points at the 1-month follow-up and 5 percentage points at the 13-month follow-up.
Study sample	The analytic sample included 51 students in the intervention group and 62 students in the comparison group for six teacher-reported outcomes. A separate analytic sample included 62 students in the intervention group and 71 in the comparison group for four student-reported outcomes. Of the students subject to random assignment, 73% were male, 66% were White, and 20% were African American. In addition, 40% of the sample had a learning disability, 17% had mild mental retardation, 23% had emotional and behavioral disorders, 16% had physical disabilities or health impairments, and 4% had multiple disabilities. The students in the study were in grades 1–3. Their average age was 8.7 years old.
Intervention condition	The <i>PATHS</i> [®] curriculum consisted of 60 lessons delivered during one school year, beginning in early October and concluding in early April. Lessons lasted 20 to 30 minutes and were taught approximately three times per week. The curriculum used in this study was adapted for students with disabilities. The original version of the <i>PATHS</i> [®] curriculum at the time of study had units on self-control, emotions, and problem solving. The adapted version of the <i>PATHS</i> [®] program used in this study placed a stronger focus on reinforcing behavioral self-control and a lesser focus on advanced problem solving than the original curriculum.
Comparison condition	Students in classrooms assigned to the comparison condition received "business-as-usual" instruction. The comparison group did not receive instruction focused on social and emotional competencies.
Outcomes and measurement	<p>Study authors reported findings on a total of 10 outcome measures that are eligible for review under the Supportive Learning Environment topic area.</p> <p>There were four student-reported outcomes. In the Kusché Affective Interview, students list as many feelings as they can. Raters count the total number of positive feeling words mentioned as the Kusché Affective Interview-Positive Feeling Words outcome, and the total number of negative feeling words mentioned as the Kusché Affective Interview- Negative Feeling Words outcome; both outcomes were reviewed in the student emotional status domain and inter-rater reliability for both measures was 0.91. The Social Problem-Solving Interview, an author-developed measure, assesses the social thinking skills of students, measured through how well students could effectively solve problems presented in the stories. Students were scored on the number and effectiveness of the problem-solving strategies described. This outcome was reviewed in the student social interaction domain; the inter-rater reliability was 0.86. The Childhood Depressive Inventory (Kovacs 1983; 1992) includes 27 items, in which students were asked to describe their feelings over the prior two weeks. This outcome was reviewed in the student emotional status domain; inter-rater reliability ranged from 0.71 to 0.89.</p> <p>There were six teacher-reported outcomes. The Child-Behavior Checklist Teacher Report Form is a 118-item checklist of student behavioral or emotional problems administered to teachers. The authors created two subscale scores from the checklist: internalizing behavior (reviewed in the student emotional status domain; test-retest reliability was 0.91) and externalizing behavior (reviewed in the observed individual behavior domain; test-retest reliability was 0.92). The authors also used four outcomes from the Teacher-Child Rating Scale, which is a 20-item measure with 5-point rating scales that teachers use to assess children's behavior. The four outcomes (Frustration Tolerance, Assertive Social Skills, Assertive Task Orientation, and Peer Sociability) were reviewed in the student social interaction domain; internal validity for the measures ranged from 0.85 to 0.95.</p> <p>The Supportive Learning Environment topic area protocol prioritizes outcomes measured closest to the end of the intervention, which are those measured one month after the end of the intervention in this study. However, the six teacher-reported measures were ineligible for review under the Supportive Learning Environment topic area at the one-month follow-up period because the measures were completed by teachers involved in the intervention. For these outcomes, the 13-month follow-up measures, which were completed by different teachers not involved in the intervention, met WWC standards and are used in this report. For the four student-reported outcomes, the one-month follow-up measures are the primary outcomes reported here.</p> <p>The outcomes measured at follow-up periods after the primary follow-up period for each outcome were considered supplemental. One supplemental finding met WWC group design standards: the Kusché Affective Interview-Negative Feeling Words outcome, measured at 25 months after the end of the intervention. This supplemental finding is reported on the WWC website (https://whatworks.ed.gov) and does not factor into the intervention's rating of effectiveness.</p>
Additional implementation details	Teachers in the intervention group attended a three-day training. During the implementation of the <i>PATHS</i> [®] program, the study team provided weekly support for teachers by modeling lessons, coaching, and providing feedback to teachers.

References

Studies that meet WWC group design standards

- Humphrey, N., Barlow, A., Wigelsworth, M., Lendrum, A., Pert, K., Joyce, C., Stephens, E., Wo, L., Squires, G., Woods, K., Calam, R., & Turner, A. (2016). A cluster randomized controlled trial of the Promoting Alternative THinking Strategies (PATHS®) curriculum. *Journal of School Psychology, 58*, 73-89.
- Additional source:**
Hennessey, A., & Humphrey, N. (2019). Can social and emotional improve children academic progress? Findings from a randomized controlled trial of Promoting Alternative Thinking Strategies (PATHS) curriculum. *European Journal of Psychology of Education, 35*(4), 751-774. Retrieved from <https://eric.ed.gov/?id=EJ1272821>
- Humphrey, N., Barlow, A., & Lendrum, A. (2018). Quality matters: Implementation moderates student outcomes in the PATHS Curriculum. *Prevention Sciences, 19*, 197-208. doi: 10.1007/s11121-017-0802-4
- Humphrey, N., Barlow, A., Wigelsworth, M., Lendrum, A., Pert, K., Joyce, C., Stephens, E., Wo, L., Squires, G., Woods, K., Calam, R., Harrison, M., & Turner, A. (2015). Promoting Alternative Thinking Strategies (PATHS): *Evaluation report and Executive Summary*. University of Manchester: Author. Retrieved from <https://eric.ed.gov/?id=ED581278>
- Humphrey, N., Hennessey, A., Lendrum, A., Wigelsworth, M., Turner, A., Panayiotou, M., Joyce, C., Pert, K., Stephens, E., Wo, L., Squires, G., Woods, K., Harrison, M., & Calam, R. (2018). The PATHS curriculum for promoting social and emotional well-being among children aged 7-9 years: A cluster RCT. *Public Health Research, 6*(10). doi:10.23310/phr06100
- Panayiotou, N., Humphrey, N., & Hennessey, A. (2020). Implementation matters: Using complier average causal effect estimation to determine the impact of the Promoting Alternative Thinking Strategies (PATHS) curriculum on children's quality of life. *Journal of Educational Psychology, 112*(2), 236-253. Retrieved from <https://eric.ed.gov/?id=EJ1240931>
- Kam, C.-M., Greenberg, M. T., & Kusché, C. A. (2004). Sustained effects of the PATHS® curriculum on the social and psychological adjustment of children in special education. *Journal of Emotional & Behavioral Disorders, 12*(2), 66-78. Retrieved from <https://eric.ed.gov/?id=EJ694140>

Studies that do not meet WWC group design standards

- Berry, V., Axford, N., Blower, S., Taylor, R., Edwards, R., Tobin, K., Jones, C., & Bywater, T. (2016). The effectiveness and micro-costing analysis of a universal, school-based, social-emotional learning programme in the UK: A cluster-randomised controlled trial. *School Mental Health, 8*(2), 238-256. Retrieved from <https://eric.ed.gov/?id=EJ1229051>. The study does not meet WWC standards because the analysis does not provide a credible measure of the effectiveness of the intervention.
- Bierman, K. L., Coie, J. D., Dodge, K. A., Greenberg, M. T., Lochman, J. E., McMahon, R. J., & Pinderhughes, E. (2010). The effects of a multiyear universal social-emotional learning program: The role of student and school characteristics. *Journal of Consulting and Clinical Psychology, 78*(2), 156-168. Retrieved from <https://eric.ed.gov/?id=EJ878756>. The study does not meet WWC standards because the analytic sample of individuals must be representative of the clusters but the requirement was not satisfied.
- Bowen-Lipscomb, D. C. (2004). *The effects of participating in the P.A.T.H.S. program on academic achievement of at-risk students in an empowered urban school district*. ProQuest Dissertations and Theses. The study does not meet WWC standards because the equivalence of the clusters in the analytic intervention and comparison groups is necessary but the requirement was not satisfied.
- Crean, H. F., & Johnson, D. B. (2013). Promoting Alternative Thinking Strategies (PATHS®) and elementary school aged children's aggression: Results from a cluster randomized trial. *American Journal of Community Psychology, 52*(1), 56-72. The study does not meet WWC standards because the analytic sample of individuals must be representative of the clusters but the requirement was not satisfied.
- Curtis, C., & Norgate, R. (2007). An evaluation of the Promoting Alternative Thinking Strategies curriculum at Key Stage 1. *Educational Psychology in Practice, 23*(1), 33-44. Retrieved from <https://eric.ed.gov/?id=EJ764162>. The study does not meet WWC standards because the equivalence of the clusters in the analytic intervention and comparison groups is necessary but the requirement was not satisfied.
- Fishbein, D., Domitrovich, C., Williams, J., Gitukui, S., Guthrie, C., Shapiro, D., Greenberg, M., & Fishbein, D. H. (2016). Short-term intervention effects of the PATHS® curriculum in young low-income children: Capitalizing on plasticity. *Journal of Primary Prevention, 37*(6), 493-511. The study does not meet WWC standards because the analysis does not provide a credible measure of the effectiveness of the intervention.

- Johannes, E. M. (2003). *Effects of PATHS® after school program on children's social environment and behavior*. ProQuest Dissertations and Theses. The study does not meet WWC standards because the measures of effectiveness cannot be attributed solely to the intervention.
- Kam, C.-M., Greenberg, M., & Walls, C. (2003). Examining the role of implementation quality in school-based prevention using the PATHS® curriculum. *Prevention Science, 4*(1), 55-63. The study does not meet WWC standards because it includes only outcomes that are overlapped with the intervention or measured in a way that is inconsistent with the protocol.
- McMahon, R. J., & Canal, N. (1999). Initial impact of the Fast Track prevention trial for conduct problems: II. Classroom effects. *Journal of Consulting & Clinical Psychology, 67*(5), 648-657. The study does not meet WWC standards because the equivalence of the clusters in the analytic intervention and comparison groups is necessary but the requirement was not satisfied.
- Additional source:**
Conduct Problems Prevention Research Group. (2010). Fast Track intervention effects on youth arrests and delinquency. *Journal of Experimental Criminology, 6*(2), 131-157.
- Ross, S. M., Sheard, M. K., Cheung, A., Elliott, L., & Slavin, R. (2011). Promoting primary pupils' social-emotional learning and pro-social behaviour: Longitudinal evaluation of the Together 4 All Programme in Northern Ireland. *Effective Education, 3*(2), 61-81. The study does not meet WWC standards because the equivalence of the clusters in the analytic intervention and comparison groups is necessary but the requirement was not satisfied.
- Seifer, R., Gouley, K., Miller, A. L., & Zakriski, A. (2004). Implementation of the PATHS® curriculum in an urban elementary school. *Early Education & Development, 15*(4), 471-485. Retrieved from <https://eric.ed.gov/?id=EJ757472>. The study does not meet WWC standards because it uses a quasi-experimental design in which the analytic intervention and comparison groups do not satisfy the baseline equivalence requirement.
- Studies that are ineligible for review using the Supportive Learning Environment Protocol**
- Arda, T. B., & Ocak, Ş. (2012). Social competence and Promoting Alternative Thinking Strategies - PATHS preschool curriculum. *Educational Sciences: Theory & Practice, 12*(4), 2691-2698. The study is ineligible for review because it does not use a study design eligible for review under the WWC's group design standards, regression discontinuity design standards, or pilot single-case design standards, as described in the [WWC Standards Handbook \(Version 4.0\)](#).
- Becker, K., Bohnenkamp, J., Domitrovich, C., Keperling, J., & Ialongo, N. (2014). Online training for teachers delivering evidence-based preventive interventions. *School Mental Health, 6*(4), 225-236. The study is ineligible for review because it does not include an outcome eligible for review under the [Supportive Learning Environment review protocol \(Version 4.0\)](#).
- Berg, J., Bradshaw, C., Jo, B., & Ialongo, N. (2017). Using complier average causal effect estimation to determine the impacts of the good behavior game preventive intervention on teacher implementers. *Administration & Policy in Mental Health & Mental Health Services Research, 44*(4), 558-571. This study is ineligible for review because it does not include an outcome eligible for review under the [Supportive Learning Environment review protocol \(Version 4.0\)](#).
- Bilir Seyhan, G., Ocak Karabay, S., Arda Tuncdemir, T. B., Greenberg, M. T., & Domitrovich, C. (2017). The effects of Promoting Alternative Thinking Strategies preschool program on teacher-child relationships and children's social competence in Turkey. *International Journal of Psychology, 54*(1), 61-69. This study is ineligible for review because it does not include an outcome eligible for review under the [Supportive Learning Environment review protocol \(Version 4.0\)](#).
- Chauveron, L. M., & Perkins, D. F. (2009). Prevention in context: Classroom heterogeneity as a moderator of PATHS® effectiveness. *Journal of Children's Services, 4*(1), 44-59. The study is ineligible for review because it does not use a study design eligible for review under the WWC's group design standards, regression discontinuity design standards, or pilot single-case design standards, as described in the [WWC Standards Handbook \(Version 4.0\)](#).
- Domitrovich, C., Bradshaw, C., Berg, J., Pas, E., Becker, K. D., Musci, R., Embry, D., Ialongo, N., & Embry, D. D. (2016). How do school-based prevention programs impact teachers? Findings from a randomized trial of an integrated classroom management and social-emotional program. *Prevention Science, 17*(3), 325-337. This study is ineligible for review because the intervention of interest is bundled with another intervention.
- Fardy, P. S., Azzollini, A., Magel, J. R., White, R. E., Schmitz, M. K., Agin, D., Clark, L. T., Bayne-Smith, M., Kohn, S., & Tekverk, L. (2000). Gender and ethnic differences in health behaviors and risk factors for coronary disease among urban teenagers: The PATH® program. *The Journal of Gender-Specific Medicine, 3*(2), 59-68. The study is ineligible for review because it does not use a study design eligible for review under the WWC's group design standards, regression discontinuity design standards, or pilot single-case design standards, as described in the [WWC Standards Handbook \(Version 4.0\)](#).
- Fishman, M., & Wille, J. (2014). Head Start CARES for migrant and seasonal families: Adapting a preschool social-emotional curriculum (OPRE Report 2014-43). New York: MDRC. Retrieved from: <https://eric.ed.gov/?id=ED546645> The study is ineligible for review because it does not use a study design eligible for review under the WWC's group design standards, regression discontinuity design standards, or pilot single-case design standards, as described in the [WWC Standards Handbook \(Version 4.0\)](#).
- Hamre, B. K., Pianta, R. C., Mashburn, A. J., & Downer, J. T. (2012). Promoting young children's social competence through the preschool PATHS® curriculum and MyTeachingPartner professional development

- resources. *Early Education & Development*, 23(6), 809-832. The study is ineligible for review because it does not include sample members with characteristics specified in the [Supportive Learning Environment review protocol \(Version 4.0\)](#).
- Honess, A., & Hunter, D. (2014). Teacher perspectives on the implementation of the PATHS® curriculum. *Educational Psychology in Practice*, 30(1), 51-62. Retrieved from <https://eric.ed.gov/?id=EJ1028590>. The study is ineligible for review because it does not use a study design eligible for review under the WWC's group design standards, regression discontinuity design standards, or pilot single-case design standards, as described in the [WWC Standards Handbook \(Version 4.0\)](#).
- Hughes, C., & Cline, T. (2015). An evaluation of the preschool PATHS® curriculum on the development of preschool children. *Educational Psychology in Practice*, 31(1), 73-85. Retrieved from <https://eric.ed.gov/?id=EJ1050631>. The study is ineligible for review because it does not use a study design eligible for review under the WWC's group design standards, regression discontinuity design standards, or pilot single-case design standards, as described in the [WWC Standards Handbook \(Version 4.0\)](#).
- Ialongo, N. S., Domitrovich, C., Embry, D., Greenberg, M., Lawson, A., Becker, K. D., & Bradshaw, C. (2019). A randomized controlled trial of the combination of two school-based universal preventive interventions. *Developmental Psychology*, 55(6), 1313-1325. Retrieved from <https://eric.ed.gov/?id=EJ1216803>. This study is ineligible for review because the intervention of interest is bundled with another intervention.
- Kelly, B., Edgerton, C., Graham, S., Robertson, E., & Syme, B. (2015). Parents and the preschool PATHS® (Promoting Alternative Thinking Strategies) curriculum. *Journal of Children's Services*, 10(3), 231-241. The study is ineligible for review because it does not use a study design eligible for review under the WWC's group design standards, regression discontinuity design standards, or pilot single-case design standards, as described in the [WWC Standards Handbook \(Version 4.0\)](#).
- Kusché, C. (2002). Psychoanalysis as prevention: Using PATHS® to enhance ego development, object relationships, & cortical integration in children. *Journal of Applied Psychoanalytic Studies*, 4(3), 283-301. The study is ineligible for review because it does not use a study design eligible for review under the WWC's group design standards, regression discontinuity design standards, or pilot single-case design standards, as described in the [WWC Standards Handbook \(Version 4.0\)](#).
- McCarthy, V. L., Bowland, S., Nayar, E., Connelly, J., & Woge, A. (2018). Developing a new perspective in late life: The PATH program. *Journal of Adult Development*, 26, 304-320. The study is ineligible for review because it does not use a study design eligible for review under the WWC's group design standards, regression discontinuity design standards, or pilot single-case design standards, as described in the [WWC Standards Handbook \(Version 4.0\)](#).
- Panayiotou, M., Humphrey, N., & Wigelsworth, M. (2019). An empirical basis for linking social and emotional learning to academic performance. *Contemporary Educational Psychology*, 56, 193-204. The study is ineligible for review because it does not use a study design eligible for review under the WWC's group design standards, regression discontinuity design standards, or pilot single-case design standards, as described in the [WWC Standards Handbook \(Version 4.0\)](#).
- Rossi, L., Fletcher, J., & Harvey, R. (2008). The relationship between language skills and outcomes of the PATHS® curriculum. *Australian Educational and Developmental Psychologist*, 25(2), 62-77. The study is ineligible for review because it does not use a study design eligible for review under the WWC's group design standards, regression discontinuity design standards, or pilot single-case design standards, as described in the [WWC Standards Handbook \(Version 4.0\)](#).
- Schonfeld, D., Adams, R., Fredstrom, B., Tomlin, R., Voyce, C., & Vaughn, L. (2012). Social-emotional learning in grades 3 to 6 and the early onset of sexual behavior. *Sexuality Research & Social Policy*, 9(2), 178-186. This study is ineligible for review because the intervention of interest is bundled with another intervention.
- Stanley, L. (2018). Is the preschool paths curriculum effective? A review. *Journal of Evidence-Informed Social Work*, 16(2), 130-143. The study is ineligible for review because it does not use a study design eligible for review under the WWC's group design standards, regression discontinuity design standards, or pilot single-case design standards, as described in the [WWC Standards Handbook \(Version 4.0\)](#).
- Turner, A. J. (2017). *Economic analysis of the causes and consequences of social and emotional well-being in childhood*. The University of Manchester (United Kingdom). The study is ineligible for review because it does not use a study design eligible for review under the WWC's group design standards, regression discontinuity design standards, or pilot single-case design standards, as described in the [WWC Standards Handbook \(Version 4.0\)](#).
- Wilson, B. C. (2016). *The effectiveness of Promoting Alternative Thinking Strategies (PATHS®) when used one time per week in therapeutic day treatment*. ProQuest Dissertations and Theses. The study is ineligible for review because it does not use a study design eligible for review under the WWC's group design standards, regression discontinuity design standards, or pilot single-case design standards, as described in the [WWC Standards Handbook \(Version 4.0\)](#).
- Zhang, D., Grenwelge, C., & Petcu, S. (2018). Preparing individuals with disabilities for inclusive employment through the Postsecondary Access and Training in Human Services (PATHS) program: Inclusive employment. *Inclusion*, 6(3), 224-233. The study is ineligible for review because it does not use a study design eligible for review under the WWC's group design standards, regression discontinuity design standards, or pilot single-case design standards, as described in the [WWC Standards Handbook \(Version 4.0\)](#).

Endnotes

¹The descriptive information for this intervention comes from the product website and overview: <https://pathsprogram.com/what-is-paths>. The What Works Clearinghouse (WWC) requests that developers review the intervention description sections for accuracy from their perspective. The WWC provided the developer with the intervention description in May 2020, and the WWC incorporated feedback from the developer. Further verification of the accuracy of the descriptive information for this intervention is beyond the scope of this review.

²The literature search reflects documents publicly available by February 2020. Reviews of the studies in this report used the standards from the WWC Procedures and Standards Handbooks (version 4.0) and the Supportive Learning Environment review protocol (version 4.0).

³The effects of the *PATHS*[®] program are not known for other outcome domains within the Supportive Learning Environment topic area, including educator discipline practice, educator instructional practice, school climate, and school equity.

Recommended Citation

What Works Clearinghouse, Institute of Education Sciences, U.S. Department of Education. (March 2021). *Promoting Alternative THinking Strategies (PATHS[®])*. Retrieved from <https://whatworks.ed.gov>.