

The WSIPP benefit-cost analysis examines, on an apples-to-apples basis, the monetary value of programs or policies to determine whether the benefits from the program exceed its costs. WSIPP's research approach to identifying evidence-based programs and policies has three main steps. First, we determine "what works" (and what does not work) to improve outcomes using a statistical technique called meta-analysis. Second, we calculate whether the benefits of a program exceed its costs. Third, we estimate the risk of investing in a program by testing the sensitivity of our results. For more detail on our methods, see our [Technical Documentation](#).

Current estimates replace old estimates. Numbers will change over time as a result of model inputs and monetization methods.

Becoming a Man (BAM) with high-dosage tutoring Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated April 2018.

Program Description: Becoming a Man (BAM) is a high school behavioral program that offers non-academic intervention to disadvantaged and at-risk males through exposure to prosocial adults and skill training based on cognitive behavioral therapy. The program focuses on teaching character and social-emotional skills including considering another person's perspective, evaluating consequences ahead of time, and reducing automatic decision-making. Participants attend weekly one-hour group sessions offered during the school day. The program included in this analysis combines BAM with individualized math tutoring conducted for one hour each day in groups of two students.

Benefit-Cost Summary Statistics Per Participant

Benefits to:

| | | | |
|----------------------------|------------------|---------------------------------|----------|
| Taxpayers | \$10,485 | Benefit to cost ratio | \$8.30 |
| Participants | \$21,076 | Benefits minus costs | \$33,641 |
| Others | \$8,591 | Chance the program will produce | |
| Indirect | (\$1,903) | benefits greater than the costs | 73 % |
| Total benefits | \$38,249 | | |
| Net program cost | (\$4,608) | | |
| Benefits minus cost | \$33,641 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|--|-----------------|-----------------|---------------------|-----------------------|-----------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Labor market earnings associated with test scores | \$21,299 | \$9,672 | \$9,479 | \$0 | \$40,450 |
| Health care associated with educational attainment | (\$222) | \$812 | (\$888) | \$407 | \$109 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$2,310) | (\$2,310) |
| Totals | \$21,076 | \$10,485 | \$8,591 | (\$1,903) | \$38,249 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²“Others” includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³“Indirect benefits” includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

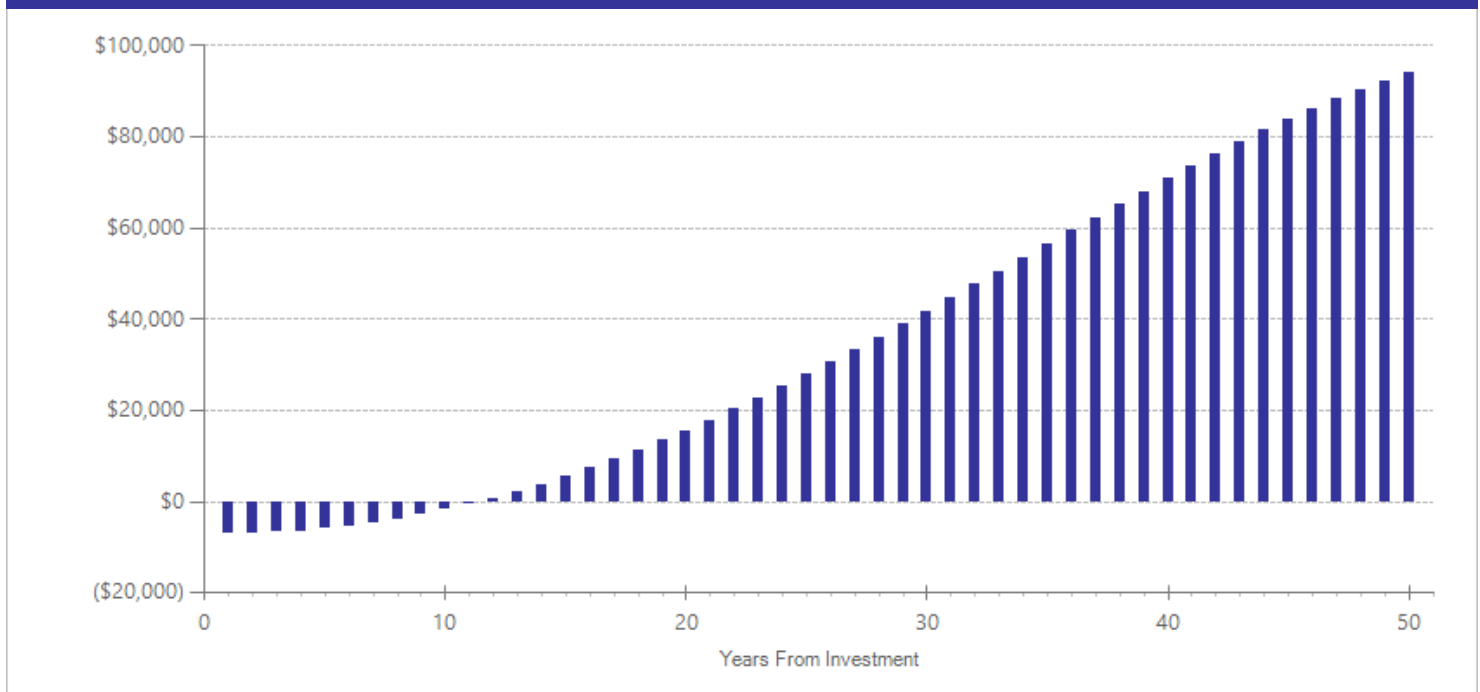
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|---------------------|
| Program costs | \$4,400 | 2013 | Present value of net program costs (in 2017 dollars) | (\$4,608) |
| Comparison costs | \$0 | 2013 | | Cost range (+ or -) |

The intervention in this analysis occurred over one school year. The estimated cost for BAM with high-dosage tutoring is \$4,400 per student as reported in Cook, P.J., Dodge, K., Farkas, G., Fryer, R.G., Guryan, J., Ludwig, J., ... Steinberg, L. (2014). The (surprising) efficacy of academic and behavioral intervention with disadvantaged youth: Results from a randomized experiment in Chicago (NBER Working Paper 19862). Cambridge, MA: National Bureau of Economic Research.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

| Meta-Analysis of Program Effects | | | | | | | | | | | |
|--|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| Grade point average [^] | 16 | 1 | 72 | 0.350 | 0.210 | 16 | n/a | n/a | n/a | 0.350 | 0.095 |
| Office discipline referrals [^] | 16 | 1 | 72 | 0.073 | 0.208 | 16 | n/a | n/a | n/a | 0.073 | 0.726 |
| School attendance [^] | 16 | 1 | 68 | 0.352 | 0.221 | 16 | n/a | n/a | n/a | 0.352 | 0.111 |
| Suspensions/expulsions [^] | 16 | 1 | 68 | -0.210 | 0.220 | 16 | n/a | n/a | n/a | -0.210 | 0.338 |
| Test scores | 16 | 1 | 60 | 0.217 | 0.251 | 16 | 0.208 | 0.276 | 17 | 0.217 | 0.387 |

[^]WSIPP’s benefit-cost model does not monetize this outcome.

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

Citations Used in the Meta-Analysis

Cook, P.J., Dodge, K., Farkas, G., Fryer, R.G., Guryan, J., Ludwig, J., ... Steinberg, L.. (2014). *The (surprising) efficacy of academic and behavioral intervention with disadvantaged youth: Results from a randomized experiment in Chicago* (NBER Working Paper 19862). Cambridge, MA: National Bureau of Economic Research.

State and district early childhood education programs

Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated December 2013.

Program Description: In this analysis, we include pre-kindergarten programs funded by states or school districts that are universal or that target low-income students. Comparison students could have received any other child care options available in the community, including care by family members, another preschool program, subsidized or unsubsidized child care, or Head Start.

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|----------------------------|------------------|---------------------------------|----------|
| Taxpayers | \$12,989 | Benefit to cost ratio | \$4.63 |
| Participants | \$14,311 | Benefits minus costs | \$26,802 |
| Others | \$7,730 | Chance the program will produce | |
| Indirect | (\$850) | benefits greater than the costs | 83 % |
| Total benefits | \$34,180 | | |
| Net program cost | (\$7,377) | | |
| Benefits minus cost | \$26,802 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|--|-----------------|-----------------|---------------------|-----------------------|-----------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Crime | \$0 | \$1,809 | \$3,983 | \$908 | \$6,700 |
| Labor market earnings associated with high school graduation | \$14,043 | \$6,377 | \$6,444 | \$0 | \$26,864 |
| K-12 grade repetition | \$0 | \$403 | \$0 | \$203 | \$606 |
| K-12 special education | \$0 | \$2,676 | \$0 | \$1,335 | \$4,011 |
| Health care associated with educational attainment | (\$585) | \$2,148 | (\$2,330) | \$1,082 | \$315 |
| Costs of higher education | (\$1,118) | (\$1,317) | (\$367) | (\$662) | (\$3,463) |
| Subtotals | \$12,340 | \$12,096 | \$7,730 | \$2,866 | \$35,032 |
| From secondary participant | | | | | |
| Labor market earnings associated with employment | \$1,970 | \$895 | \$0 | \$0 | \$2,865 |
| Public assistance | \$1 | (\$2) | \$0 | (\$3) | (\$4) |
| Subtotals | \$1,971 | \$893 | \$0 | (\$3) | \$2,861 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$3,713) | (\$3,713) |
| Totals | \$14,311 | \$12,989 | \$7,730 | (\$850) | \$34,180 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

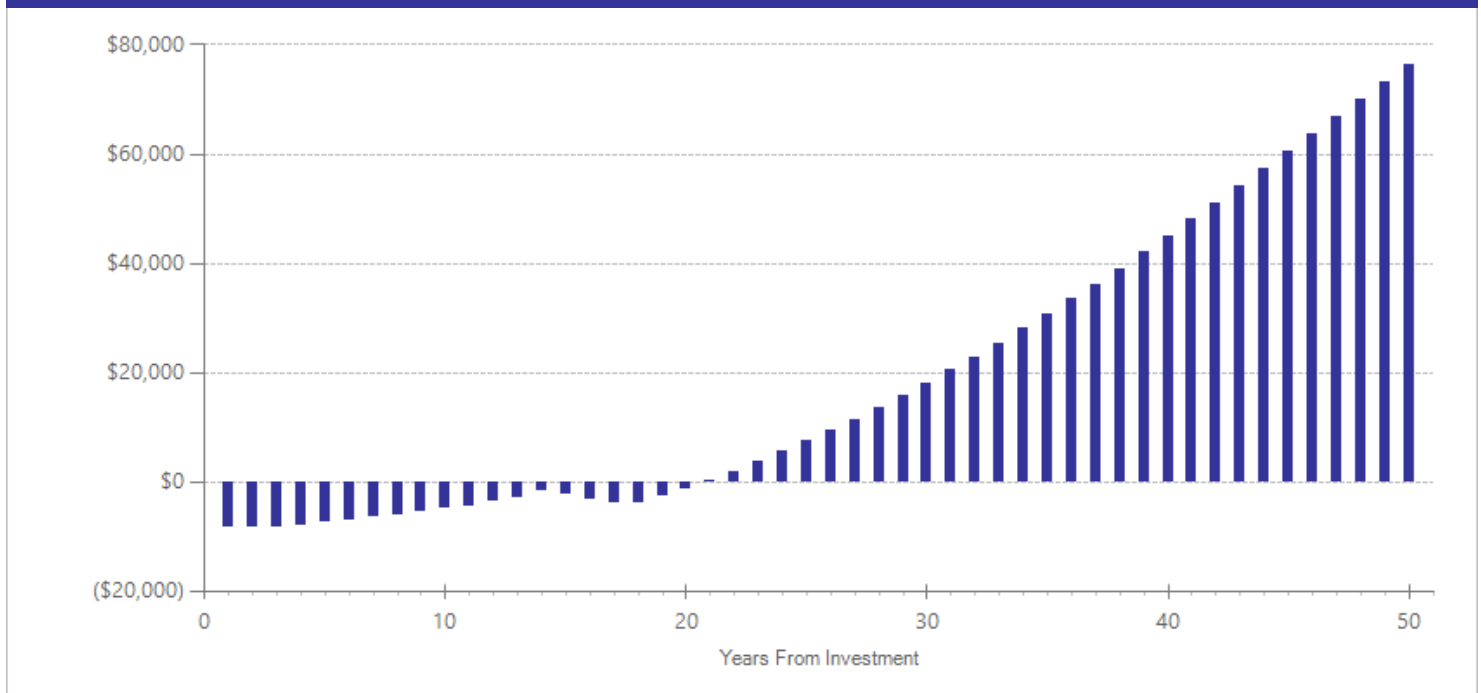
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|-----------|
| Program costs | \$6,934 | 2012 | Present value of net program costs (in 2017 dollars) | (\$7,377) |
| Comparison costs | \$961 | 2012 | Cost range (+ or -) | 10 % |

Our per-participant estimate reflects the total cost of Washington State’s Early Childhood Education and Assistance Program (ECEAP), including administrative costs per slot plus the amount of state-subsidized child care subsidies distributed to kids in ECEAP (http://www.del.wa.gov/publications/partnerships/docs/ECEAP_HS_Profile_2012.pdf). Comparison group costs reflect the range of other options that low-income children in Washington might receive, including state-subsidized child care and Head Start. Comparison group costs were calculated by dividing the amount of state-subsidized child care subsidies distributed to ECEAP-eligible families who did not participate in ECEAP by the number of children (30,936). The number of eligible students includes all Head Start (HS) students; while HS eligibility is up to 130% of the federal poverty line (FPL), students under 100% FPL are given first priority (http://www.del.wa.gov/publications/partnerships/docs/ECEAP_HS_Profile_2012.pdf and personal communication with Nicole Rose, Department of Early Learning, Early Learning Management System on December 4, 2013).

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | Primary or secondary participant | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|------------------------|---------------|----------------------------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | | ES | SE | Age | ES | SE | Age | | |
| Crime | 4 | Primary | 1 | 902 | -0.251 | 0.174 | 26 | -0.251 | 0.174 | 36 | -0.251 | 0.149 |
| High school graduation | 4 | Primary | 2 | 1184 | 0.231 | 0.091 | 21 | 0.231 | 0.091 | 21 | 0.231 | 0.011 |
| K-12 grade repetition | 4 | Primary | 4 | 2023 | -0.351 | 0.068 | 12 | -0.351 | 0.068 | 12 | -0.351 | 0.001 |
| K-12 special education | 4 | Primary | 3 | 1670 | -0.118 | 0.193 | 14 | -0.118 | 0.193 | 14 | -0.118 | 0.544 |
| Test scores | 4 | Primary | 17 | 10799 | 0.303 | 0.029 | 4 | 0.064 | 0.031 | 17 | 0.303 | 0.001 |
| Earnings* | 32 | Secondary | 1 | 5253 | 0.024 | 0.042 | 33 | 0.000 | 0.000 | 34 | 0.024 | 0.566 |
| Employment | 32 | Secondary | 1 | 5253 | -0.003 | 0.017 | 33 | 0.000 | 0.000 | 34 | -0.003 | 0.851 |
| Public assistance | 32 | Secondary | 1 | 5253 | 0.000 | 0.040 | 33 | 0.000 | 0.000 | 34 | 0.000 | 1.000 |

*The effect size for this outcome indicates percentage change, not a standardized mean difference effect size.

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

Citations Used in the Meta-Analysis

- Barnett, W.S., Frede, E.C., Mobasher, H., & Mohr, P. (1988). The efficacy of public preschool programs and the relationship of program quality to efficacy. *Educational Evaluation and Policy Analysis, 10*(1), 37-49.
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Consultant teachers: Literacy Collaborative Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated January 2018.

Program Description: Literacy Collaborative is a comprehensive teacher professional development model that uses coaching for teachers as a primary strategy to improve instructional practices and student outcomes. The program provides up to 35 days of training at university sites to literacy coaches before placement in schools, as well as on-going training and support. Coaches provide professional development and work one-on-one with classroom teachers with a focus on the specific instructional strategies in the Literacy Collaborative model. The evaluation included in this analysis measures the impact of the model on students in grades K–2 after three years of implementation.

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|-------------------------|-----------------|---------------------------------|----------|
| Taxpayers | \$6,985 | Benefit to cost ratio | \$35.61 |
| Participants | \$14,414 | Benefits minus costs | \$26,444 |
| Others | \$5,996 | Chance the program will produce | |
| Indirect | (\$187) | benefits greater than the costs | 100 % |
| <u>Total benefits</u> | <u>\$27,208</u> | | |
| <u>Net program cost</u> | <u>(\$764)</u> | | |
| Benefits minus cost | \$26,444 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|--|-----------------|----------------|---------------------|-----------------------|-----------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Labor market earnings associated with test scores | \$14,521 | \$6,594 | \$6,420 | \$0 | \$27,535 |
| Health care associated with educational attainment | (\$107) | \$391 | (\$424) | \$196 | \$57 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$383) | (\$383) |
| Totals | \$14,414 | \$6,985 | \$5,996 | (\$187) | \$27,208 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²“Others” includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³“Indirect benefits” includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

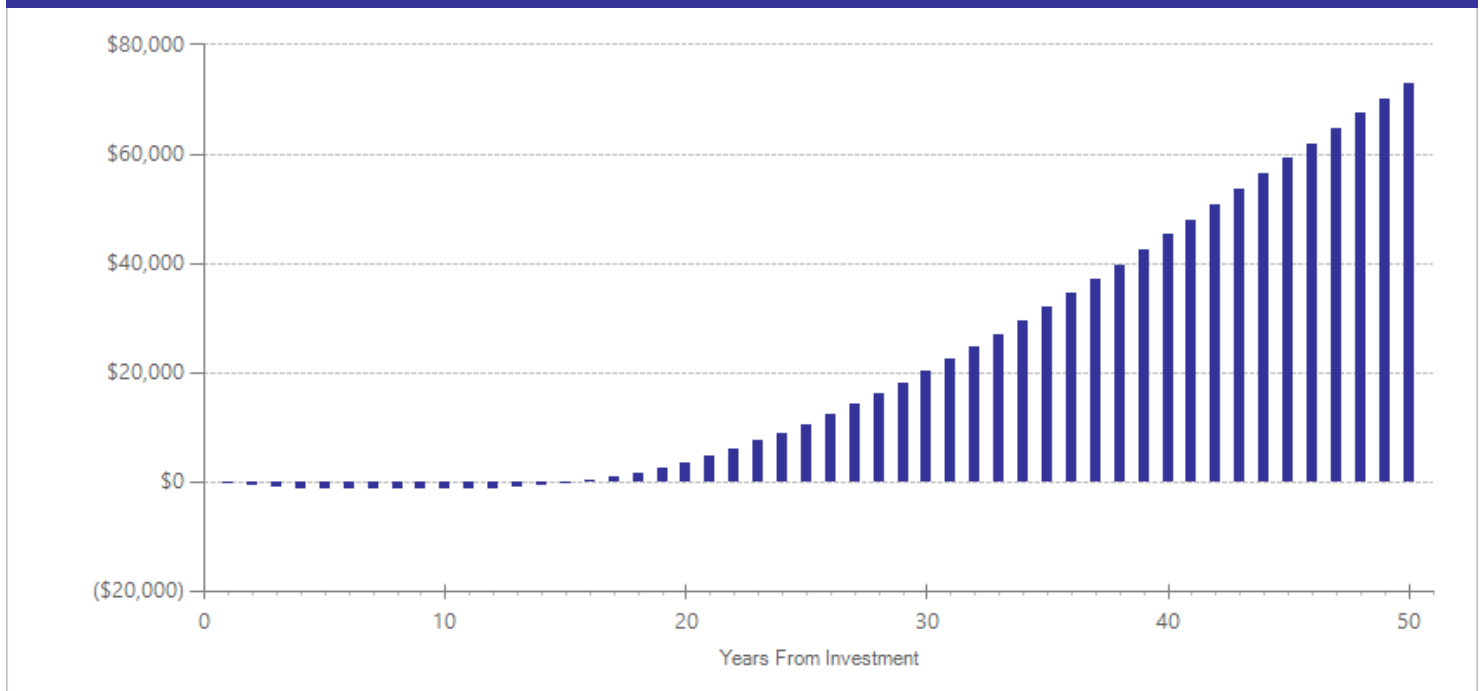
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|---------|
| Program costs | \$192 | 2013 | Present value of net program costs (in 2017 dollars) | (\$764) |
| Comparison costs | \$0 | 2013 | Cost range (+ or -) | 10 % |

Cost is based on published literacy coach training costs, including training fees, travel, and materials, from Ohio State University (2014). *Costs for Literacy Collaborative literacy coach training 2014-2015*, Columbus Ohio, OH: author. The estimate also includes salary costs for coach and teacher time based on the average compensation cost (including benefits) for K-8 teachers as reported by the Office of the Superintendent of Public Instruction. To calculate a per-student annual cost, we used the number of students in grades K-2 in Washington's prototypical schools formula. Costs reflect the average annual cost per-student assuming three years of implementation and one year of training.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|-------------------|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| Test scores | 6 | 1 | 3348 | 0.428 | 0.025 | 6 | 0.171 | 0.028 | 17 | 0.428 | 0.001 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

Citations Used in the Meta-Analysis

Biancarosa, G., Bryk, A.S., & Dexter, E.R. (2010). Assessing the value-added effects of Literacy Collaborative professional development on student learning. *The Elementary School Journal*, 111(1), 7-34.

Double-dose classes

Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated May 2015.

Program Description: Double dose classes are provided to middle and high school students struggling in reading or, more typically, math. Students participating in this intervention enroll in two reading or math classes instead of one, thus doubling their instructional time in these subjects.

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|----------------------------|-----------------|---------------------------------|----------|
| Taxpayers | \$4,651 | Benefit to cost ratio | \$34.10 |
| Participants | \$8,905 | Benefits minus costs | \$16,587 |
| Others | \$3,512 | Chance the program will produce | |
| Indirect | \$21 | benefits greater than the costs | 98 % |
| Total benefits | \$17,088 | | |
| Net program cost | (\$501) | | |
| Benefits minus cost | \$16,587 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|--|----------------|----------------|---------------------|-----------------------|-----------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Crime | \$0 | \$25 | \$61 | \$12 | \$98 |
| Labor market earnings associated with test scores | \$9,046 | \$4,108 | \$4,016 | \$0 | \$17,171 |
| Health care associated with educational attainment | (\$142) | \$518 | (\$565) | \$260 | \$71 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$251) | (\$251) |
| Totals | \$8,905 | \$4,651 | \$3,512 | \$21 | \$17,088 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

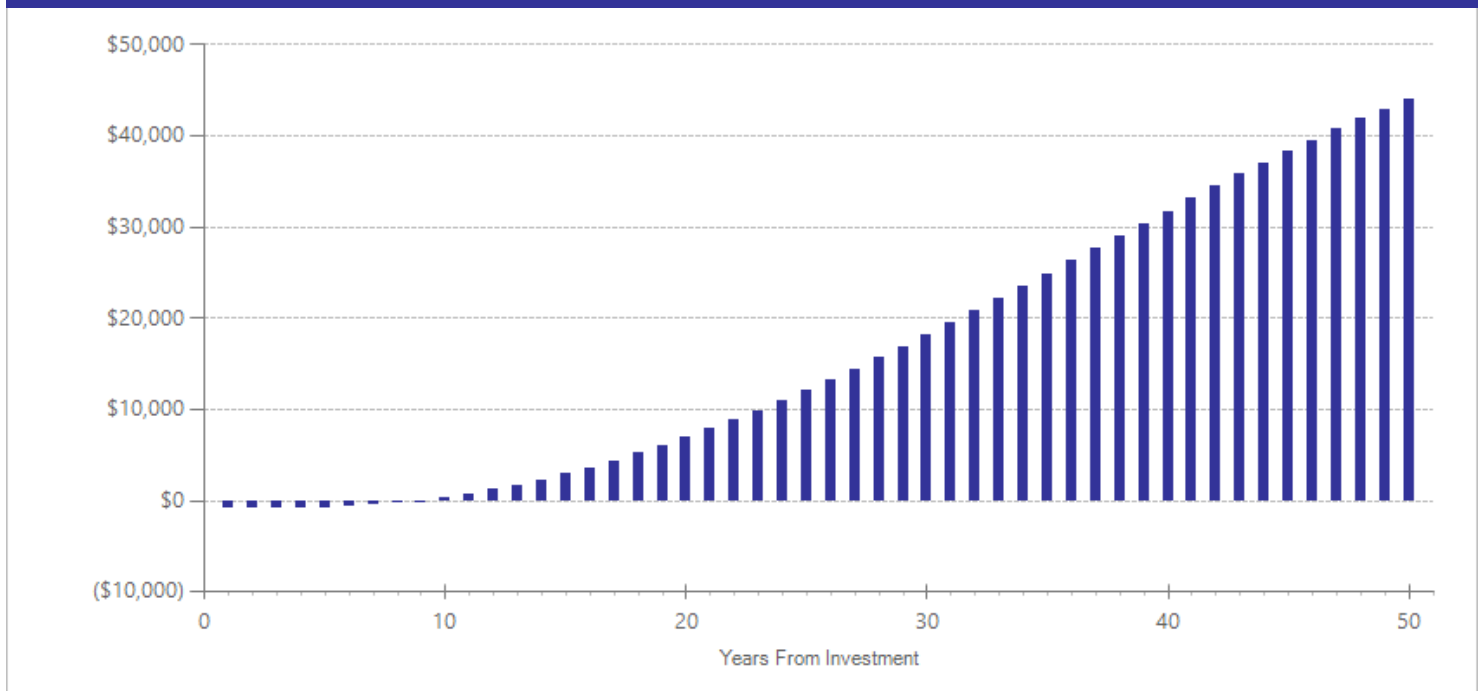
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|---------|
| Program costs | \$479 | 2013 | Present value of net program costs (in 2017 dollars) | (\$501) |
| Comparison costs | \$0 | 2013 | Cost range (+ or -) | 10 % |

In the studies reviewed for this estimate, providing "double dose" classes required hiring approximately 15% more teachers to cover the additional classes (this figure accounts for a partial cost offset from hiring fewer elective course teachers). Teachers were provided with three days of professional development and curriculum materials for implementation. To calculate a per-student annual cost, we used average Washington State compensation costs (including benefits) for teachers as reported by the Office of the Superintendent of Public Instruction and add per-student curriculum and teacher training costs.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the "break-even" point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|------------------------|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| High school graduation | 13 | 2 | 10463 | 0.045 | 0.022 | 18 | 0.045 | 0.022 | 18 | 0.045 | 0.040 |
| Test scores | 13 | 5 | 30857 | 0.093 | 0.041 | 13 | 0.093 | 0.041 | 17 | 0.093 | 0.023 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

Citations Used in the Meta-Analysis

- Bartik, T.J., & Lachowska, M. (2014). *The effects of doubling instruction efforts on middle school students' achievement: Evidence from a multiyear regression-discontinuity design* (Working Paper 14-205). Kalamazoo, MI: W.E. Upjohn Institute for Employment Research.
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Tutoring: By peers Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated July 2014.

Program Description: Generally, peer tutoring is an instructional strategy that uses students to provide academic assistance to struggling peers. Peer tutoring may use students from the same classrooms or pair older students with younger struggling students. Tutoring assistance can occur through one-on-one interactions or in small groups and in some instances students alternate between the role of tutor and tutee. The specific types of peer tutoring that have been evaluated and are included in this meta-analysis are (in no particular order) ClassWide Peer Tutoring, Peer-Assisted Learning Strategies, and Reciprocal Peer Tutoring. The evaluated tutoring programs in this analysis provide, on average, about 30 hours of peer tutoring time each year and about six hours of training time for teachers and students to learn program procedures.

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|----------------------------|-----------------|---------------------------------|----------|
| Taxpayers | \$4,066 | Benefit to cost ratio | \$137.88 |
| Participants | \$8,397 | Benefits minus costs | \$15,910 |
| Others | \$3,509 | Chance the program will produce | |
| Indirect | \$54 | benefits greater than the costs | 83 % |
| Total benefits | \$16,026 | | |
| Net program cost | (\$116) | | |
| Benefits minus cost | \$15,910 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|--|----------------|----------------|---------------------|-----------------------|-----------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Labor market earnings associated with test scores | \$8,458 | \$3,841 | \$3,754 | \$0 | \$16,054 |
| Health care associated with educational attainment | (\$61) | \$225 | (\$245) | \$113 | \$31 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$58) | (\$58) |
| Totals | \$8,397 | \$4,066 | \$3,509 | \$54 | \$16,026 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

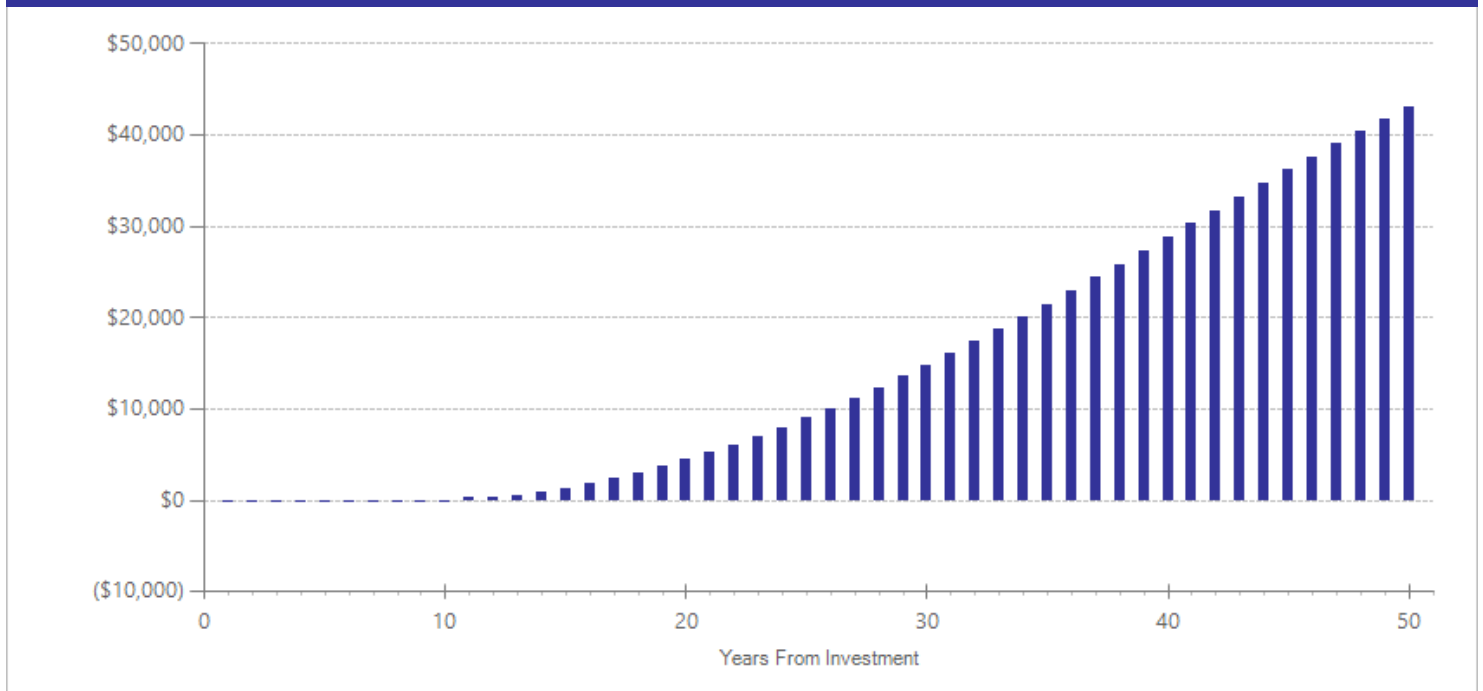
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|---------|
| Program costs | \$111 | 2013 | Present value of net program costs (in 2017 dollars) | (\$116) |
| Comparison costs | \$0 | 2013 | Cost range (+ or -) | 10 % |

In the evaluations included in this meta-analysis, the average peer tutoring program provides 30 hours tutoring time and six hours of training time per class. To calculate a per-student annual cost, we used average Washington State compensation costs (including benefits) for a K-8 teacher as reported by the Office of the Superintendent of Public Instruction, divided by the number of students per classroom in Washington's prototypical schools formula.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|-------------------|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| Test scores | 9 | 8 | 400 | 0.159 | 0.090 | 9 | 0.095 | 0.099 | 17 | 0.334 | 0.002 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

Citations Used in the Meta-Analysis

- Dion, E., Roux, C., Landry, D., Fuchs, D., Wehby, J., & Dupere, V. (2011). Improving attention and preventing reading difficulties among low-income first-graders: A randomized study. *Prevention Science, 12*(1), 70-79.
- Fuchs, D., Fuchs, L. S., Mathes, P. G., & Simmons, D. C. (1997). Peer-assisted learning strategies: Making classrooms more responsive to diversity. *American Educational Research Journal, 34*(1), 174-206.
- Fuchs, L., Fuchs, D., & Kazdan, S. (1999). Effects of peer-assisted learning strategies on high school students with serious reading problems. *Remedial and Special Education, 20*(5), 309-318.
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- Trovato, J., & Bucher, B. (1980). Peer tutoring with or without home-based reinforcement, for reading remediation. *Journal of Applied Behavior Analysis, 13*(1), 129-41.

Summer book programs: Multi-year intervention Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated February 2018.

Program Description: The summer book program included in this analysis provides 12 free books to elementary students each year for three consecutive years. The program focuses on early elementary students in 1st and 2nd grade. The main goal is to increase book access and voluntary summer reading for children from low-income families. Students self-select books each year at a book fair. The available books are screened for text difficulty. The studies included in this analysis measure the program's impact after three years.

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|----------------------------|-----------------|---------------------------------|----------|
| Taxpayers | \$3,984 | Benefit to cost ratio | \$70.51 |
| Participants | \$8,234 | Benefits minus costs | \$15,400 |
| Others | \$3,405 | Chance the program will produce | |
| Indirect | (\$2) | benefits greater than the costs | 70 % |
| Total benefits | \$15,621 | | |
| Net program cost | (\$222) | | |
| Benefits minus cost | \$15,400 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|--|----------------|----------------|---------------------|-----------------------|-----------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Labor market earnings associated with test scores | \$8,294 | \$3,766 | \$3,643 | \$0 | \$15,703 |
| Health care associated with educational attainment | (\$60) | \$218 | (\$238) | \$109 | \$29 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$111) | (\$111) |
| Totals | \$8,234 | \$3,984 | \$3,405 | (\$2) | \$15,621 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

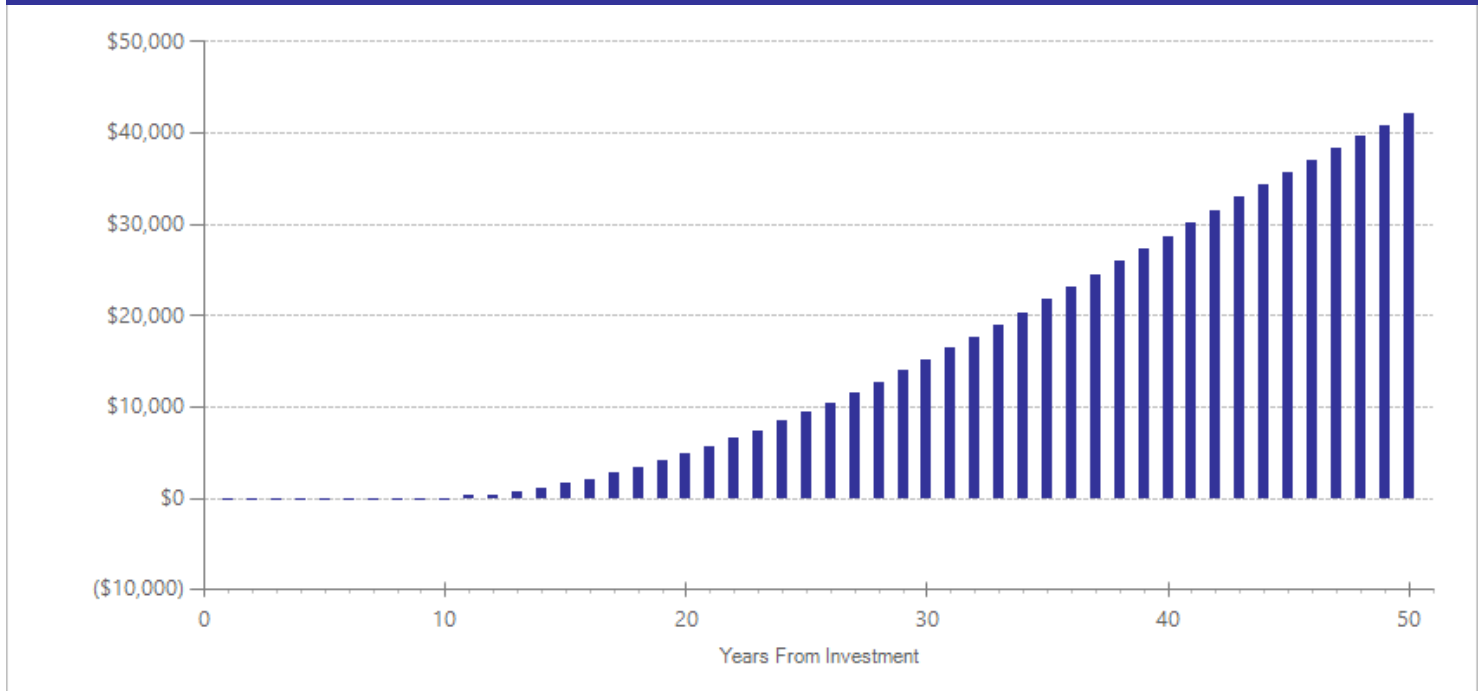
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|---------|
| Program costs | \$73 | 2013 | Present value of net program costs (in 2017 dollars) | (\$222) |
| Comparison costs | \$0 | 2013 | Cost range (+ or -) | 10 % |

These multi-year interventions typically run for three years. To calculate a per-student annual cost, we use average Washington State compensation costs (including benefits) for a K–8 teacher as reported by the Office of the Superintendent of Public Instruction to account for the time it takes teachers to administer the program divided by the average number of students per classroom in Washington's prototypical schools formula. In addition to compensation, the estimate accounts for the cost of purchasing 12 books per student each year.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|-------------------|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| Test scores | 10 | 1 | 852 | 0.138 | 0.147 | 10 | 0.091 | 0.162 | 17 | 0.138 | 0.346 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

Citations Used in the Meta-Analysis

Allington, R.L., McGill-Franzen, A., Camilli, G., Williams, L., Graff, J., Zeig, J., . . . Nowak, R. (2010). Addressing summer reading setback among economically disadvantaged elementary students. *Reading Psychology, 31*(5), 411-27.

Teacher professional development: Use of data to guide instruction

Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated June 2014.

Program Description: One form of teacher professional development (PD) involves training teachers how to use student academic assessment data to modify and improve instruction. This type of PD is usually paired with computer software that tracks and reports student assessment data to teachers. The specific types of assessments and software that have been evaluated and are included in this meta-analysis are (in no particular order) ISI (Individualized Student Instruction) using A2i software, Data-Driven District (3D), mCLASS/Acuity, Looking at Student Work, Formative Assessments of Student Thinking in Reading (FAST-R), and 4sight.

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|----------------------------|-----------------|---------------------------------|----------|
| Taxpayers | \$3,706 | Benefit to cost ratio | \$130.44 |
| Participants | \$7,653 | Benefits minus costs | \$14,492 |
| Others | \$3,199 | Chance the program will produce | |
| Indirect | \$46 | benefits greater than the costs | 99 % |
| Total benefits | \$14,604 | | |
| Net program cost | (\$112) | | |
| Benefits minus cost | \$14,492 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|--|----------------|----------------|---------------------|-----------------------|-----------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Labor market earnings associated with test scores | \$7,709 | \$3,501 | \$3,422 | \$0 | \$14,632 |
| Health care associated with educational attainment | (\$56) | \$205 | (\$223) | \$102 | \$28 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$56) | (\$56) |
| Totals | \$7,653 | \$3,706 | \$3,199 | \$46 | \$14,604 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

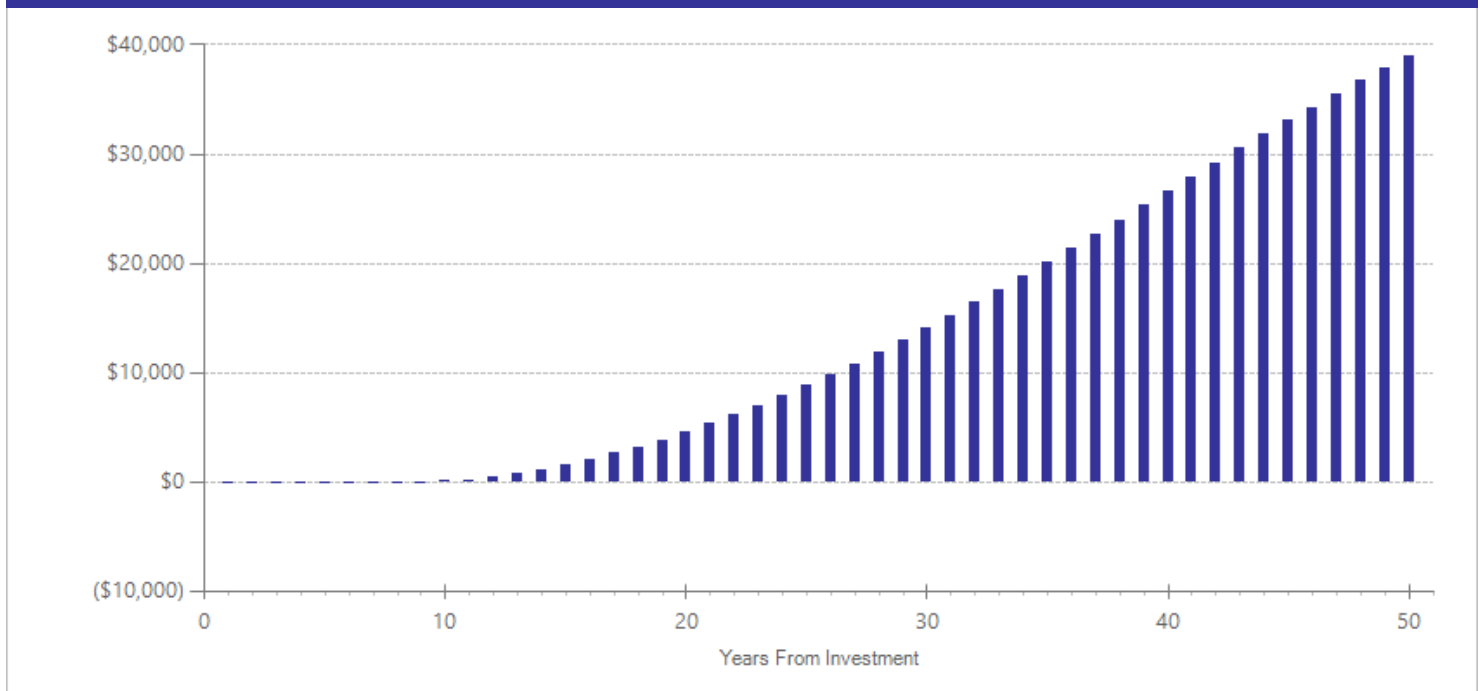
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|---------|
| Program costs | \$107 | 2013 | Present value of net program costs (in 2017 dollars) | (\$112) |
| Comparison costs | \$0 | 2013 | Cost range (+ or -) | 10 % |

In the evaluations included in the meta-analysis, teachers received an average of 26 hours of training in how to use student assessment data to guide instruction. We calculated the value of PD time using average teacher salaries (including benefits) in Washington State as reported by the Office of Superintendent of Public Instruction. To calculate a per-student annual cost, we divided compensation costs by the number of students per classroom in Washington's prototypical schools formula and add per-student materials, supplies, and operating costs to account for the overhead (i.e. facility, computer, and administrative costs) associated with providing PD.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|-------------------|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| Test scores | 10 | 10 | 10541 | 0.117 | 0.035 | 11 | 0.084 | 0.038 | 17 | 0.190 | 0.001 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

Citations Used in the Meta-Analysis

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Tutoring: By adults for English language learner students

Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated July 2014.

Program Description: In this analysis, we include studies that compared one-on-one tutoring programs for English Language Learner (ELL) students, with regular classroom reading instruction without supplemental tutoring.

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|----------------------|----------------|---------------------------------|----------|
| Taxpayers | \$4,322 | Benefit to cost ratio | \$10.74 |
| Participants | \$8,661 | Benefits minus costs | \$14,433 |
| Others | \$3,503 | Chance the program will produce | |
| Indirect | (\$570) | benefits greater than the costs | 68 % |
| <hr/> Total benefits | <hr/> \$15,915 | | |
| Net program cost | (\$1,482) | | |
| Benefits minus cost | \$14,433 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|--|---------------|---------------|---------------------|-----------------------|----------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Labor market earnings associated with test scores | \$8,755 | \$3,976 | \$3,879 | \$0 | \$16,610 |
| Health care associated with educational attainment | (\$94) | \$346 | (\$377) | \$174 | \$49 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$744) | (\$744) |
| <hr/> Totals | <hr/> \$8,661 | <hr/> \$4,322 | <hr/> \$3,503 | <hr/> (\$570) | <hr/> \$15,915 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

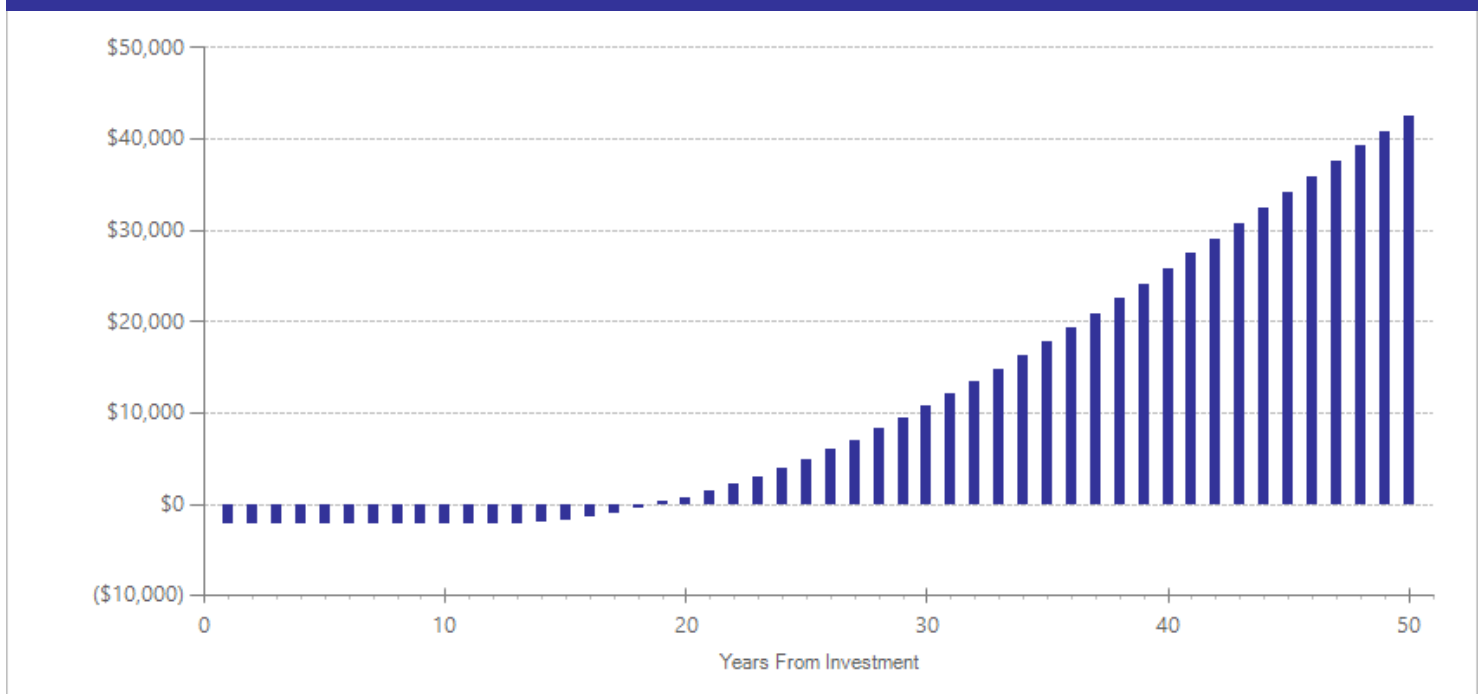
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|-----------|
| Program costs | \$2,612 | 2009 | Present value of net program costs (in 2017 dollars) | (\$1,482) |
| Comparison costs | \$1,298 | 2009 | Cost range (+ or -) | 20 % |

Per-participant cost estimates are based on the following assumptions derived from the programs described in the studies included in the meta-analysis: on average, the programs lasted for 4.5 months, with 60 tutoring sessions of about 25 minutes each. The programs provided one to three hours of teacher training. We used average teacher salaries (including benefits) in Washington State to compute the value of tutors' time. We assumed that tutoring costs are in addition to regular classroom instruction, for which the cost estimate reflects the sum of local, state, and federal dollars allocated per-student (averaged across Washington State school districts) for the 2008-09 school year. We estimated the uncertainty around the cost estimate at 20%. Source for dollars allocated per student from Washington's Office of Superintendent of Public Instruction.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|-------------------|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| Test scores | 6 | 4 | 114 | 0.155 | 0.163 | 10 | 0.102 | 0.179 | 17 | 0.183 | 0.264 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

Citations Used in the Meta-Analysis

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Tutoring: By certificated teachers, small-group, structured Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated June 2014.

Program Description: The programs included in this analysis are structured, systematic approaches to tutoring small-groups of struggling students in grades K–6 in specific English language arts and/or mathematics skills. The evaluated programs include a variety of specific approaches and curricula such as (in no particular order) Read Aloud, Proactive Reading, Responsive Reading, Leveled Literacy, Spell Read, Corrective Reading, and Number Rockets. An average program provides about 40 hours of tutoring time to groups of two to six (usually three) early elementary students. Certificated teachers provide tutoring and receive about 35 hours of training with a focus on the specific content and strategies used in the programs.

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|-------------------------|------------------|---------------------------------|----------|
| Taxpayers | \$4,100 | Benefit to cost ratio | \$10.51 |
| Participants | \$8,461 | Benefits minus costs | \$13,991 |
| Others | \$3,526 | Chance the program will produce | |
| Indirect | (\$625) | benefits greater than the costs | 97 % |
| <u>Total benefits</u> | <u>\$15,462</u> | | |
| <u>Net program cost</u> | <u>(\$1,471)</u> | | |
| Benefits minus cost | \$13,991 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|--|----------------|----------------|---------------------|-----------------------|-----------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Labor market earnings associated with test scores | \$8,524 | \$3,871 | \$3,775 | \$0 | \$16,169 |
| Health care associated with educational attainment | (\$62) | \$229 | (\$249) | \$115 | \$33 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$741) | (\$741) |
| Totals | \$8,461 | \$4,100 | \$3,526 | (\$625) | \$15,462 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

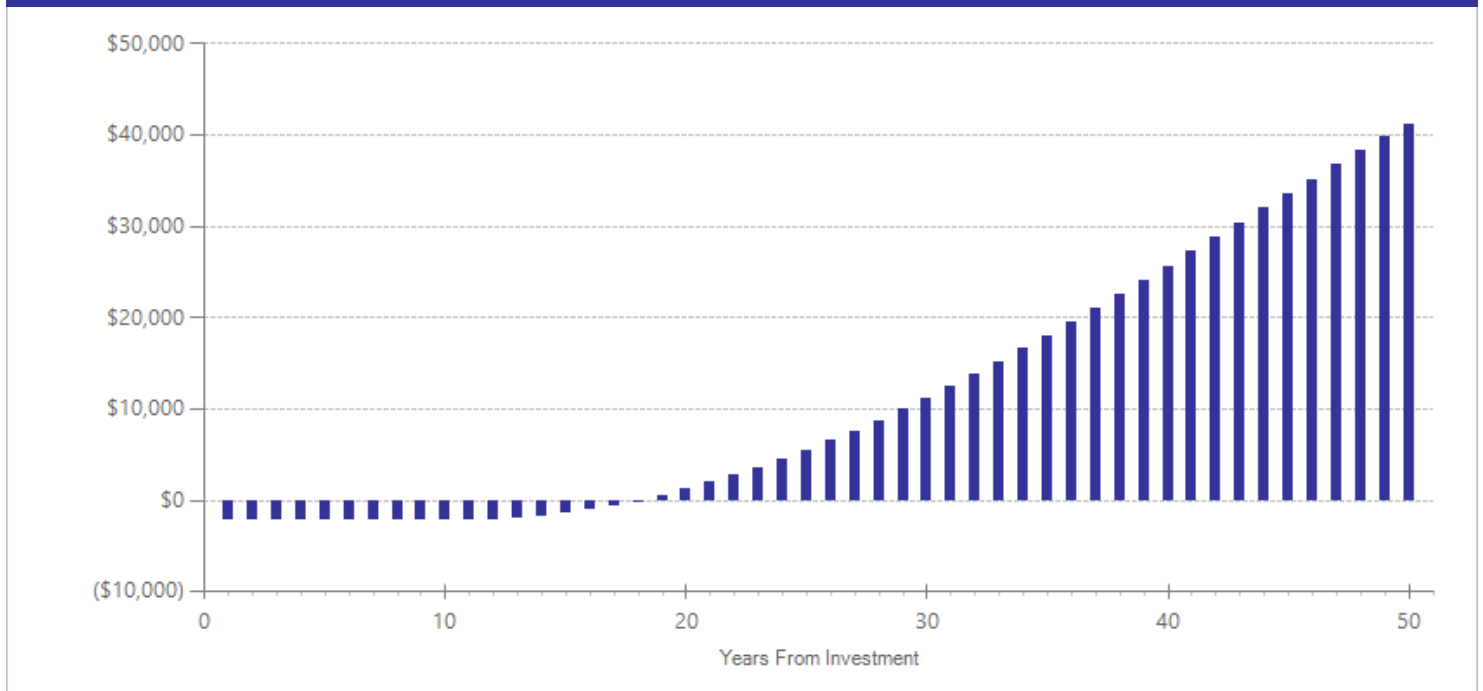
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|-----------|
| Program costs | \$1,406 | 2013 | Present value of net program costs (in 2017 dollars) | (\$1,471) |
| Comparison costs | \$0 | 2013 | Cost range (+ or -) | 10 % |

In the evaluations included in this meta-analysis, a certificated teacher provides, on average, 40 hours of tutoring to nine students per year in groups of three and receives 35 hours of training. To calculate a per-student annual cost, we used average Washington State compensation costs (including benefits) for a K-8 teacher as reported by the Office of the Superintendent of Public Instruction, divided by the total number of students served.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|-------------------|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| Test scores | 7 | 14 | 1649 | 0.209 | 0.039 | 7 | 0.098 | 0.043 | 17 | 0.254 | 0.001 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

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Consultant teachers: Online coaching Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated June 2014.

Program Description: Online coaching programs provide professional development support and feedback to classroom teachers in a web-based environment. The program included in this analysis (My Teaching Partner—Secondary) provides teachers with feedback and guidance on methods to improve their interactions with students. In the online coaching program, teachers upload video recordings of class sessions twice per month. Trained teacher consultants review the recordings and provide feedback to teachers online and over the phone.

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|----------------------------|-----------------|---------------------------------|----------|
| Taxpayers | \$3,314 | Benefit to cost ratio | \$64.53 |
| Participants | \$6,850 | Benefits minus costs | \$12,810 |
| Others | \$2,858 | Chance the program will produce | |
| Indirect | (\$10) | benefits greater than the costs | 93 % |
| Total benefits | \$13,011 | | |
| Net program cost | (\$202) | | |
| Benefits minus cost | \$12,810 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|--|----------------|----------------|---------------------|-----------------------|-----------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Labor market earnings associated with test scores | \$6,899 | \$3,133 | \$3,055 | \$0 | \$13,088 |
| Health care associated with educational attainment | (\$49) | \$180 | (\$197) | \$90 | \$24 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$101) | (\$101) |
| Totals | \$6,850 | \$3,314 | \$2,858 | (\$10) | \$13,011 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²“Others” includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³“Indirect benefits” includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

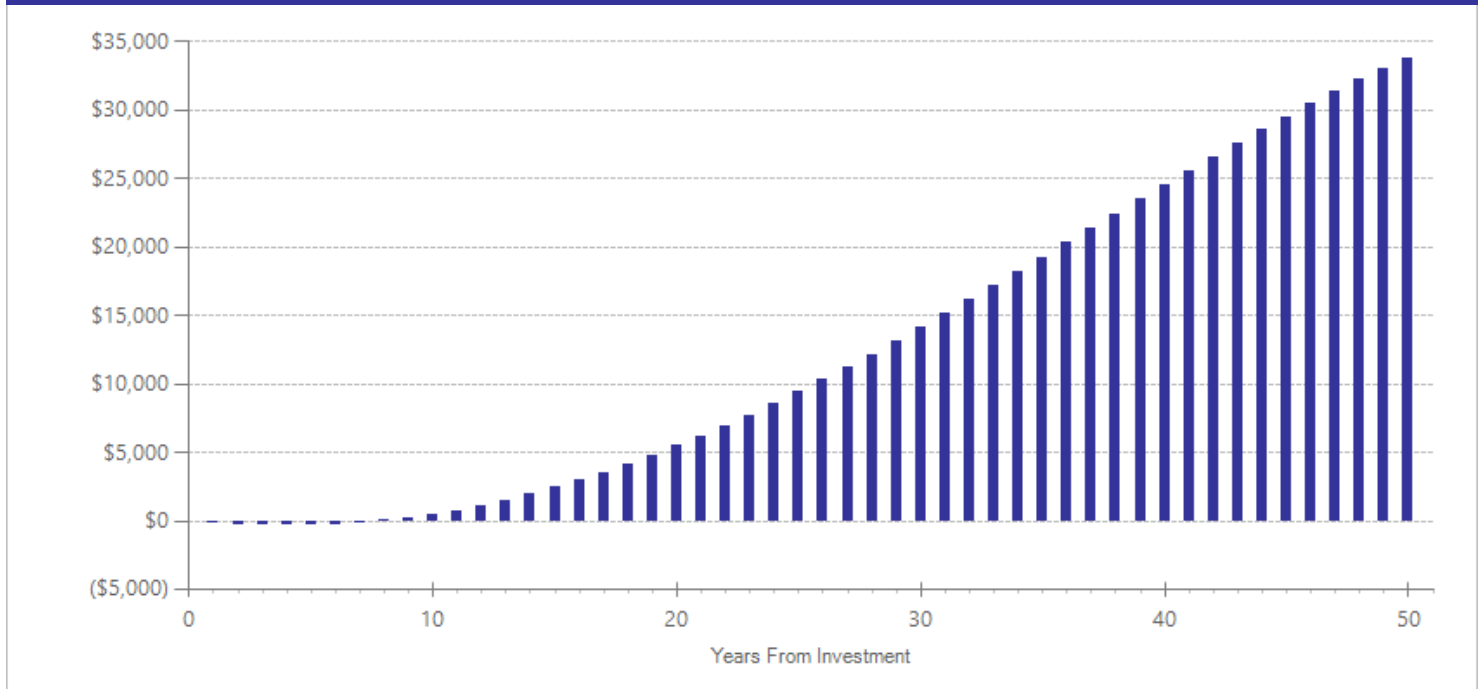
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|---------|
| Program costs | \$98 | 2013 | Present value of net program costs (in 2017 dollars) | (\$202) |
| Comparison costs | \$0 | 2013 | Cost range (+ or -) | 10 % |

In the evaluation included this analysis, teachers participated in an average of 20 hours of training and coaching time. We calculated the value of staff time using average Washington State compensation costs (including benefits) for teachers as reported by the Office of the Superintendent of Public Instruction. We added additional costs reported in the evaluation to account for consultant time and video equipment. To calculate a per-student annual cost, we used the average number of students per classroom in Washington's prototypical schools formula.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|-------------------|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| Test scores | 13 | 2 | 1078 | 0.082 | 0.043 | 14 | 0.071 | 0.048 | 17 | 0.190 | 0.001 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

Citations Used in the Meta-Analysis

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Tutoring: By adults, one-on-one, structured Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated June 2014.

Program Description: The programs included in this analysis are structured, systematic approaches to tutoring struggling students in specific English language arts and/or mathematics skills. They include a variety of specific programs and curricula such as (in no particular order) Reading Recovery, Mathematics Recovery, Edmark Reading Program, Howard Street Tutoring, and Early Intervention Program. The programs typically serve early elementary school students and provide, on average, about 30 hours of tutoring time to an individual student each year. Tutors are typically certificated teachers or specially trained adults (e.g. instructional aides and community volunteers). Tutors receive approximately ten hours of training per year with a focus on the specific content and general tutoring strategies.

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|----------------------------|------------------|---------------------------------|----------|
| Taxpayers | \$4,091 | Benefit to cost ratio | \$6.24 |
| Participants | \$8,441 | Benefits minus costs | \$12,554 |
| Others | \$3,507 | Chance the program will produce | |
| Indirect | (\$1,089) | benefits greater than the costs | 95 % |
| Total benefits | \$14,950 | | |
| Net program cost | (\$2,397) | | |
| Benefits minus cost | \$12,554 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|--|----------------|----------------|---------------------|-----------------------|-----------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Labor market earnings associated with test scores | \$8,504 | \$3,862 | \$3,756 | \$0 | \$16,122 |
| Health care associated with educational attainment | (\$63) | \$230 | (\$249) | \$115 | \$33 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$1,205) | (\$1,205) |
| Totals | \$8,441 | \$4,091 | \$3,507 | (\$1,089) | \$14,950 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

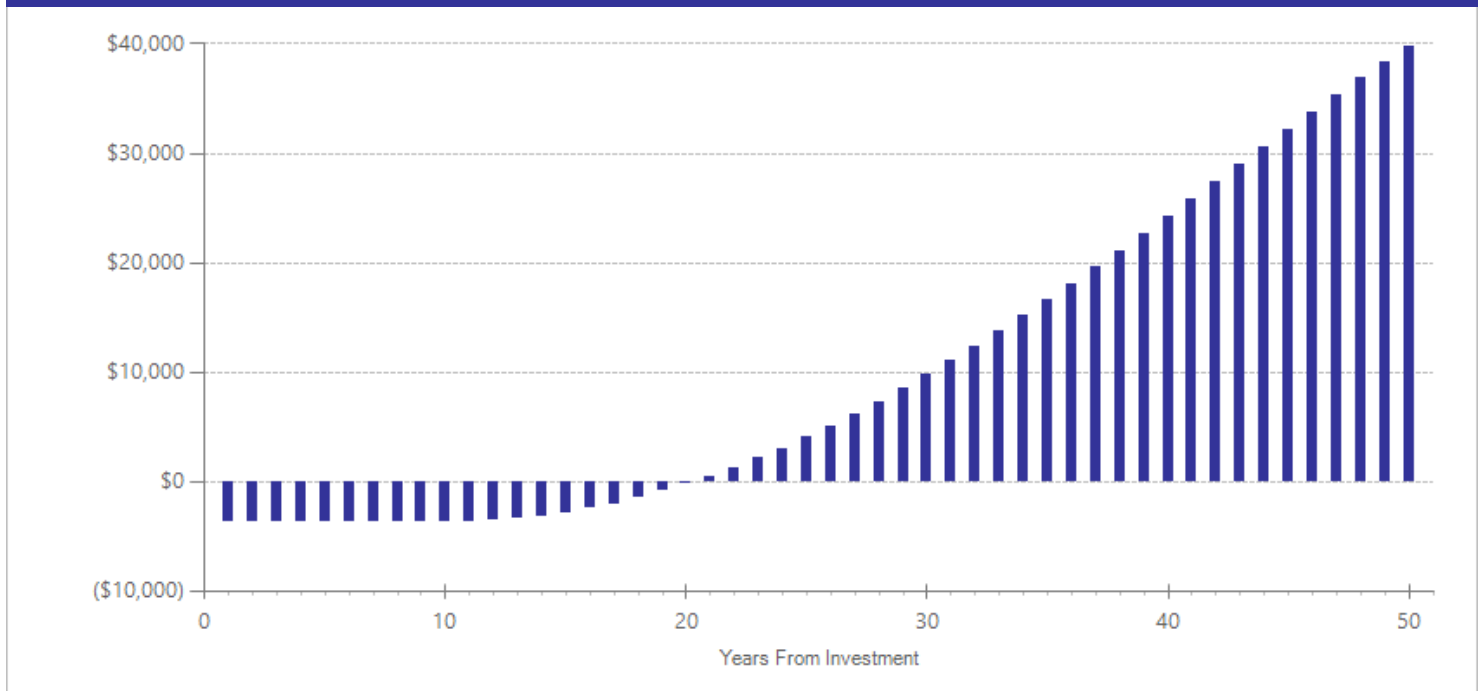
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|-----------|
| Program costs | \$2,291 | 2013 | Present value of net program costs (in 2017 dollars) | (\$2,397) |
| Comparison costs | \$0 | 2013 | Cost range (+ or -) | 10 % |

In the evaluations included in the meta-analysis, the average structured one-on-one tutoring program provides 30 hours of intervention per student and ten hours of training time per tutor. The estimates assume that both certificated teachers and other adults (e.g. instructional aides) provide tutoring. To calculate a per-student annual cost, we used average Washington State compensation costs (including benefits) for K-8 teachers and instructional aides as reported by the Office of the Superintendent of Public Instruction.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|-------------------|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| Test scores | 7 | 23 | 2097 | 0.211 | 0.038 | 7 | 0.099 | 0.042 | 17 | 0.508 | 0.001 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

Citations Used in the Meta-Analysis

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Project Lead The Way (PLTW)

Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated September 2014.

Program Description: Project Lead the Way (PLTW) is an example of project-based learning focused on science, technology, engineering, and mathematics (STEM) education. PLTW is a nonprofit organization that develops engineering courses for high schools and middle schools and biomedical sciences courses for high schools. The curriculum is delivered through an online “virtual academy.” Computer software and classroom materials for hands-on activities, as well as required teacher training, are the main costs related to the program. We present the findings for math scores here.

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|----------------------------|------------------|---------------------------------|----------|
| Taxpayers | \$3,809 | Benefit to cost ratio | \$7.76 |
| Participants | \$7,874 | Benefits minus costs | \$12,335 |
| Others | \$3,290 | Chance the program will produce | |
| Indirect | (\$812) | benefits greater than the costs | 82 % |
| Total benefits | \$14,162 | | |
| Net program cost | (\$1,826) | | |
| Benefits minus cost | \$12,335 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|--|----------------|----------------|---------------------|-----------------------|-----------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Labor market earnings associated with test scores | \$7,931 | \$3,602 | \$3,516 | \$0 | \$15,049 |
| Health care associated with educational attainment | (\$57) | \$208 | (\$226) | \$104 | \$29 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$917) | (\$917) |
| Totals | \$7,874 | \$3,809 | \$3,290 | (\$812) | \$14,162 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²“Others” includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³“Indirect benefits” includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

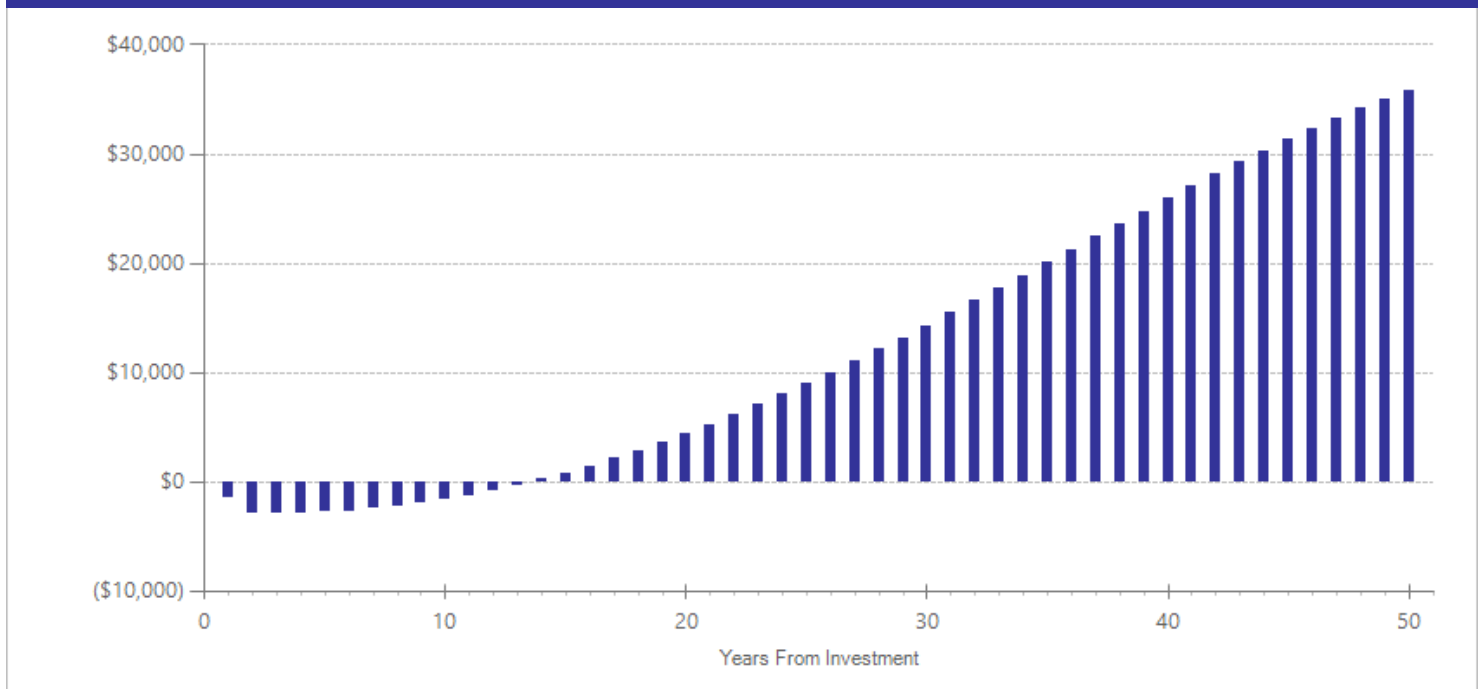
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|-----------|
| Program costs | \$887 | 2013 | Present value of net program costs (in 2017 dollars) | (\$1,826) |
| Comparison costs | \$0 | 2013 | Cost range (+ or -) | 10 % |

The per-student cost estimate assumes that a participating school would offer four sections of PLTW per year with no more than 20 students per class. Students in the evaluated studies typically participated for two years. We calculate the value of teacher time to participate in training and teach courses using average teacher salaries (including benefits) in Washington State as reported by the Office of Superintendent of Public Instruction. The estimate includes an annual participation fee, training costs, and supply costs for course set-up and consumable materials obtained from PLTW (<https://www.pltw.org/get-involved/register-pltw/program-support/equipment-and-supplies>).

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|-------------------|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| Test scores | 14 | 5 | 9319 | 0.084 | 0.060 | 16 | 0.081 | 0.066 | 17 | 0.084 | 0.160 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

Citations Used in the Meta-Analysis

Northwest Evaluation Association. (2010). *Project Lead the Way - Initial Program Evaluation*. Portland, OR.

Rethwisch, D.G., Haynes, M.C., Starobin, S.S., Laanan, F.S., & Schenk, J.T. (2012). Proceedings from Asee Annual Conference and Exposition. *A study of the impact of Project Lead the Way on achievement outcomes in Iowa*. San Antonio, TX.

Tran, N.A., & Nathan, M.J. (2010). Pre-college engineering studies: An investigation of the relationship between pre-college engineering studies and student achievement in science and mathematics. *Journal of Engineering Education*, 99(2): 143- 157.

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Special literacy instruction for English language learner students

Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated July 2014.

Program Description: English-based literacy programs in these evaluations involve a structured, direct instruction approach to teaching reading to English language learner (ELL) students. Some programs include multimedia components such as computer-based instruction. These programs are compared with literacy instruction-as-usual after about three years of schooling. Instruction is provided in a classroom setting during the regular school day.

Benefit-Cost Summary Statistics Per Participant

Benefits to:

| | | | |
|----------------------|----------------|---------------------------------|----------|
| Taxpayers | \$2,945 | Benefit to cost ratio | \$36.67 |
| Participants | \$5,905 | Benefits minus costs | \$10,905 |
| Others | \$2,395 | Chance the program will produce | |
| Indirect | (\$35) | benefits greater than the costs | 81 % |
| <hr/> Total benefits | <hr/> \$11,211 | | |
| Net program cost | (\$306) | | |
| Benefits minus cost | \$10,905 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to:¹

Benefits to:

| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
|--|---------------|---------------|---------------------|-----------------------|----------------|
| Labor market earnings associated with test scores | \$5,969 | \$2,711 | \$2,651 | \$0 | \$11,330 |
| Health care associated with educational attainment | (\$64) | \$235 | (\$255) | \$117 | \$32 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$152) | (\$152) |
| <hr/> Totals | <hr/> \$5,905 | <hr/> \$2,945 | <hr/> \$2,395 | <hr/> (\$35) | <hr/> \$11,211 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

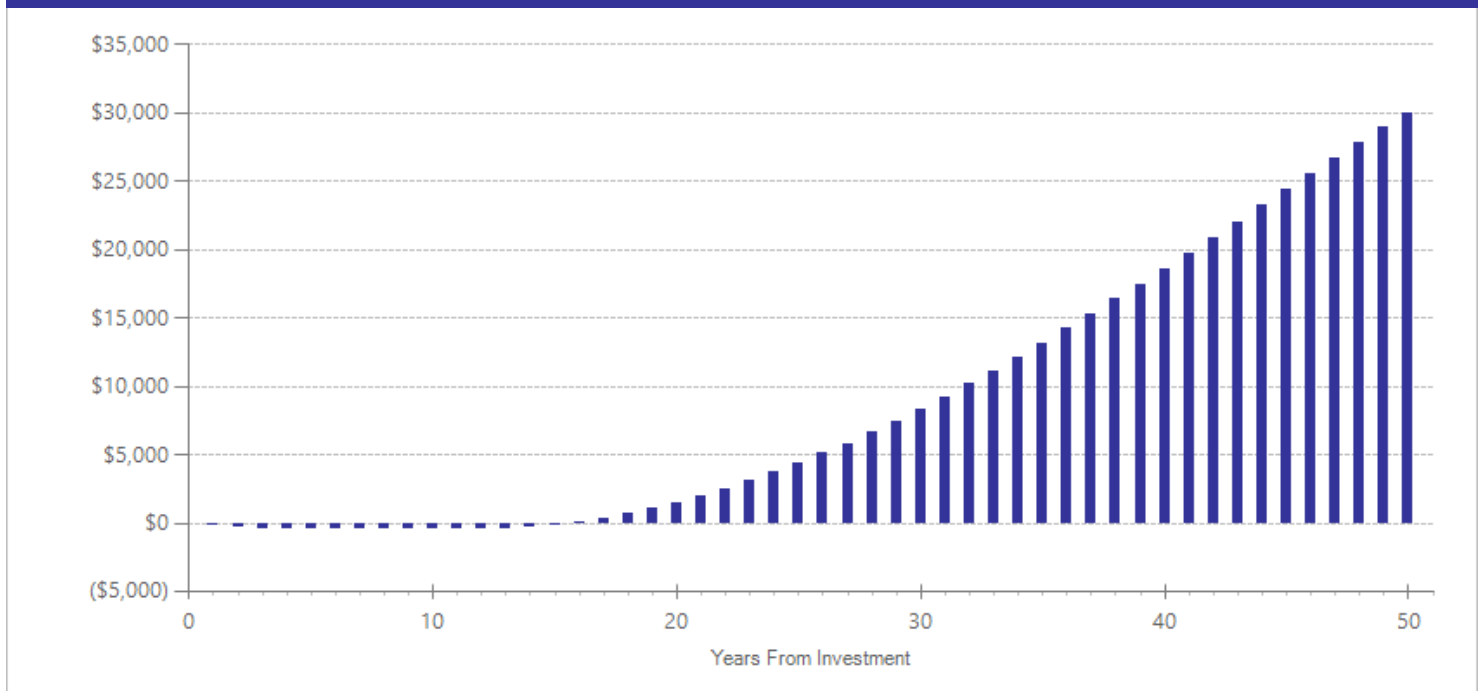
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|---------|
| Program costs | \$1,398 | 2009 | Present value of net program costs (in 2017 dollars) | (\$306) |
| Comparison costs | \$1,298 | 2009 | Cost range (+ or -) | 20 % |

The per-participant cost estimate reflects the sum of local, state, and federal dollars allocated per student (averaged across Washington State school districts) for the 2008-09 school year. All students who qualify for the state Transitional Bilingual Instructional Program (TBIP) receive some form of services, so the comparison group's general instructional costs are the same as for the program group. Because specialized literacy programs may require supplemental materials and training, we added \$100 to the cost estimate and estimated the uncertainty around the cost estimate at 20%. Source for dollars allocated per student come from Washington's Office of Superintendent of Public Instruction.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the "break-even" point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|-------------------|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| Test scores | 6 | 6 | 423 | 0.148 | 0.069 | 7 | 0.070 | 0.076 | 17 | 0.306 | 0.001 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

Citations Used in the Meta-Analysis

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Consultant teachers: Content-Focused Coaching Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated January 2018.

Program Description: Content-Focused Coaching is a professional development model that provides structured training to administrators, coaches, and teachers in order to improve instructional practices and student outcomes. The program provides training for school coaches and principals led by staff from the University of Pittsburgh's Institute for Learning. Coaches, in turn, provide professional development and one-on-one feedback to classroom teachers with a focus on specific reading comprehension strategies. The evaluation included in this analysis compared the effects of Content-Focused Coaching to coaching-as-usual.

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|-------------------------|-----------------|---------------------------------|----------|
| Taxpayers | \$2,773 | Benefit to cost ratio | \$183.73 |
| Participants | \$5,729 | Benefits minus costs | \$10,892 |
| Others | \$2,403 | Chance the program will produce | |
| Indirect | \$47 | benefits greater than the costs | 94 % |
| <u>Total benefits</u> | <u>\$10,952</u> | | |
| <u>Net program cost</u> | <u>(\$60)</u> | | |
| Benefits minus cost | \$10,892 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|--|----------------|----------------|---------------------|-----------------------|-----------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Labor market earnings associated with test scores | \$5,771 | \$2,621 | \$2,569 | \$0 | \$10,960 |
| Health care associated with educational attainment | (\$42) | \$152 | (\$166) | \$77 | \$22 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$30) | (\$30) |
| Totals | \$5,729 | \$2,773 | \$2,403 | \$47 | \$10,952 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

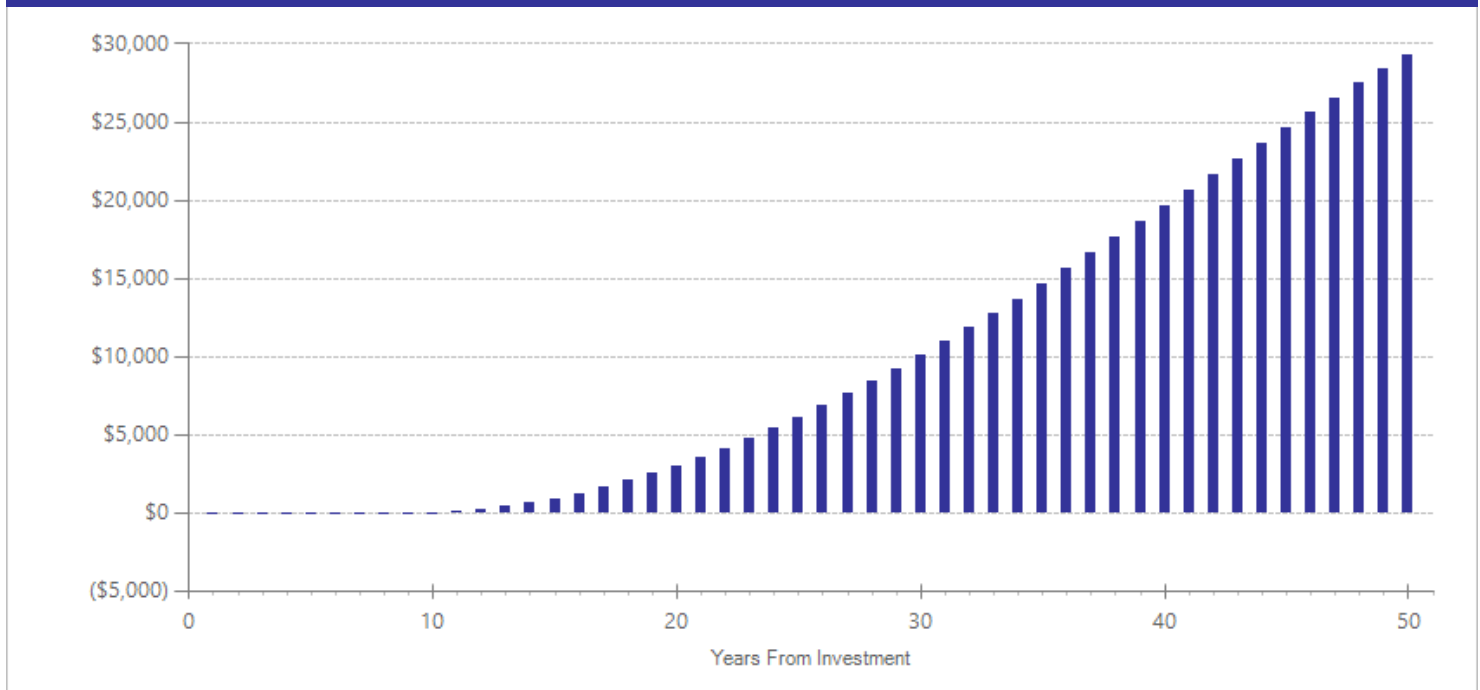
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|--------|
| Program costs | \$299 | 2013 | Present value of net program costs (in 2017 dollars) | (\$60) |
| Comparison costs | \$242 | 2013 | Cost range (+ or -) | 10 % |

Content-Focused Coaching provides additional training time for principals, coaches, and teachers beyond the usual amount of time in other coaching programs. We calculated the cost of Content-Focused Coaching by adding this additional time to the WSIPP estimate for coaching-as-usual based on the framework described in Knight, D.S. (2012). Assessing the cost of instructional coaching. *Journal of Education Finance*, 38(1), 52-80. The estimate is based on one-full time coach per school at the average compensation cost (including benefits) for K-8 teachers as reported by the Office of the Superintendent of Public Instruction. In addition, the estimate includes costs related to administrator time, materials, professional development, and classroom teacher time to work with coaches. To calculate a per-student annual cost, we used the average number of students per school in Washington's prototypical schools formula.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|-------------------|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| Test scores | 9 | 1 | 1543 | 0.107 | 0.037 | 9 | 0.064 | 0.041 | 17 | 0.250 | 0.001 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

Citations Used in the Meta-Analysis

Matsumura, L.C., Garnier, H.E., & Spybrook, J. (2013). Literacy coaching to improve student reading achievement: A multi-level mediation model. *Learning and Instruction, 25*(1), 35-48.

Head Start Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated December 2013.

Program Description: Head Start is a federal program that funds early childhood education, social services and health services for children ages 0-5. Studies in this analysis focus on center-based Head Start programs for 3- and 4- year olds.

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|----------------------------|------------------|---------------------------------|----------|
| Taxpayers | \$7,254 | Benefit to cost ratio | \$2.18 |
| Participants | \$9,775 | Benefits minus costs | \$10,688 |
| Others | \$6,215 | Chance the program will produce | |
| Indirect | (\$3,468) | benefits greater than the costs | 70 % |
| Total benefits | \$19,776 | | |
| Net program cost | (\$9,088) | | |
| Benefits minus cost | \$10,688 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|--|----------------|----------------|---------------------|-----------------------|-----------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Crime | \$0 | \$1,440 | \$3,195 | \$728 | \$5,362 |
| Labor market earnings associated with high school graduation | \$11,192 | \$5,082 | \$5,132 | \$0 | \$21,406 |
| K-12 grade repetition | \$0 | \$99 | \$0 | \$50 | \$150 |
| Public assistance | (\$3) | \$7 | \$0 | \$3 | \$7 |
| Health care associated with educational attainment | (\$464) | \$1,701 | (\$1,847) | \$859 | \$249 |
| Costs of higher education | (\$899) | (\$1,059) | (\$295) | (\$533) | (\$2,786) |
| Subtotals | \$9,826 | \$7,270 | \$6,185 | \$1,107 | \$24,388 |
| From secondary participant | | | | | |
| Labor market earnings associated with high school graduation | \$53 | \$24 | \$24 | \$0 | \$102 |
| K-12 grade repetition | \$0 | \$1 | \$0 | \$1 | \$2 |
| Health care associated with educational attainment | (\$2) | \$8 | \$7 | \$4 | \$17 |
| Costs of higher education | (\$4) | (\$5) | (\$1) | (\$3) | (\$13) |
| Mortality associated with smoking | (\$98) | (\$44) | \$0 | \$0 | (\$142) |
| Subtotals | (\$51) | (\$16) | \$30 | \$2 | (\$34) |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$4,578) | (\$4,578) |
| Totals | \$9,775 | \$7,254 | \$6,215 | (\$3,468) | \$19,776 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

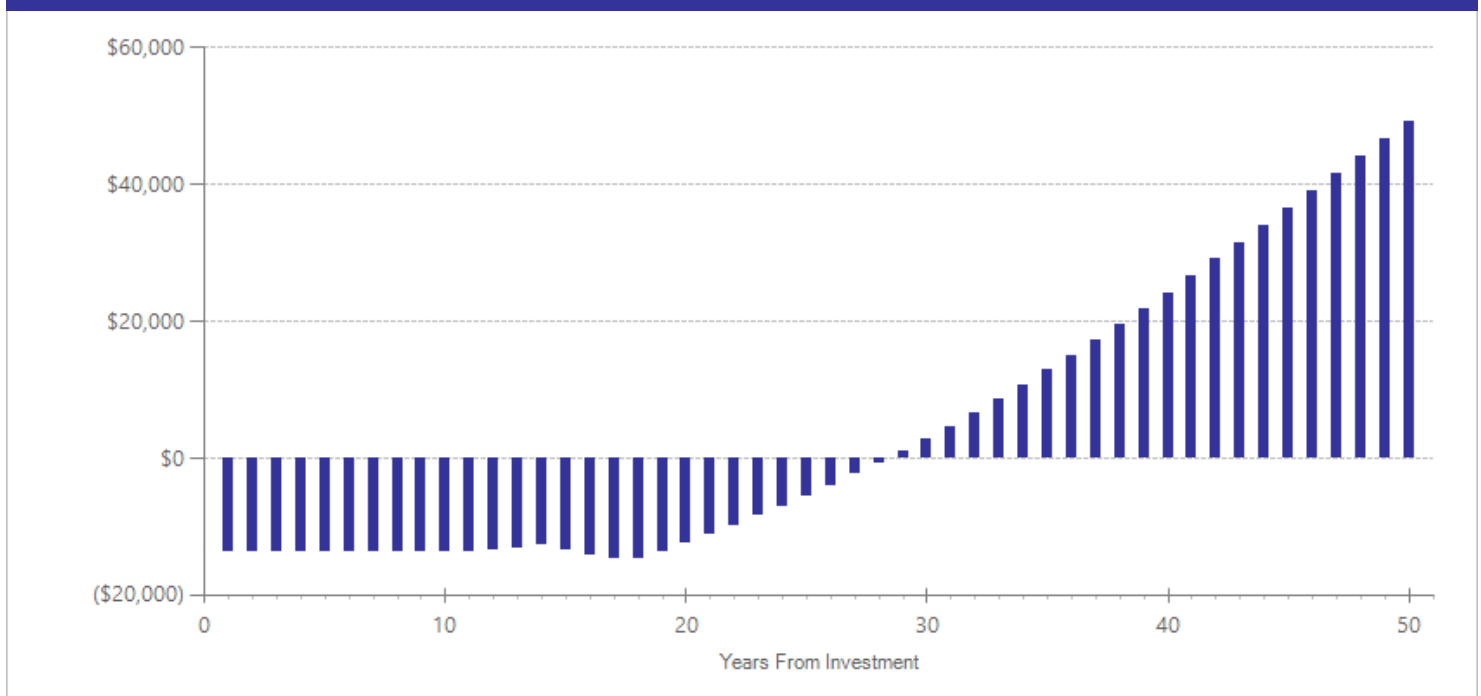
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|-----------|
| Program costs | \$9,469 | 2012 | Present value of net program costs (in 2017 dollars) | (\$9,088) |
| Comparison costs | \$903 | 2012 | Cost range (+ or -) | 10 % |

Per-child costs calculated using a weighted average of Head Start, American Indian Alaska Native Head Start and Migrant and Seasonal Head Start costs, including administrative costs per slot (http://www.del.wa.gov/publications/partnerships/docs/ECEAP_HS_Profile_2012.pdf). Comparison group costs reflect the range of other options that low-income children in Washington might receive, including state-subsidized child care and Washington's Early Childhood Education and Assistance Program (ECEAP). Comparison group costs were calculated by dividing the cost of ECEAP (\$55,867,278) by the number of children who are eligible but not served by HS (32,291). The number of eligible students includes all ECEAP students; http://www.del.wa.gov/publications/partnerships/docs/ECEAP_HS_Profile_2012.pdf.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the "break-even" point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | Primary or secondary participant | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|---------------------------------|---------------|----------------------------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | | ES | SE | Age | ES | SE | Age | | |
| Crime | 4 | Primary | 2 | 517 | -0.183 | 0.270 | 21 | -0.183 | 0.270 | 31 | -0.183 | 0.497 |
| High school graduation | 4 | Primary | 2 | 517 | 0.181 | 0.077 | 18 | 0.181 | 0.077 | 18 | 0.181 | 0.018 |
| K-12 grade repetition | 4 | Primary | 5 | 1738 | -0.075 | 0.133 | 12 | -0.075 | 0.133 | 12 | -0.075 | 0.572 |
| Teen births under age 18 | 4 | Primary | 1 | 327 | -0.466 | 0.292 | 19 | -0.466 | 0.292 | 19 | -0.466 | 0.111 |
| Test scores | 4 | Primary | 7 | 4750 | 0.172 | 0.027 | 4 | 0.036 | 0.006 | 17 | 0.172 | 0.001 |
| Teen births (second generation) | 1 | Secondary | 1 | 327 | -0.466 | 0.292 | 19 | -0.466 | 0.292 | 19 | -0.466 | 0.111 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

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Tutoring: By non-certificated adults, small-group, structured Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated June 2014.

Program Description: The programs included in this analysis are structured, systematic approaches to tutoring small-groups of struggling students in grades K–4 in specific English language arts and/or mathematics skills. The evaluated programs include a variety of specific programs and curricula such as (in no particular order) Quick Reads, Gottshall Early Reading Intervention, and Hot Math. The evaluated tutoring programs provide, on average, 22 hours of tutoring time to groups of two to six (usually three) early elementary students. Tutors are typically instructional aides or college student volunteers who receive 20 hours of training each year. Certificated teachers provide oversight and planning support.

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|-------------------------|----------------|---------------------------------|---------|
| Taxpayers | \$2,439 | Benefit to cost ratio | \$16.70 |
| Participants | \$5,035 | Benefits minus costs | \$8,804 |
| Others | \$2,102 | Chance the program will produce | |
| Indirect | (\$211) | benefits greater than the costs | 78 % |
| <u>Total benefits</u> | <u>\$9,365</u> | | |
| <u>Net program cost</u> | <u>(\$561)</u> | | |
| Benefits minus cost | \$8,804 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|--|----------------|----------------|---------------------|-----------------------|----------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Labor market earnings associated with test scores | \$5,072 | \$2,303 | \$2,250 | \$0 | \$9,625 |
| Health care associated with educational attainment | (\$37) | \$136 | (\$148) | \$68 | \$19 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$280) | (\$280) |
| Totals | \$5,035 | \$2,439 | \$2,102 | (\$211) | \$9,365 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

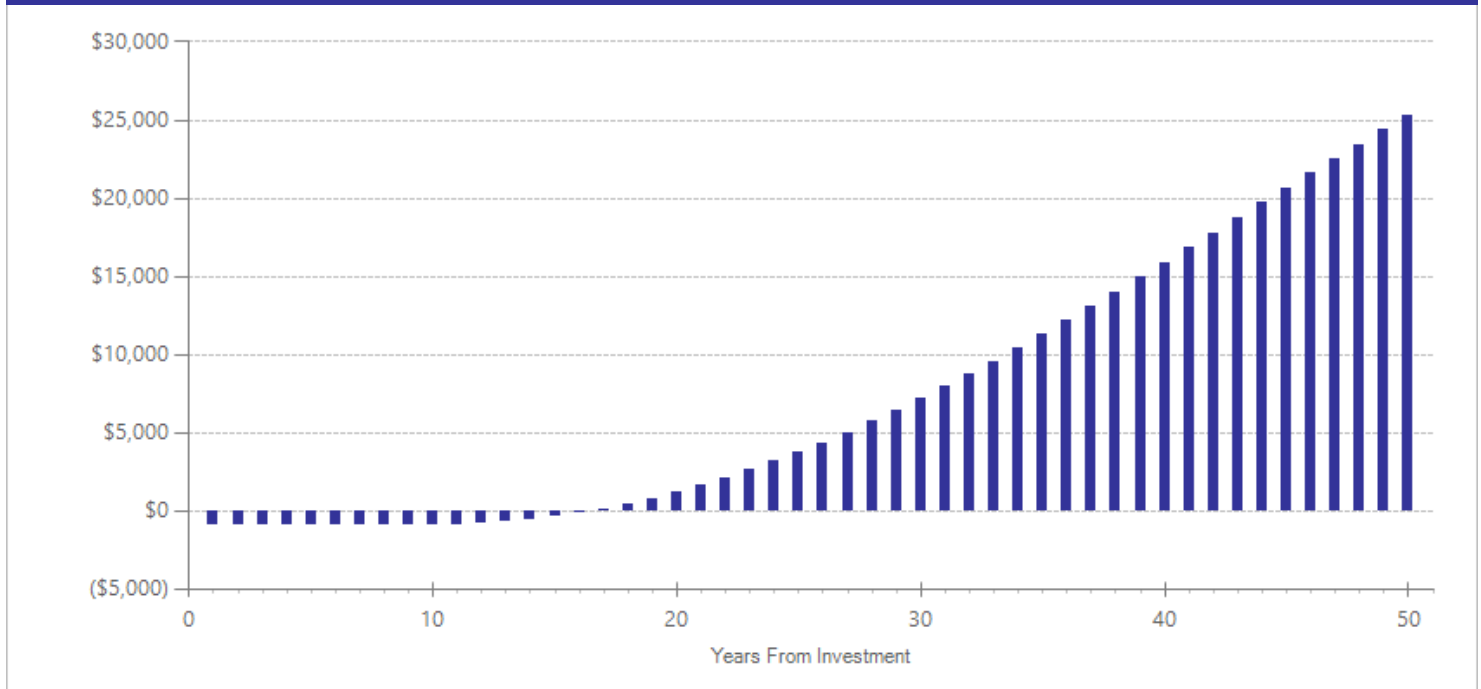
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|---------|
| Program costs | \$536 | 2013 | Present value of net program costs (in 2017 dollars) | (\$561) |
| Comparison costs | \$0 | 2013 | Cost range (+ or -) | 10 % |

In the evaluations included in this meta-analysis, a non-certificated adult (such as an instructional aide or college student) provides, on average, 22 hours of tutoring to six students per year in groups of three and receives 20 hours of training. A certificated teacher provides six hours of planning support and oversight per group. To calculate a per-student annual cost, we used average Washington State compensation costs (including benefits) for K-8 teachers and instructional aides as reported by the Office of the Superintendent of Public Instruction, divided by the total number of students served.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|-------------------|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| Test scores | 7 | 9 | 611 | 0.126 | 0.063 | 7 | 0.059 | 0.069 | 17 | 0.318 | 0.001 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

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Teacher professional development: Targeted Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated June 2014.

Program Description: Generally, professional development (PD) for K–12 teachers includes activities such as workshops, conferences, summer institutes, and time set aside during the school year for staff development. Targeted PD focuses on improving teaching in a particular content area (such as reading, math, and science) and/or a particular grade level. The specific types of PD evaluated and included in this meta-analysis are (in no particular order) Language Essentials for Teachers of Reading and Spelling (LETRS), Pacific Communities with High Performance in Literacy Development (Pacific CHILD), Cognitively Guided Instruction, Math & Science Partnerships (MSP), Teaching Science, Mathematics and Relevant Technologies (Teaching SMART), Discovery Model Schools Initiative, the Integrated Mathematics Assessment, Teaching Cases, and Metacognitive Analysis. Most forms of targeted PD include a summer institute in addition to training provided during the regular school year.

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|----------------------------|----------------|---------------------------------|---------|
| Taxpayers | \$2,238 | Benefit to cost ratio | \$32.05 |
| Participants | \$4,622 | Benefits minus costs | \$8,454 |
| Others | \$1,940 | Chance the program will produce | |
| Indirect | (\$74) | benefits greater than the costs | 79 % |
| Total benefits | \$8,726 | | |
| Net program cost | (\$272) | | |
| Benefits minus cost | \$8,454 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|--|----------------|----------------|---------------------|-----------------------|----------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Labor market earnings associated with test scores | \$4,656 | \$2,114 | \$2,075 | \$0 | \$8,845 |
| Health care associated with educational attainment | (\$34) | \$124 | (\$135) | \$62 | \$17 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$136) | (\$136) |
| Totals | \$4,622 | \$2,238 | \$1,940 | (\$74) | \$8,726 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²“Others” includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³“Indirect benefits” includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

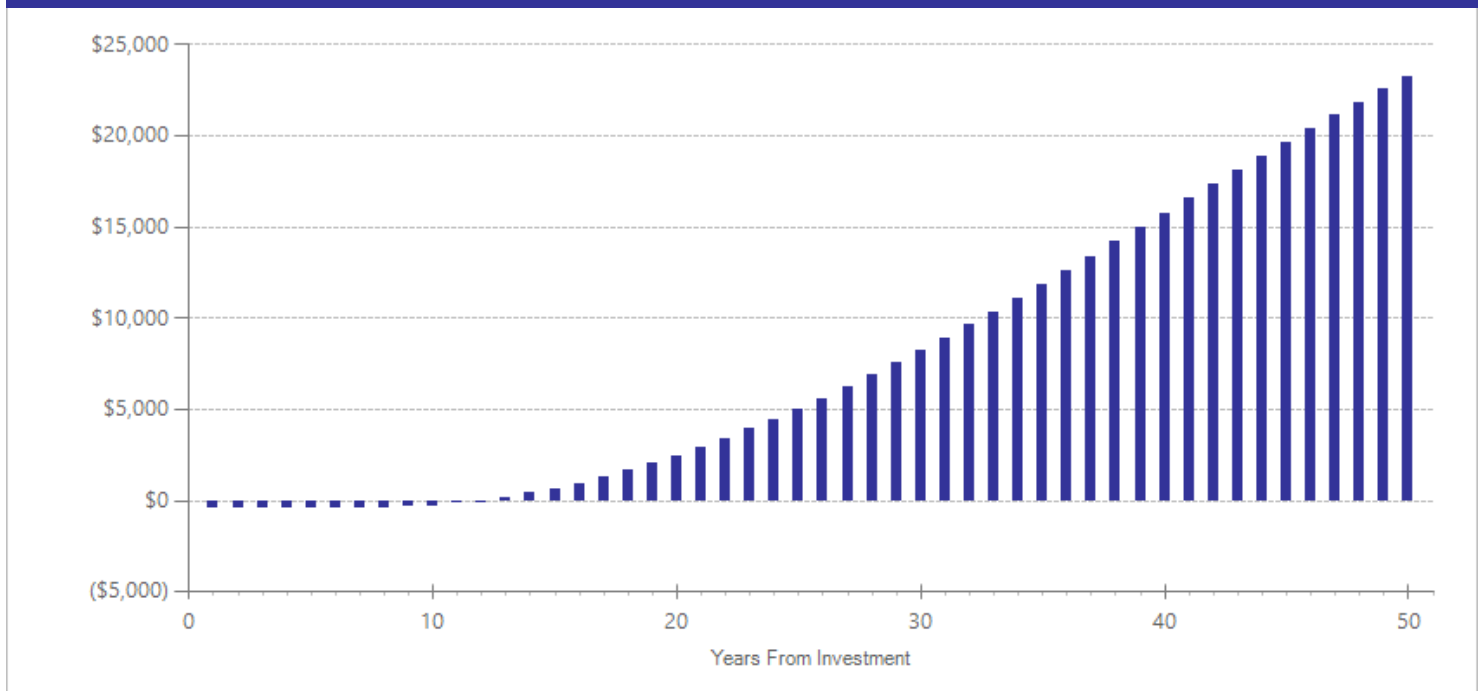
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|---------|
| Program costs | \$260 | 2013 | Present value of net program costs (in 2017 dollars) | (\$272) |
| Comparison costs | \$0 | 2013 | Cost range (+ or -) | 10 % |

In the evaluations included in the meta-analysis, teachers received an average of 63 additional hours of targeted professional development (PD) in comparison with the usual amount of PD time. We calculated the value of PD time using average teacher salaries (including benefits) in Washington State as reported by the Office of Superintendent of Public Instruction. To calculate a per-student annual cost, we divided compensation costs by the number of students per classroom in Washington's prototypical schools formula and add per-student materials, supplies, and operating costs to account for the overhead (i.e. facility and administrative costs) associated with providing PD.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|-------------------|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| Test scores | 10 | 14 | 11652 | 0.071 | 0.055 | 11 | 0.051 | 0.060 | 17 | 0.198 | 0.008 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

Citations Used in the Meta-Analysis

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Consultant teachers: Coaching Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated June 2014.

Program Description: Coaching is a form of job-embedded professional development for teachers. Coaching programs (sometimes called literacy coaching, mathematics coaching, or instructional coaching) typically assign a full-time, trained teacher to an individual school to serve as a coach. Generally, coaches work directly with classroom teachers (usually one-on-one or in small groups) to help them improve their instructional strategies. Coaches observe teaching, provide individual feedback, engage in co-teaching sessions, model effective instructional practices, and provide professional development workshops. The studies in this analysis focused on providing coaching to teachers in 2nd-7th grades.

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|-------------------------|----------------|---------------------------------|---------|
| Taxpayers | \$1,729 | Benefit to cost ratio | \$25.44 |
| Participants | \$3,573 | Benefits minus costs | \$6,445 |
| Others | \$1,493 | Chance the program will produce | |
| Indirect | (\$85) | benefits greater than the costs | 81 % |
| <u>Total benefits</u> | <u>\$6,709</u> | | |
| <u>Net program cost</u> | <u>(\$264)</u> | | |
| Benefits minus cost | \$6,445 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|--|----------------|----------------|---------------------|-----------------------|----------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Labor market earnings associated with test scores | \$3,599 | \$1,634 | \$1,596 | \$0 | \$6,828 |
| Health care associated with educational attainment | (\$26) | \$94 | (\$103) | \$47 | \$13 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$132) | (\$132) |
| Totals | \$3,573 | \$1,729 | \$1,493 | (\$85) | \$6,709 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

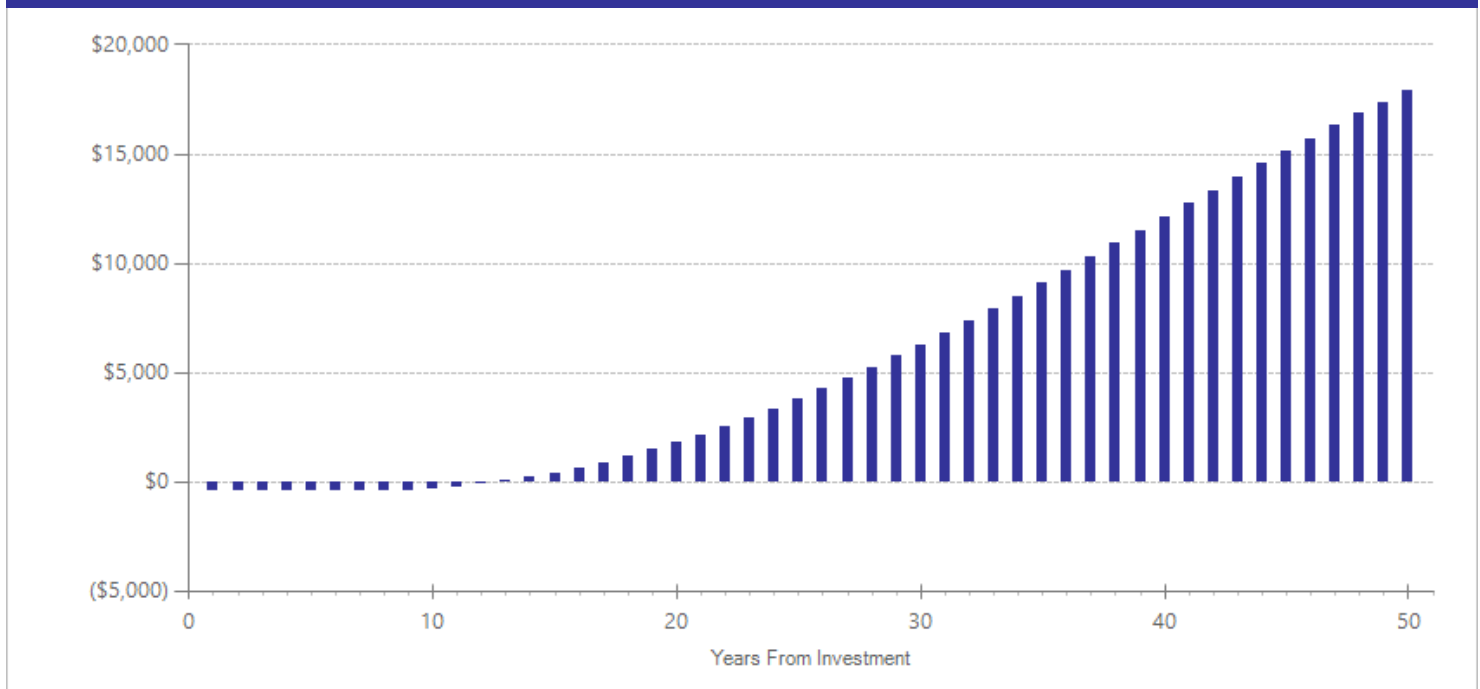
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|---------|
| Program costs | \$252 | 2013 | Present value of net program costs (in 2017 dollars) | (\$264) |
| Comparison costs | \$0 | 2013 | Cost range (+ or -) | 10 % |

The cost is a WSIPP estimate based on the framework described in Knight, D.S. (2012). Assessing the cost of instructional coaching. *Journal of Education Finance*, 38(1), 52-80. The estimate is based on one-full time coach per school at the average compensation cost (including benefits) for K-8 teachers as reported by the Office of the Superintendent of Public Instruction. In addition, the estimate includes costs related to administrator time, materials, professional development, and classroom teacher time to work with coaches. To calculate a per-student annual cost, we use the average number of students per school in Washington's prototypical schools formula.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|-------------------|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| Test scores | 10 | 11 | 12805 | 0.060 | 0.037 | 10 | 0.040 | 0.041 | 17 | 0.060 | 0.105 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

Citations Used in the Meta-Analysis

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Teacher professional development: Induction/mentoring

Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated June 2014.

Program Description: Teacher induction programs typically assign an experienced teacher-mentor to new teachers in the first and second year of their careers. In more intensive programs, additional support includes professional development opportunities and structured collaboration time with other teachers at the school. The evaluations included in the meta-analysis examine more-intensive programs compared to less-intensive programs.

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|----------------------------|----------------|---------------------------------|---------|
| Taxpayers | \$1,478 | Benefit to cost ratio | \$74.67 |
| Participants | \$3,056 | Benefits minus costs | \$5,726 |
| Others | \$1,267 | Chance the program will produce | |
| Indirect | \$2 | benefits greater than the costs | 64 % |
| Total benefits | \$5,803 | | |
| Net program cost | (\$78) | | |
| Benefits minus cost | \$5,726 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|--|----------------|----------------|---------------------|-----------------------|----------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Labor market earnings associated with test scores | \$3,078 | \$1,398 | \$1,354 | \$0 | \$5,830 |
| Health care associated with educational attainment | (\$22) | \$81 | (\$88) | \$41 | \$12 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$39) | (\$39) |
| Totals | \$3,056 | \$1,478 | \$1,267 | \$2 | \$5,803 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

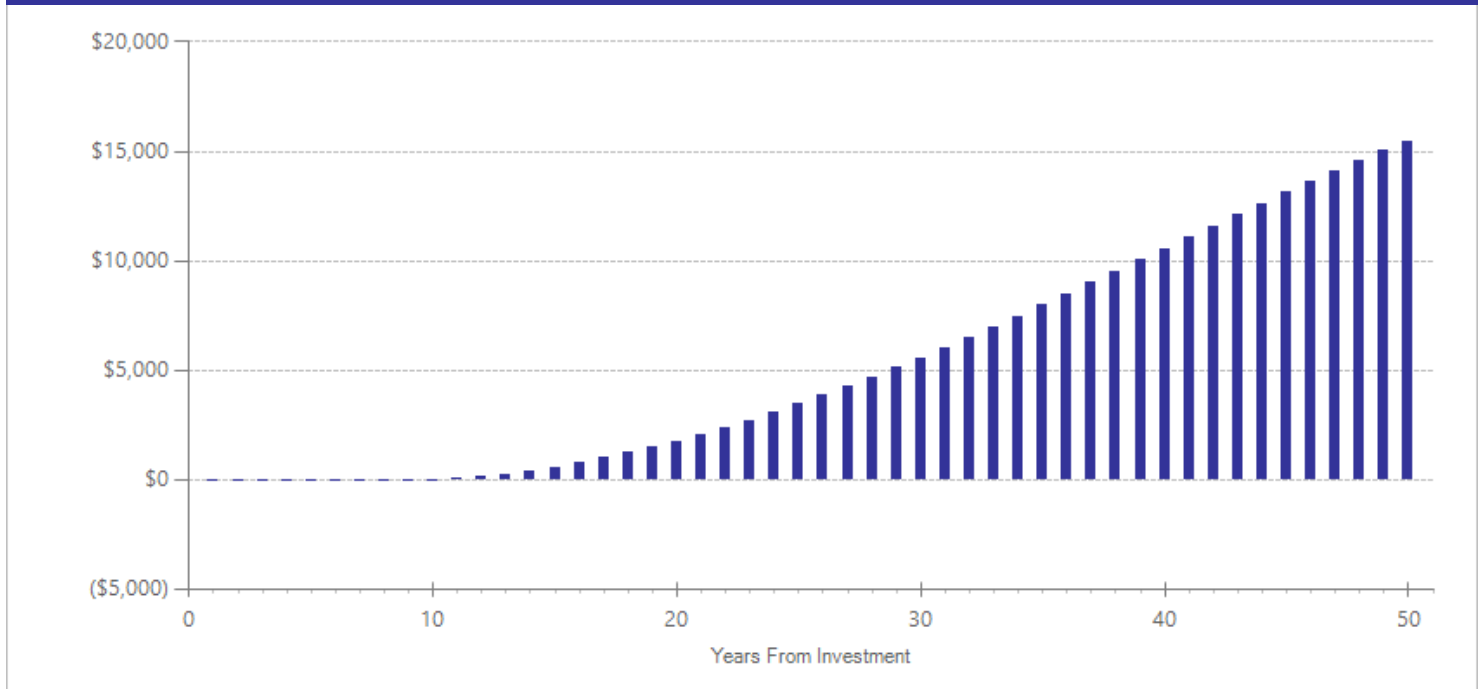
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|--------|
| Program costs | \$106 | 2013 | Present value of net program costs (in 2017 dollars) | (\$78) |
| Comparison costs | \$29 | 2009 | Cost range (+ or -) | 20 % |

The cost estimate for the treatment group—receiving more intensive mentoring—is based on Washington State's per-first-year teacher allocation for the Beginning Educator Support Team (BEST) program in FY 2013. The cost estimate for the comparison group is the FY 2009 per-teacher allocation for the Teacher Assistance Program (TAP) in Washington State. Each of these estimates is divided by the number of students per classroom in Washington's prototypical schools formula.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|-------------------|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| Test scores | 10 | 4 | 1623 | 0.046 | 0.082 | 11 | 0.033 | 0.090 | 17 | 0.046 | 0.572 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

Citations Used in the Meta-Analysis

- Glazerman, S., Isenberg, E., Dolfin, S., Bleeker, M., Johnson, A., Grider, M., . . . Ali, M. (2010). *Impacts of comprehensive teacher induction: Final results from a randomized controlled study*. Washington, DC: National Center for Education Evaluation and Regional Assistance.
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Out-of-school-time tutoring by adults

Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated June 2014.

Program Description: The out-of-school time tutoring programs included in this analysis provide one-on-one or small-group tutoring support to struggling students in English language arts and/or mathematics outside of the regular school day (usually after school). The evaluated tutoring programs provide, on average, about 40 hours of tutoring time to students each year. Tutors are typically specially trained adults (e.g. instructional aides and community volunteers) and receive approximately 10 hours of training.

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|----------------------------|----------------|---------------------------------|---------|
| Taxpayers | \$1,752 | Benefit to cost ratio | \$6.71 |
| Participants | \$3,619 | Benefits minus costs | \$5,484 |
| Others | \$1,507 | Chance the program will produce | |
| Indirect | (\$433) | benefits greater than the costs | 93 % |
| Total benefits | \$6,444 | | |
| Net program cost | (\$960) | | |
| Benefits minus cost | \$5,484 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|--|----------------|----------------|---------------------|-----------------------|----------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Labor market earnings associated with test scores | \$3,645 | \$1,655 | \$1,612 | \$0 | \$6,912 |
| Health care associated with educational attainment | (\$26) | \$96 | (\$105) | \$48 | \$13 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$481) | (\$481) |
| Totals | \$3,619 | \$1,752 | \$1,507 | (\$433) | \$6,444 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

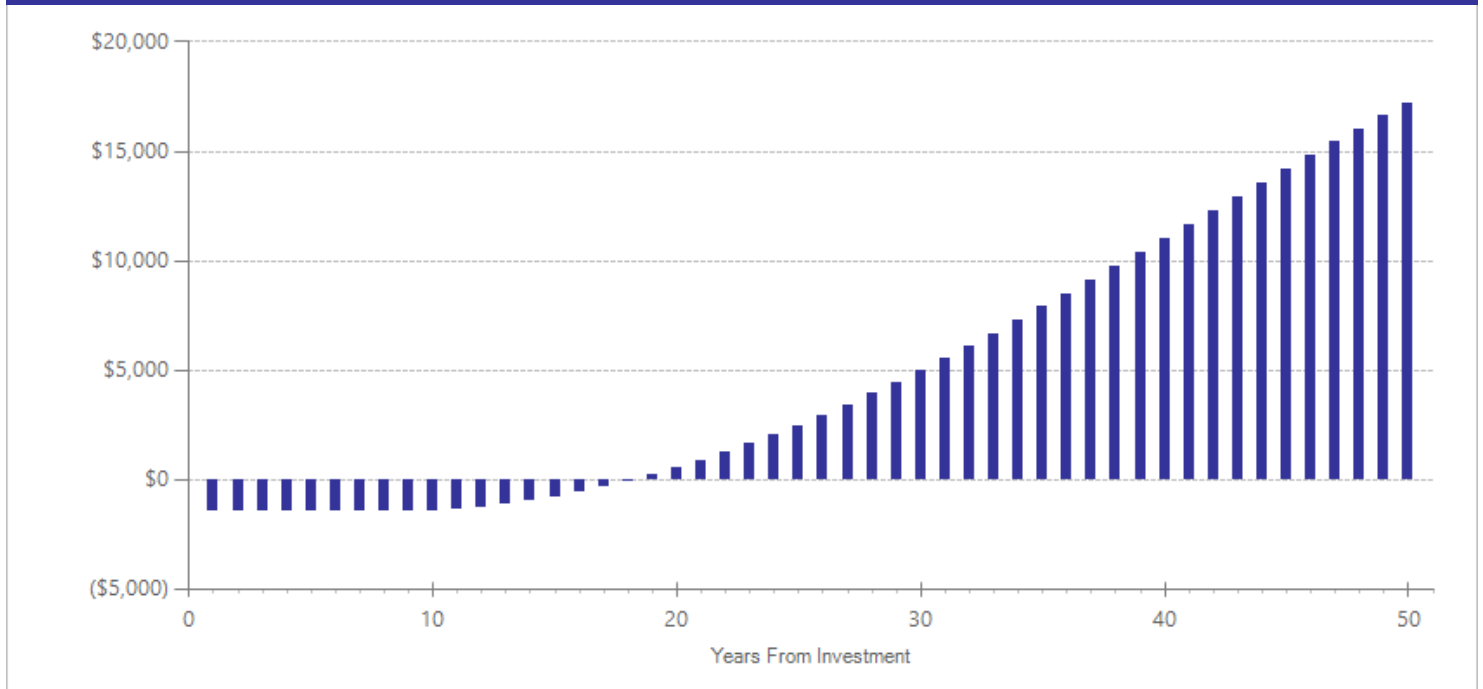
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|---------|
| Program costs | \$917 | 2013 | Present value of net program costs (in 2017 dollars) | (\$960) |
| Comparison costs | \$0 | 2013 | Cost range (+ or -) | 10 % |

In the evaluations included in the meta-analysis, the average after-school tutoring program provides 40 hours of intervention and ten hours of training. The cost estimate assumes that adult instructional aides or community volunteers provide tutoring to groups of two students. To calculate a per-student annual cost, we use average Washington State compensation costs (including benefits) for instructional aides as reported by the Office of the Superintendent of Public Instruction and add per-student materials, supplies, and operating costs to account for overhead (i.e. facility and administrative costs).

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|-------------------|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| Test scores | 9 | 6 | 6082 | 0.068 | 0.018 | 9 | 0.041 | 0.020 | 17 | 0.259 | 0.033 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

Citations Used in the Meta-Analysis

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Summer learning programs: Academically focused Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated June 2014.

Program Description: This analysis includes a variety of summer learning programs for students in grades K–8 in which academic improvement is the main goal, often with a focus on remediation and/or prevention of summer learning loss. The programs encompass a range of models and include both community- and school-provided programs. Some programs offer services beyond academic support, such as enrichment and recreation. Based on the studies in this analysis, a typical program lasts about six weeks. This analysis excludes programs that focus on other goals such as general youth development or job training and programs that combine summer learning programs with additional support during the school year.

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|-------------------------|------------------|---------------------------------|---------|
| Taxpayers | \$1,650 | Benefit to cost ratio | \$5.02 |
| Participants | \$3,410 | Benefits minus costs | \$4,760 |
| Others | \$1,429 | Chance the program will produce | |
| Indirect | (\$545) | benefits greater than the costs | 87 % |
| <u>Total benefits</u> | <u>\$5,944</u> | | |
| <u>Net program cost</u> | <u>(\$1,184)</u> | | |
| Benefits minus cost | \$4,760 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|--|----------------|----------------|---------------------|-----------------------|----------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Labor market earnings associated with test scores | \$3,435 | \$1,560 | \$1,527 | \$0 | \$6,522 |
| Health care associated with educational attainment | (\$25) | \$90 | (\$98) | \$45 | \$12 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$590) | (\$590) |
| Totals | \$3,410 | \$1,650 | \$1,429 | (\$545) | \$5,944 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

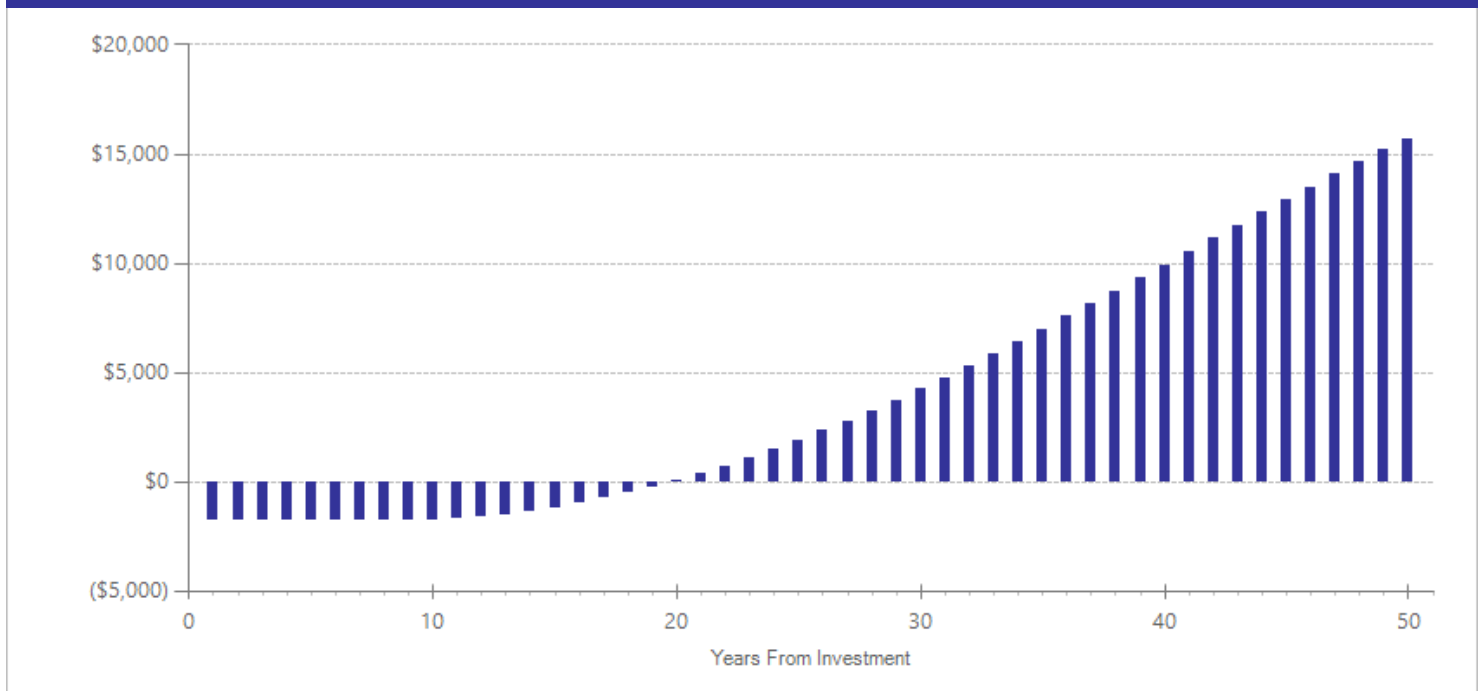
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|-----------|
| Program costs | \$1,132 | 2013 | Present value of net program costs (in 2017 dollars) | (\$1,184) |
| Comparison costs | \$0 | 2013 | Cost range (+ or -) | 10 % |

In the evaluations included in this meta-analysis, the average summer program included 140 service hours and 40 hours of staff training/planning time. Teachers had, on average, 15 students in each class. To calculate a per-student annual cost, we used average Washington State compensation costs (including benefits) for K-8 teachers as reported by the Office of the Superintendent of Public Instruction, divided by the average number of students per class in the evaluated programs. We include per-student annual materials, supplies, and operating costs. The cost estimate provided here does not account for meals or transportation.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|-------------------|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| Test scores | 9 | 13 | 46259 | 0.064 | 0.020 | 9 | 0.038 | 0.022 | 17 | 0.064 | 0.002 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

Citations Used in the Meta-Analysis

- Borman, G.D., & Dowling, N. (2006). Longitudinal achievement effects of multiyear summer school: Evidence from the Teach Baltimore randomized field trial. *Educational Evaluation & Policy Analysis, 28*(1), 25-48.
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Tutoring: Supplemental computer-assisted instruction for struggling readers

Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated June 2016.

Program Description: We included computer assisted instruction that was a supplement rather than a replacement for regular instruction. Studies that were focused exclusively on special education populations were excluded. Of the four studies that we included, three were evaluations of Fast ForWord and one was an evaluation of FLASH. On average, the reviewed programs required 4.03 hours of teacher time per student, and effects were reported after one school year.

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|----------------------------|----------------|---------------------------------|---------|
| Taxpayers | \$1,229 | Benefit to cost ratio | \$8.23 |
| Participants | \$2,541 | Benefits minus costs | \$4,039 |
| Others | \$1,074 | Chance the program will produce | |
| Indirect | (\$246) | benefits greater than the costs | 59 % |
| Total benefits | \$4,597 | | |
| Net program cost | (\$559) | | |
| Benefits minus cost | \$4,039 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|--|----------------|----------------|---------------------|-----------------------|----------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Labor market earnings associated with test scores | \$2,559 | \$1,162 | \$1,146 | \$0 | \$4,868 |
| Health care associated with educational attainment | (\$18) | \$67 | (\$73) | \$33 | \$9 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$280) | (\$280) |
| Totals | \$2,541 | \$1,229 | \$1,074 | (\$246) | \$4,597 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

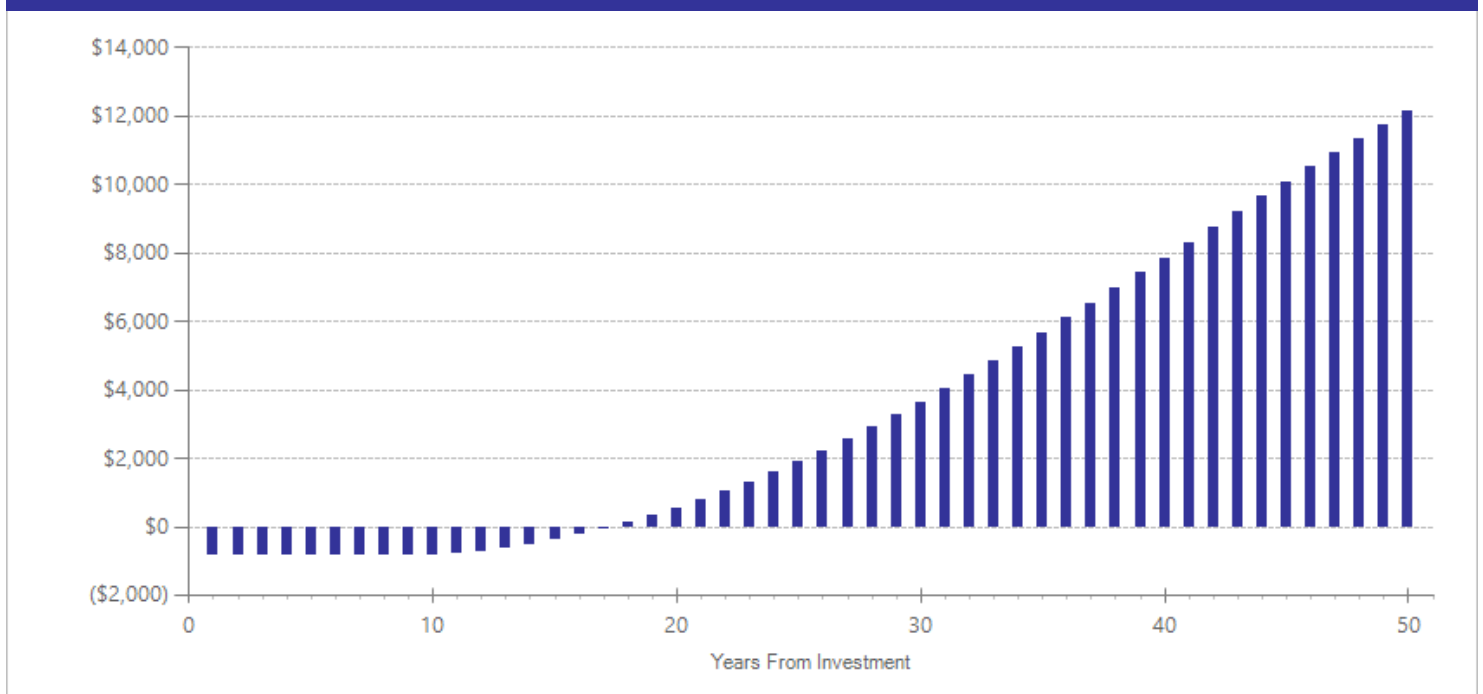
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|---------|
| Program costs | \$535 | 2013 | Present value of net program costs (in 2017 dollars) | (\$559) |
| Comparison costs | \$0 | 2013 | Cost range (+ or -) | 50 % |

In this review, studies reported the effect of one year of the program. The cost of the supplemental computer assisted instruction can vary widely based on the number of students in each school using the program and the number of students using the program at one time. The interventions included in this review required an average of 4.03 hours of teacher time per student. The per student staff costs were calculated by multiplying the staff hours/student by the hour rate of a K-8 teacher in 2013 (<https://www.k12.wa.us/safs/PUB/PER/1314/tbl34.pdf>). We estimated that the per student licensing cost was \$210 per student for a program like Fast ForWord in 2016 based on a school license of \$21,000 assuming that 100 students in each school use the program (personal communication with Gayle Davies, Scientific Learning, March 30, 2016).

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|-------------------|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| Test scores | 9 | 4 | 326 | 0.047 | 0.089 | 9 | 0.028 | 0.098 | 17 | 0.136 | 0.317 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

Citations Used in the Meta-Analysis

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Growth mindset interventions

Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated February 2018.

Program Description: This analysis evaluates psychological interventions that encourage students to believe that intelligence is malleable and can be changed with experience and learning. Growth mindset interventions teach students scientific facts about the brain's plasticity and the physiological nature of learning. The interventions aim to enhance students' persistence and prevent students from attributing setbacks to innate ability. Most students in this analysis were in grades four through nine. Students receive between two to eight lessons, each lasting about one hour. Lessons can be delivered by teachers, mentors, or through the use of internet software. Lessons occur during regular class periods.

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|----------------------------|----------------|---------------------------------|---------|
| Taxpayers | \$954 | Benefit to cost ratio | \$94.89 |
| Participants | \$1,975 | Benefits minus costs | \$3,725 |
| Others | \$831 | Chance the program will produce | |
| Indirect | \$5 | benefits greater than the costs | 57 % |
| Total benefits | \$3,765 | | |
| Net program cost | (\$40) | | |
| Benefits minus cost | \$3,725 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|--|----------------|--------------|---------------------|-----------------------|----------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Labor market earnings associated with test scores | \$1,989 | \$903 | \$886 | \$0 | \$3,779 |
| Health care associated with educational attainment | (\$14) | \$50 | (\$55) | \$25 | \$6 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$20) | (\$20) |
| Totals | \$1,975 | \$954 | \$831 | \$5 | \$3,765 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

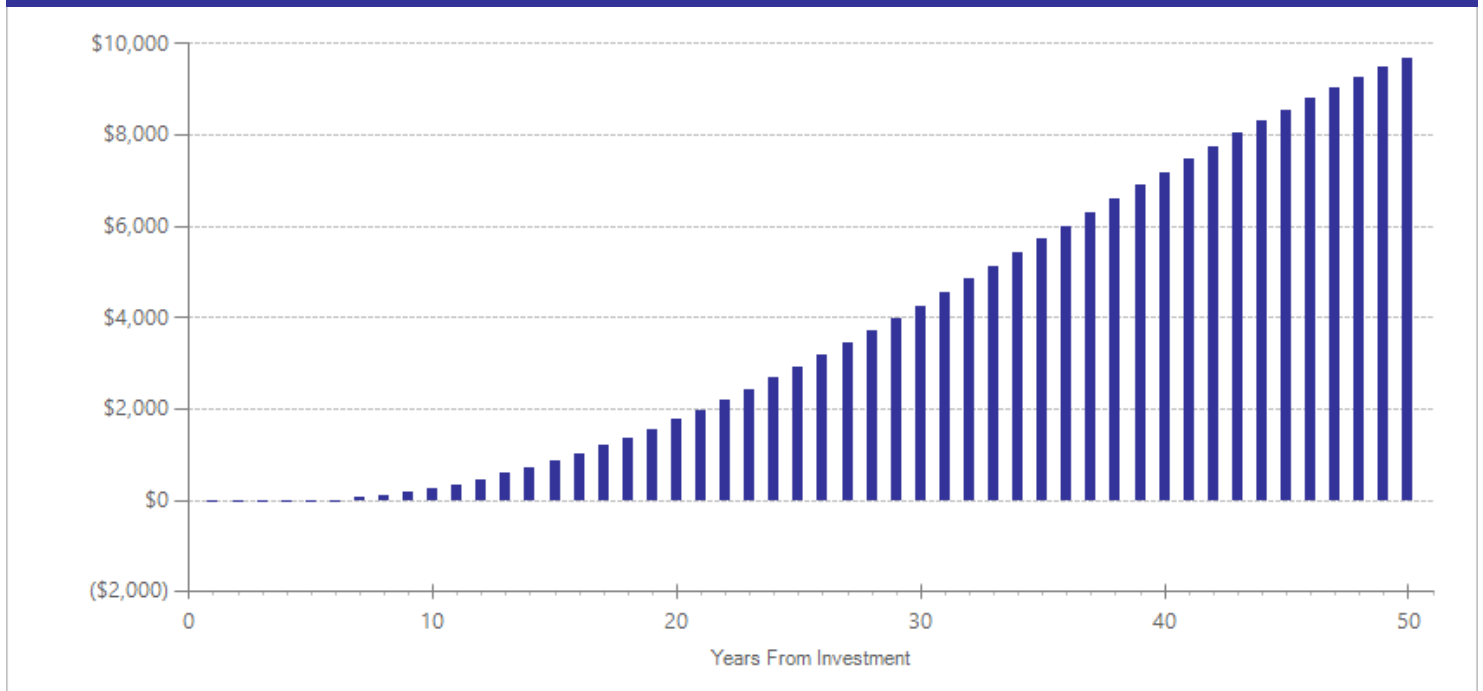
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|--------|
| Program costs | \$39 | 2016 | Present value of net program costs (in 2017 dollars) | (\$40) |
| Comparison costs | \$0 | 2016 | Cost range (+ or -) | 60 % |

To estimate the annual per-participant program cost, we used the average Washington State compensation costs (including benefits) for certificated teachers. We retrieved teacher salary and benefits figures from the Office of Superintendent of Public Instruction (OSPI). We assume students receive five hourly lessons.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|----------------------------------|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| Grade point average [^] | 14 | 4 | 2165 | 0.062 | 0.085 | 14 | n/a | n/a | n/a | 0.145 | 0.096 |
| Test scores | 14 | 3 | 266 | 0.032 | 0.098 | 14 | 0.019 | 0.108 | 17 | 0.057 | 0.679 |

[^]WSIPP’s benefit-cost model does not monetize this outcome.

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

Citations Used in the Meta-Analysis

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Parents as tutors with teacher oversight

Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated June 2014.

Program Description: In "parents as tutors" programs, teachers meet with parents in person and maintain contact over the phone to train and encourage parents to engage in planned, structured academic activities with their children at home, usually in the form of one-on-one reading tutoring. This review does not include the impact on children's academic achievement from parent involvement in general; only school-based programs are included.

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|----------------------------|----------------|---------------------------------|---------|
| Taxpayers | \$1,180 | Benefit to cost ratio | \$5.10 |
| Participants | \$2,432 | Benefits minus costs | \$3,407 |
| Others | \$1,008 | Chance the program will produce | |
| Indirect | (\$383) | benefits greater than the costs | 57 % |
| Total benefits | \$4,238 | | |
| Net program cost | (\$831) | | |
| Benefits minus cost | \$3,407 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|--|----------------|----------------|---------------------|-----------------------|----------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Labor market earnings associated with test scores | \$2,451 | \$1,113 | \$1,081 | \$0 | \$4,645 |
| Health care associated with educational attainment | (\$18) | \$67 | (\$73) | \$33 | \$9 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$416) | (\$416) |
| Totals | \$2,432 | \$1,180 | \$1,008 | (\$383) | \$4,238 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

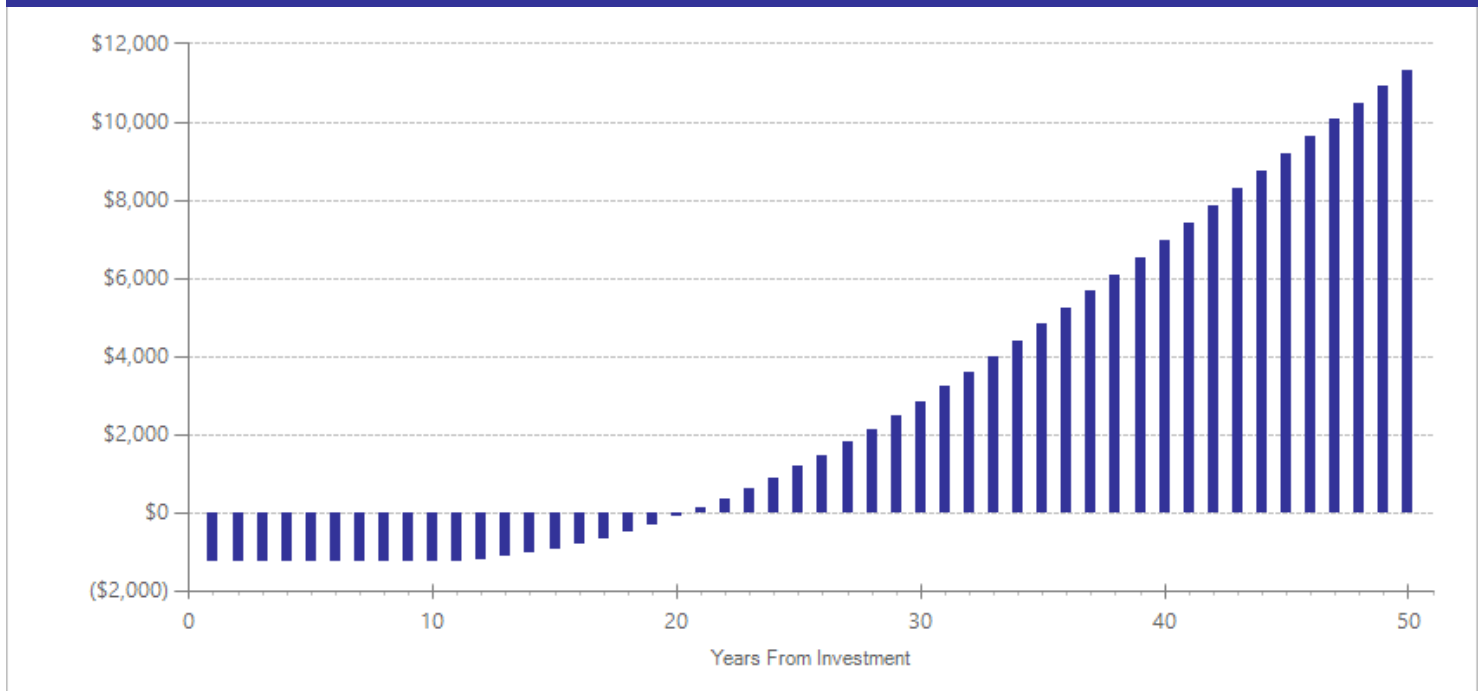
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|---------|
| Program costs | \$794 | 2013 | Present value of net program costs (in 2017 dollars) | (\$831) |
| Comparison costs | \$0 | 2013 | Cost range (+ or -) | 10 % |

To estimate costs, we assume that teachers spend an average of one-quarter hour per week to maintain contact with parents during the school year, based on the evaluations included in our analysis. We calculated the value of teacher time using average Washington State compensation costs (including benefits) for a K-8 teacher as reported by the Office of the Superintendent of Public Instruction.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|-------------------|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| Test scores | 8 | 9 | 149 | 0.050 | 0.115 | 9 | 0.030 | 0.127 | 17 | 0.167 | 0.149 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

Citations Used in the Meta-Analysis

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Tutoring: By adults, one-on-one, non-structured Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated June 2014.

Program Description: The tutoring programs included in this analysis provide one-on-one assistance to struggling students in English language arts and/or mathematics. The evaluated programs typically allow tutors to exercise their own discretion when selecting and implementing tutoring strategies. The programs typically serve early elementary school students and provide, on average, about 30 hours of tutoring time to an individual student each year. The tutors are non-certificated adults (e.g. instructional aides and community volunteers) who receive approximately two hours of training per year.

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|-------------------------|------------------|---------------------------------|---------|
| Taxpayers | \$1,194 | Benefit to cost ratio | \$2.66 |
| Participants | \$2,465 | Benefits minus costs | \$2,480 |
| Others | \$1,027 | Chance the program will produce | |
| Indirect | (\$715) | benefits greater than the costs | 72 % |
| <u>Total benefits</u> | <u>\$3,972</u> | | |
| <u>Net program cost</u> | <u>(\$1,492)</u> | | |
| Benefits minus cost | \$2,480 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|--|----------------|----------------|---------------------|-----------------------|----------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Labor market earnings associated with test scores | \$2,483 | \$1,128 | \$1,100 | \$0 | \$4,711 |
| Health care associated with educational attainment | (\$18) | \$67 | (\$73) | \$34 | \$10 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$748) | (\$748) |
| Totals | \$2,465 | \$1,194 | \$1,027 | (\$715) | \$3,972 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

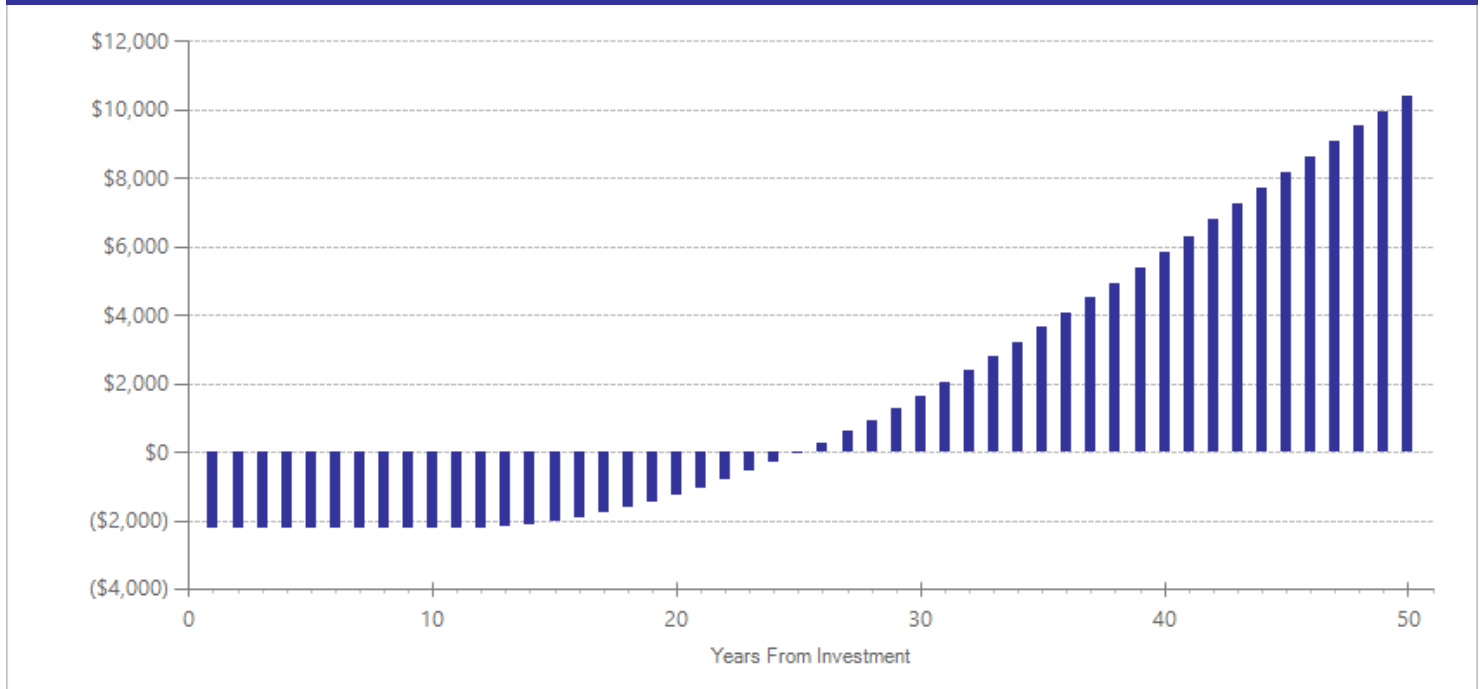
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|-----------|
| Program costs | \$1,425 | 2013 | Present value of net program costs (in 2017 dollars) | (\$1,492) |
| Comparison costs | \$0 | 2013 | Cost range (+ or -) | 10 % |

In the evaluations included in the meta-analysis, the average non-structured one-on-one tutoring program provides 30 hours of intervention per student and two hours of training time per tutor. The estimate assumed that certificated teachers provide approximately four hours of planning support and oversight. To calculate a per-student annual cost, we used average Washington State compensation costs (including benefits) for a K-8 teacher and instructional aides as reported by the Office of the Superintendent of Public Instruction.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|-------------------|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| Test scores | 7 | 12 | 6253 | 0.061 | 0.018 | 7 | 0.029 | 0.020 | 17 | 0.062 | 0.001 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

Citations Used in the Meta-Analysis

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Teacher performance pay programs Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated October 2015.

Program Description: Teacher performance pay programs distribute bonuses to individual teachers and sometimes to school wide staff. Performance is usually measured as value-added student test scores alone or in combination with some other assessment (such as principal evaluations). These evaluations examine the impact on student test scores from short-term, pilot performance pay programs.

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|-------------------------|----------------|---------------------------------|---------|
| Taxpayers | \$633 | Benefit to cost ratio | \$67.31 |
| Participants | \$1,308 | Benefits minus costs | \$2,449 |
| Others | \$546 | Chance the program will produce | |
| Indirect | (\$1) | benefits greater than the costs | 87 % |
| <u>Total benefits</u> | <u>\$2,486</u> | | |
| <u>Net program cost</u> | <u>(\$37)</u> | | |
| Benefits minus cost | \$2,449 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|--|----------------|--------------|---------------------|-----------------------|----------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Labor market earnings associated with test scores | \$1,317 | \$598 | \$584 | \$0 | \$2,500 |
| Health care associated with educational attainment | (\$10) | \$35 | (\$38) | \$17 | \$5 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$18) | (\$18) |
| Totals | \$1,308 | \$633 | \$546 | (\$1) | \$2,486 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

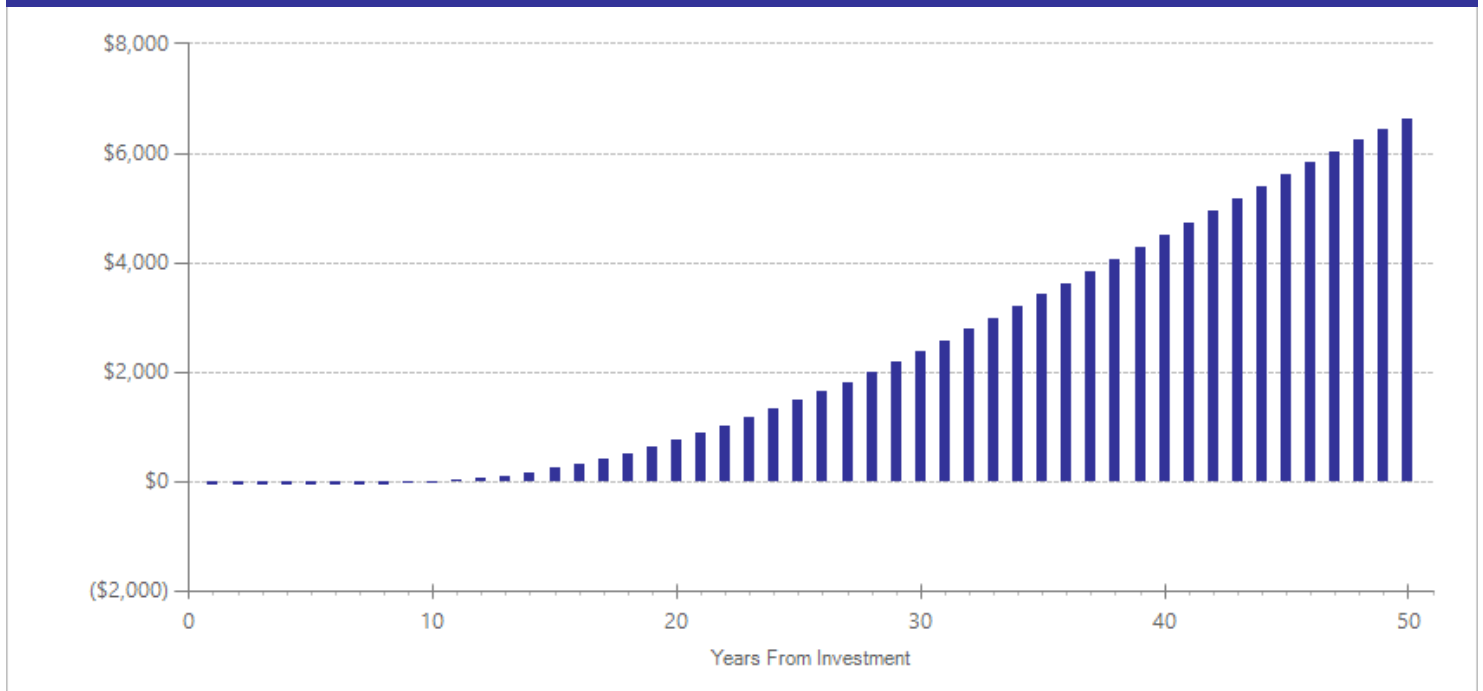
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|--------|
| Program costs | \$33 | 2010 | Present value of net program costs (in 2017 dollars) | (\$37) |
| Comparison costs | \$0 | 2010 | Cost range (+ or -) | 20 % |

The performance bonuses in the evaluated programs ranged from a minimum of \$1,500 to a maximum of \$15,000; in over half of the programs, the maximum award was \$3,000. For this estimate, we use the median bonus of approximately \$2,500 per teacher (including administrative costs), spread across 25 students.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|-------------------|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| Test scores | 10 | 28 | 652322 | 0.019 | 0.011 | 12 | 0.015 | 0.013 | 17 | 0.019 | 0.095 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

Citations Used in the Meta-Analysis

- Dee, T.S., & Keys, B.J. (2004). Does merit pay reward good teachers? Evidence from a randomized experiment. *Journal of Policy Analysis and Management*, 23(3), 471-488.
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- Goodman, S., & Turner, L. (2010). *Teacher incentive pay and educational outcomes: Evidence from the NYC Bonus Program*. Unpublished manuscript, Columbia University, New York.
- Hudson, S. (2010). *The effects of performance-based teacher pay on student achievement*. Discussion Paper for the Stanford Institute for Economic Policy Research, Stanford University. Retrieved from: http://www.stanford.edu/group/siepr/cgi-bin/siepr/?q=system/files/shared/pubs/papers/09-023_Paper_Hudson.pdf
- Marsh, J.A., Springer, M.G., & McCaffrey, D F. (2011). *A Big Apple for Educators: Final Evaluation Report*. Santa Monica: RAND Corp.

Becoming a Man (BAM) Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated April 2018.

Program Description: Becoming a Man (BAM) is a high school behavioral program that provides a non-academic intervention to disadvantaged and at-risk males through exposure to prosocial adults and skills training based on cognitive behavioral therapy. The program focuses on teaching character and social-emotional skills including considering another person's perspective, evaluating consequences ahead of time, and reducing automatic decision-making. Participants in this analysis attended weekly one-hour group sessions during the school day over the course of one academic school year.

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|-------------------------|------------------|---------------------------------|---------|
| Taxpayers | \$1,441 | Benefit to cost ratio | \$2.16 |
| Participants | \$1,126 | Benefits minus costs | \$2,390 |
| Others | \$2,482 | Chance the program will produce | |
| Indirect | (\$602) | benefits greater than the costs | 75 % |
| <u>Total benefits</u> | <u>\$4,447</u> | | |
| <u>Net program cost</u> | <u>(\$2,057)</u> | | |
| Benefits minus cost | \$2,390 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|--|----------------|----------------|---------------------|-----------------------|----------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Crime | \$0 | \$789 | \$2,138 | \$396 | \$3,324 |
| Labor market earnings associated with high school graduation | \$1,287 | \$585 | \$591 | \$0 | \$2,463 |
| Health care associated with educational attainment | (\$53) | \$194 | (\$212) | \$98 | \$27 |
| Costs of higher education | (\$108) | (\$127) | (\$35) | (\$64) | (\$334) |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$1,032) | (\$1,032) |
| <u>Totals</u> | <u>\$1,126</u> | <u>\$1,441</u> | <u>\$2,482</u> | <u>(\$602)</u> | <u>\$4,447</u> |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

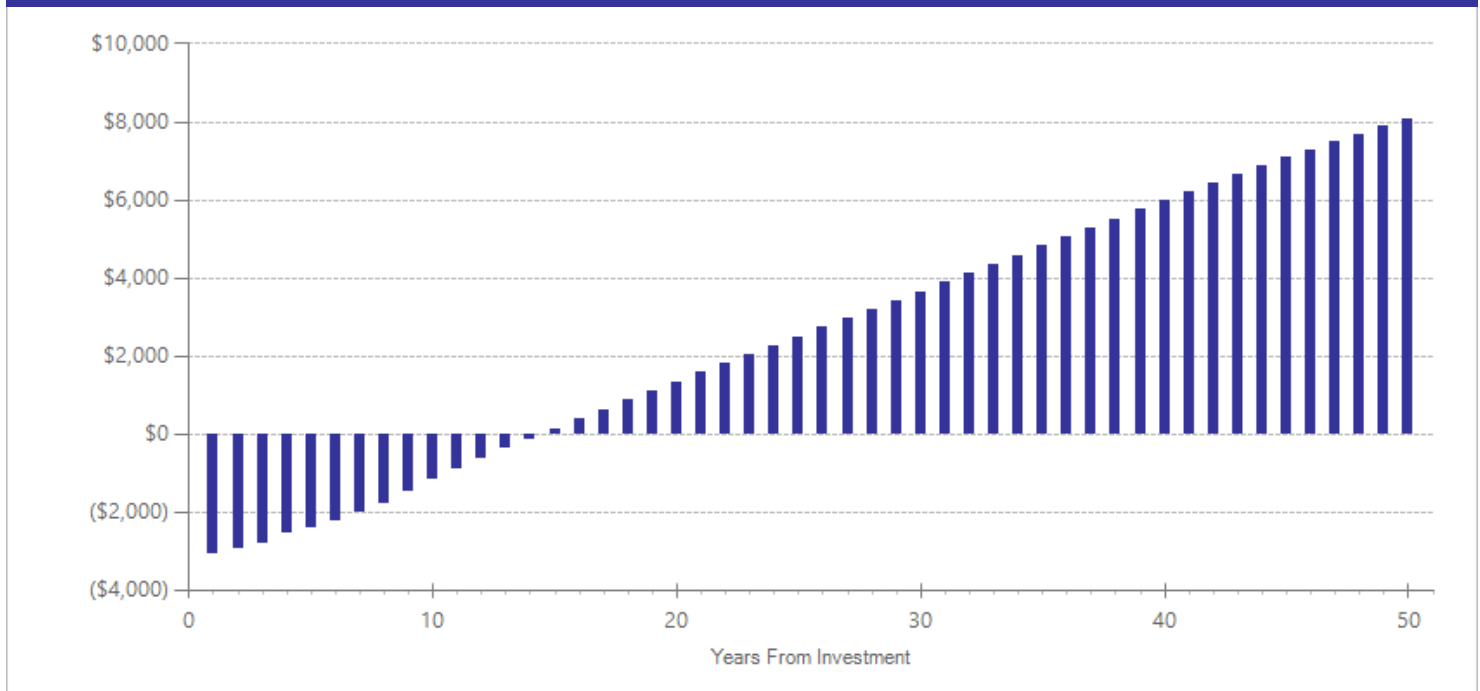
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|-----------|
| Program costs | \$2,000 | 2015 | Present value of net program costs (in 2017 dollars) | (\$2,057) |
| Comparison costs | \$0 | 2015 | Cost range (+ or -) | 10 % |

We used a per-participant program cost reported in Heller et al. (2015). Thinking, fast and slow: Some field experiments to reduce crime and dropout in Chicago (NBER Working Paper 21178). Cambridge, MA: National Bureau of Economic Research.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|----------------------------------|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| Crime | 14 | 1 | 1016 | -0.072 | 0.044 | 14 | -0.072 | 0.044 | 24 | -0.072 | 0.100 |
| Grade point average [^] | 14 | 1 | 1016 | -0.005 | 0.044 | 14 | n/a | n/a | n/a | -0.005 | 0.913 |
| School attendance [^] | 14 | 1 | 1016 | 0.010 | 0.044 | 14 | n/a | n/a | n/a | 0.010 | 0.815 |

[^]WSIPP’s benefit-cost model does not monetize this outcome.

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

Citations Used in the Meta-Analysis

Heller, S.B., Shah, A.K., Guryan, J., Ludwig, J., Mullainathan, S., & Pollack, H.A. (2015). *Thinking, fast and slow?: Some field experiments to reduce crime and dropout in Chicago* (NBER Working Paper 21178). Cambridge, MA: National Bureau of Economic Research.

Teacher professional development: Online, targeted

Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated June 2014.

Program Description: Generally, professional development (PD) for K–12 teachers includes activities such as workshops, conferences, summer institutes, and time set aside during the school year for staff development. Online, targeted PD provides online training and collaboration with a focus on improving teaching in a particular content area (such as reading, math, or science) and/or a particular grade level.

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|----------------------------|----------------|---------------------------------|---------|
| Taxpayers | \$604 | Benefit to cost ratio | \$7.34 |
| Participants | \$1,247 | Benefits minus costs | \$1,930 |
| Others | \$518 | Chance the program will produce | |
| Indirect | (\$134) | benefits greater than the costs | 60 % |
| Total benefits | \$2,235 | | |
| Net program cost | (\$304) | | |
| Benefits minus cost | \$1,930 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|--|----------------|--------------|---------------------|-----------------------|----------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Labor market earnings associated with test scores | \$1,256 | \$570 | \$555 | \$0 | \$2,381 |
| Health care associated with educational attainment | (\$9) | \$34 | (\$37) | \$17 | \$5 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$151) | (\$151) |
| Totals | \$1,247 | \$604 | \$518 | (\$134) | \$2,235 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²“Others” includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³“Indirect benefits” includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

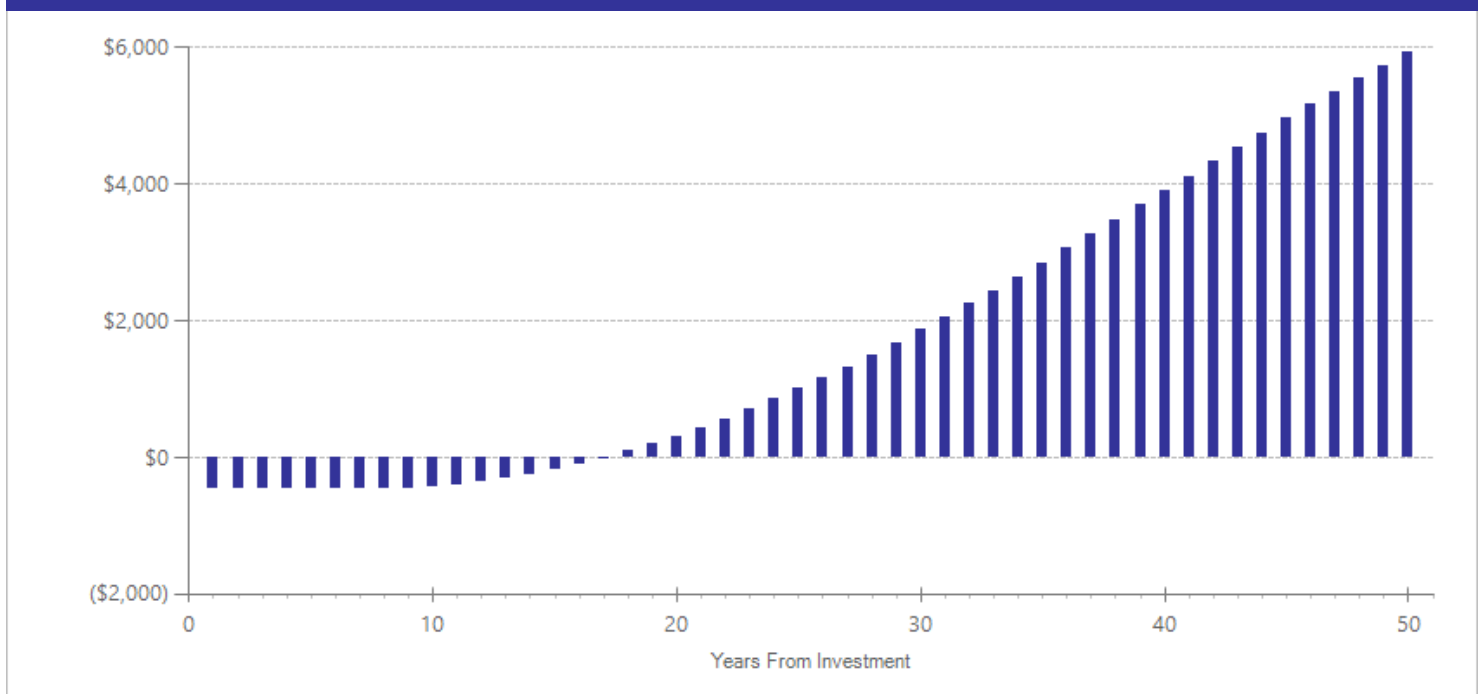
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|---------|
| Program costs | \$291 | 2013 | Present value of net program costs (in 2017 dollars) | (\$304) |
| Comparison costs | \$0 | 2013 | Cost range (+ or -) | 10 % |

In the evaluations included in the meta-analysis, teachers received an average of 70 additional hours of targeted online professional development (PD) in comparison with the usual amount of PD time. We calculated the value of PD time using average teacher salaries (including benefits) in Washington State as reported by the Office of Superintendent of Public Instruction. To calculate a per-student annual cost, we divided compensation costs by the number of students per classroom in Washington's prototypical schools formula and added per-student materials, supplies, and operating costs to account for the overhead (i.e. computer and administrative costs) associated with providing PD.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|-------------------|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| Test scores | 10 | 3 | 2245 | 0.020 | 0.037 | 11 | 0.014 | 0.041 | 17 | 0.143 | 0.002 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

Citations Used in the Meta-Analysis

- Dash, S., de, Kramer, R.M., O'Dwyer, L.M., Masters, J., & Russell, M. (2012). Impact of online professional development on teacher quality and student achievement in fifth grade mathematics. *Journal of Research on Technology in Education*, 45(1), 1-26.
- de Kramer, R.M., Masters, J., O'Dwyer, L.M., Dash, S., & Russell, M. (2012). Relationship of online teacher professional development to seventh-grade teachers' and students' knowledge and practices in English language arts. *Teacher Educator*, 47(3), 236-259.
- Masters, J., Magidin, K.R., O'Dwyer, L., Dash, S., & Russell, M. (2012). The effects of online teacher professional development on fourth grade students' knowledge and practices in English language arts. *Journal of Technology and Teacher Education*, 20(1), 21-46.

Summer book programs: One-year intervention Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated June 2014.

Program Description: The summer book programs included in this analysis provide free books to elementary school students. Generally, the goal of summer book programs is to increase print exposure, the number of books at home, and voluntary reading time. Books are matched to each student's reading level and area of interest and are mailed to students weekly over the summer break. The mailing includes a form for the student to complete after finishing the book. This analysis includes school-based programs only and does not include bookmobiles or public library programs. The studies included in this analysis measure the program's impact after one summer.

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|-------------------------|----------------|---------------------------------|---------|
| Taxpayers | \$518 | Benefit to cost ratio | \$24.87 |
| Participants | \$1,069 | Benefits minus costs | \$1,924 |
| Others | \$444 | Chance the program will produce | |
| Indirect | (\$26) | benefits greater than the costs | 57 % |
| <u>Total benefits</u> | <u>\$2,005</u> | | |
| <u>Net program cost</u> | <u>(\$81)</u> | | |
| Benefits minus cost | \$1,924 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|--|----------------|--------------|---------------------|-----------------------|----------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Labor market earnings associated with test scores | \$1,077 | \$489 | \$475 | \$0 | \$2,041 |
| Health care associated with educational attainment | (\$8) | \$29 | (\$31) | \$14 | \$4 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$41) | (\$41) |
| Totals | \$1,069 | \$518 | \$444 | (\$26) | \$2,005 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

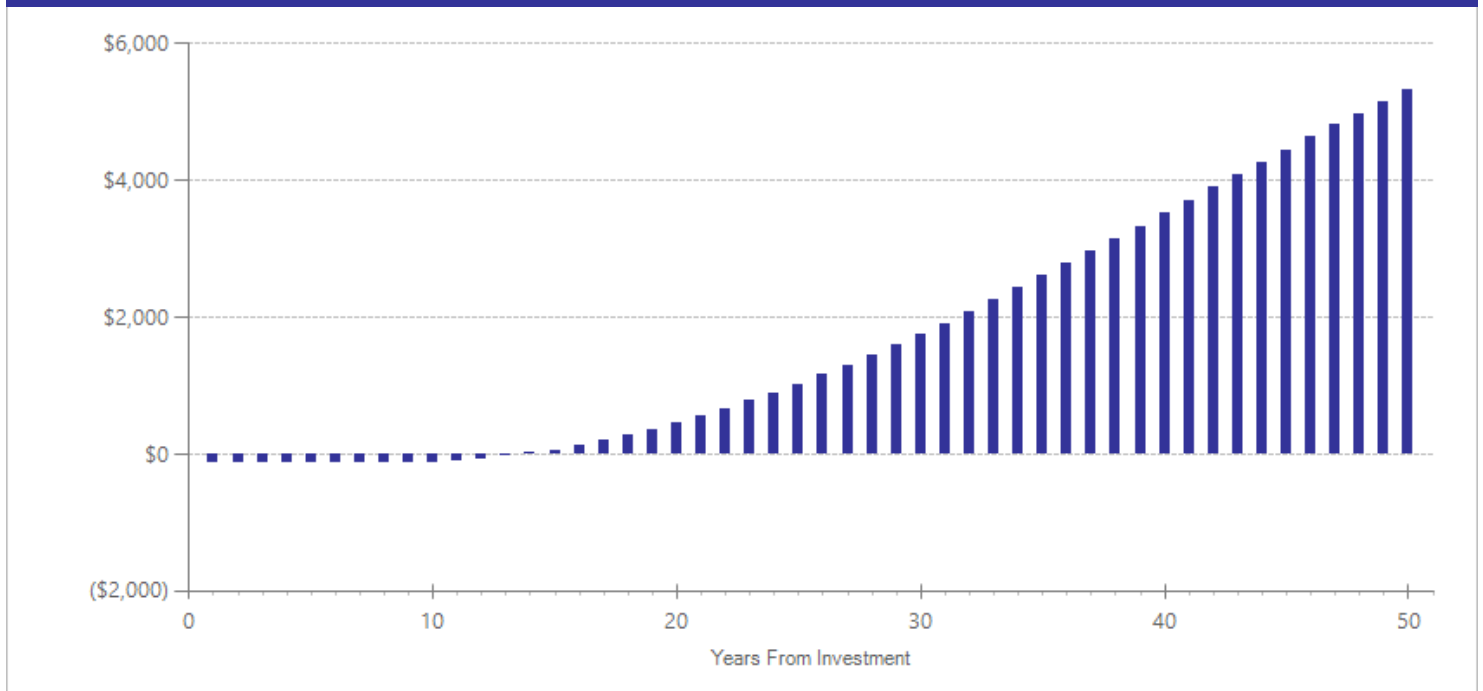
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|--------|
| Program costs | \$77 | 2013 | Present value of net program costs (in 2017 dollars) | (\$81) |
| Comparison costs | \$0 | 2013 | Cost range (+ or -) | 10 % |

To calculate a per-student annual cost, we used average Washington State compensation costs (including benefits) for a K–8 teacher as reported by the Office of the Superintendent of Public Instruction to account for the time it takes teachers to administer the program divided by the average number of students per classroom in Washington's prototypical schools formula. In addition to compensation, the estimate accounts for the cost of purchasing and shipping ten books to each student's home.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|-------------------|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| Test scores | 9 | 3 | 1018 | 0.019 | 0.061 | 10 | 0.013 | 0.067 | 17 | 0.019 | 0.752 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

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WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

Citations Used in the Meta-Analysis

- Kim, J.S. (2007). The effects of a voluntary summer reading intervention on reading activities and reading achievement. *Journal of Educational Psychology, 99*(3), 505-515.
- Kim, J.S., & White, T.G. (2008). Scaffolding voluntary summer reading for children in grades 3 to 5: An experimental study. *Scientific Studies of Reading, 12*(1), 1-23.
- Wilkins, C., Gersten, R., Decker, L. E., Grunden, L., Brasiel, S., Brunnert, K., & Jayanthi, M. (2012). *Does a Summer Reading Program Based on Lexiles Affect Reading Comprehension?* Final Report (NCEE 2012-4006). Washington DC: U.S. Department of Education, National Center for Education Evaluation and Regional Assistance.

Class size: reducing average class size by one student in kindergarten Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated January 2013.

Program Description: Washington State's prototypical school funding formula allocates funding for an average class size of 25.23 students in grades K–3 (RCW 28A.150.260). We estimate the benefits and costs of reducing kindergarten average class sizes by one student.

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|----------------------|---------------|---------------------------------|---------|
| Taxpayers | \$542 | Benefit to cost ratio | \$7.81 |
| Participants | \$887 | Benefits minus costs | \$1,456 |
| Others | \$286 | Chance the program will produce | |
| Indirect | (\$45) | benefits greater than the costs | 94 % |
| <hr/> Total benefits | <hr/> \$1,670 | | |
| Net program cost | (\$214) | | |
| Benefits minus cost | \$1,456 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|--|--------------|-------------|---------------------|-----------------------|---------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Crime | \$0 | \$4 | \$8 | \$2 | \$14 |
| Labor market earnings associated with test scores | \$920 | \$418 | \$407 | \$0 | \$1,745 |
| Health care associated with educational attainment | (\$33) | \$120 | (\$130) | \$61 | \$18 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$107) | (\$107) |
| <hr/> Totals | <hr/> \$887 | <hr/> \$542 | <hr/> \$286 | <hr/> (\$45) | <hr/> \$1,670 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

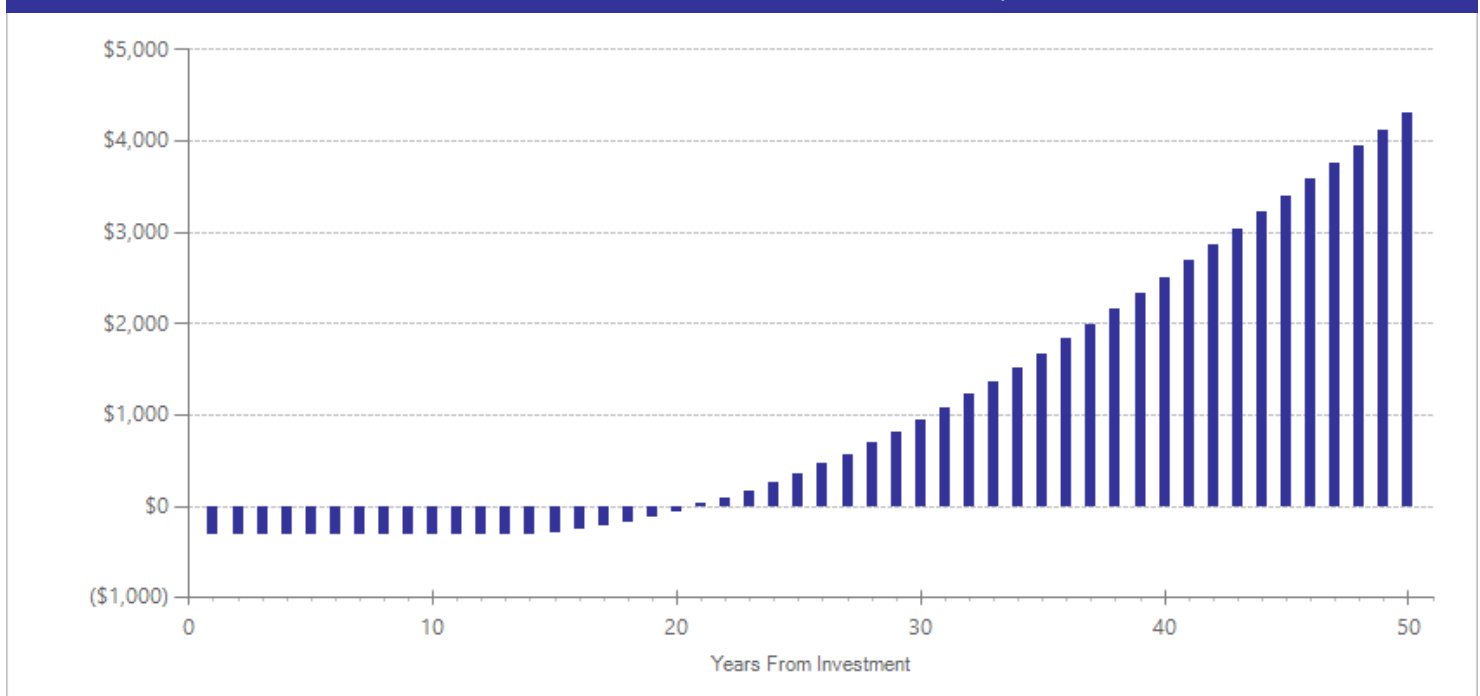
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|---------|
| Program costs | \$198 | 2011 | Present value of net program costs (in 2017 dollars) | (\$214) |
| Comparison costs | \$0 | 2011 | Cost range (+ or -) | 0 % |

The cost estimate accounts for state and school district teacher compensation, marginal operating, and capital costs. Annual teacher costs were calculated using the 2011-12 average total (state and local) salary for Washington certificated teachers reported in the Office of Superintendent of Public Instruction School District Personnel Summary Profiles. The calculation included salaries and benefits as well as central administration and special education costs. Assumptions for capital cost calculations were provided by legislative staff, with one exception: the interest rate on bonds is from the Federal Reserve's November 2012 state and local rate. Aos, S., & Pennucci, A. (2013). *K-12 class size reductions and student outcomes: A review of the evidence and benefit-cost analysis* (Doc. No. 13-01-2201). Olympia: Washington State Institute for Public Policy.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|------------------------|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| High school graduation | 5 | 77 | 1000 | 0.015 | 0.005 | 5 | 0.015 | 0.005 | 18 | 0.015 | 0.005 |
| Test scores | 5 | 77 | 1000 | 0.036 | 0.013 | 5 | 0.011 | 0.005 | 17 | 0.036 | 0.005 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

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First Step to Success Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated May 2015.

Program Description: First Step to Success is an early intervention program for students at risk for behavior problems. The program has three components: universal screening, classroom intervention, and home-based intervention. In the classroom intervention, behavior coaches and teachers provide visual cues to identified students to indicate when the student is on-task and exhibiting appropriate behaviors. Students earn points and may receive rewards if they meet their daily goal. In the home-based component, the behavior coach conducts six weekly home-visits and works with families to teach parenting skills and encourage collaboration between the home and the school. The intervention typically runs for three months.

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|----------------------------|----------------|---------------------------------|---------|
| Taxpayers | \$588 | Benefit to cost ratio | \$3.27 |
| Participants | \$1,205 | Benefits minus costs | \$1,386 |
| Others | \$493 | Chance the program will produce | |
| Indirect | (\$289) | benefits greater than the costs | 53 % |
| Total benefits | \$1,997 | | |
| Net program cost | (\$611) | | |
| Benefits minus cost | \$1,386 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|--|----------------|--------------|---------------------|-----------------------|----------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Labor market earnings associated with test scores | \$1,215 | \$552 | \$532 | \$0 | \$2,299 |
| Health care associated with educational attainment | (\$10) | \$36 | (\$39) | \$18 | \$5 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$306) | (\$306) |
| Totals | \$1,205 | \$588 | \$493 | (\$289) | \$1,997 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

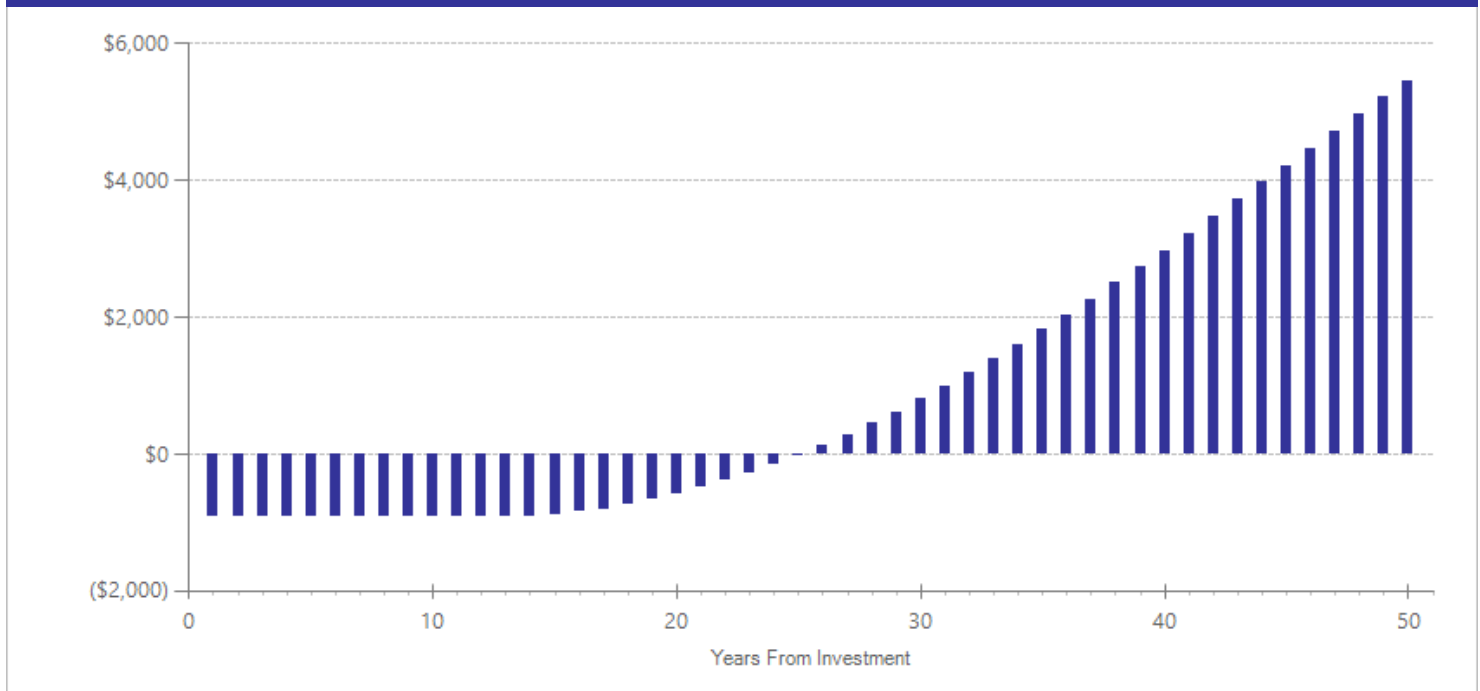
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|---------|
| Program costs | \$500 | 2005 | Present value of net program costs (in 2017 dollars) | (\$611) |
| Comparison costs | \$0 | 2005 | Cost range (+ or -) | 10 % |

This program is typically implemented over a three-month period. Per-student cost information is based on program materials and behavior coach time, as documented in Walker, H.M., Golly, A., McLane, J.Z., & Kimmich, M. (2005). The Oregon First Step to Success replication initiative: Statewide results of an evaluation of program's impact. *Journal of Emotional and Behavioral Disorders, 13*(3), 163–172.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|---------------------------------------|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| Disruptive behavior disorder symptoms | 5 | 1 | 23 | -0.105 | 0.298 | 5 | n/a | n/a | n/a | -1.066 | 0.001 |
| Test scores | 5 | 2 | 243 | 0.033 | 0.114 | 8 | 0.018 | 0.125 | 17 | 0.022 | 0.847 |

^^WSIPP does not include this outcome when conducting benefit-cost analysis for this program.

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

Citations Used in the Meta-Analysis

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Tutoring: Supplemental Educational Services (under Title I)

Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated May 2015.

Program Description: Current federal education law directs school districts who do not make "Adequate Yearly Progress" toward student proficiency standards to provide "Supplemental Educational Services"—primarily out-of-school-time tutoring—to eligible students at no charge to students and their families. Providers of SES include local and national for-profit and non-profit organizations as well as school districts themselves (unless they are identified as "in need of improvement" under AYP or have a waiver). Delivery methods (e.g., one-on-one, group, or online) vary; the amount of tutoring ranges from approximately 20 to 40 hours. This analysis estimates the impact of offering SES in school districts throughout the United States on reading and math test scores.

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|-------------------------|------------------|---------------------------------|---------|
| Taxpayers | \$933 | Benefit to cost ratio | \$1.60 |
| Participants | \$1,871 | Benefits minus costs | \$1,027 |
| Others | \$760 | Chance the program will produce | |
| Indirect | (\$819) | benefits greater than the costs | 62 % |
| <u>Total benefits</u> | <u>\$2,744</u> | | |
| <u>Net program cost</u> | <u>(\$1,717)</u> | | |
| Benefits minus cost | \$1,027 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|--|----------------|--------------|---------------------|-----------------------|----------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Labor market earnings associated with test scores | \$1,891 | \$859 | \$840 | \$0 | \$3,590 |
| Health care associated with educational attainment | (\$20) | \$74 | (\$80) | \$37 | \$10 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$856) | (\$856) |
| Totals | \$1,871 | \$933 | \$760 | (\$819) | \$2,744 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

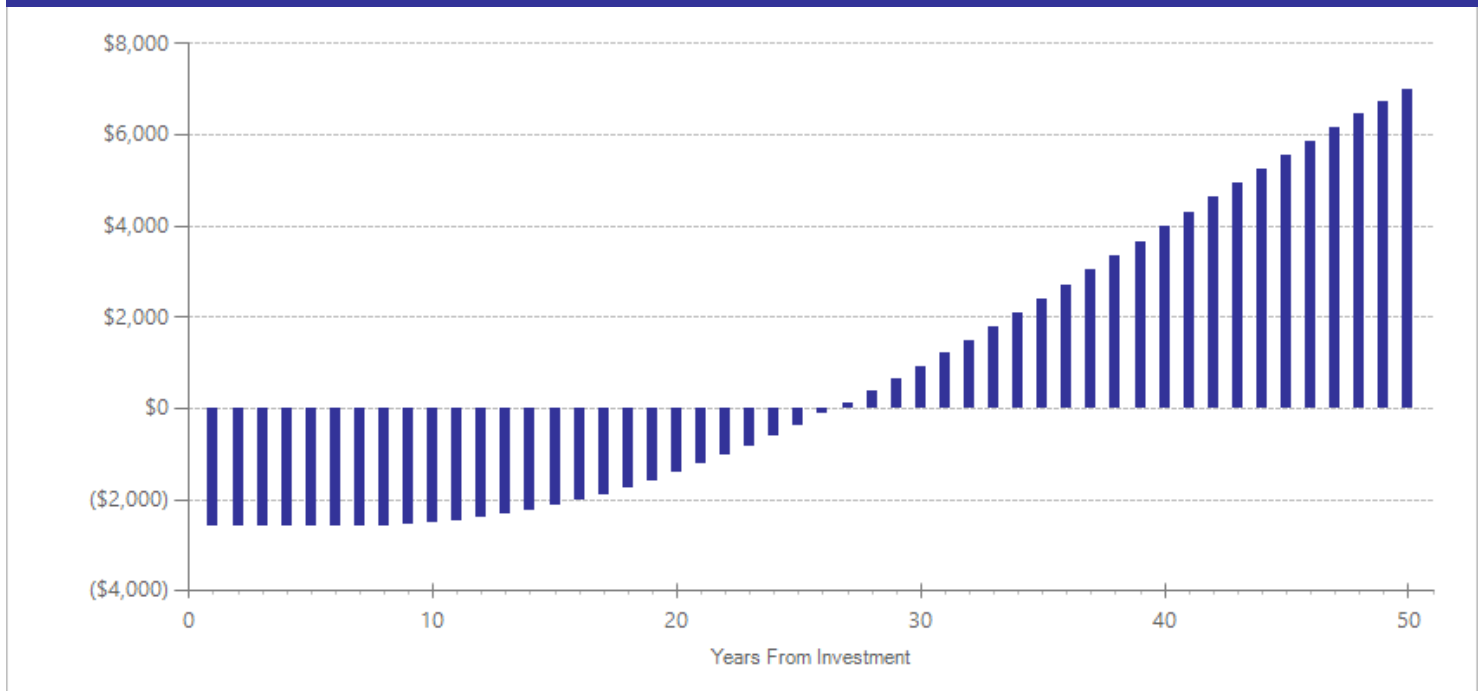
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|-----------|
| Program costs | \$1,550 | 2010 | Present value of net program costs (in 2017 dollars) | (\$1,717) |
| Comparison costs | \$0 | 2010 | Cost range (+ or -) | 30 % |

Average costs are estimated in the range (\$1,100 to \$2,000) reported in Heinrich, C.J., Burch, P., Good, A., Acosta, R., Cheng, H., Dillender, M., Kirshbaum, C., . . . Stewart, M. (2014). Improving the implementation and effectiveness of out-of-school time tutoring. *Journal of Policy Analysis and Management*, 1-34.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|-------------------|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| Test scores | 10 | 22 | 293256 | 0.029 | 0.010 | 11 | 0.021 | 0.011 | 17 | 0.029 | 0.006 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

Citations Used in the Meta-Analysis

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Class size: reducing average class size by one student in grade 1 Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated January 2013.

Program Description: Washington State's prototypical school funding formula allocates funding for an average class size of 25.23 students in grades K–3 (RCW 28A.150.260). We estimate the benefits and costs of reducing 1st grade average class sizes by one student.

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|-------------------------|----------------|---------------------------------|--------|
| Taxpayers | \$351 | Benefit to cost ratio | \$5.10 |
| Participants | \$604 | Benefits minus costs | \$877 |
| Others | \$208 | Chance the program will produce | |
| Indirect | (\$73) | benefits greater than the costs | 84 % |
| <u>Total benefits</u> | <u>\$1,091</u> | | |
| <u>Net program cost</u> | <u>(\$214)</u> | | |
| Benefits minus cost | \$877 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|--|--------------|--------------|---------------------|-----------------------|----------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Crime | \$0 | \$2 | \$5 | \$1 | \$8 |
| Labor market earnings associated with test scores | \$622 | \$283 | \$275 | \$0 | \$1,180 |
| Health care associated with educational attainment | (\$18) | \$66 | (\$72) | \$33 | \$9 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$107) | (\$107) |
| Totals | \$604 | \$351 | \$208 | (\$73) | \$1,091 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

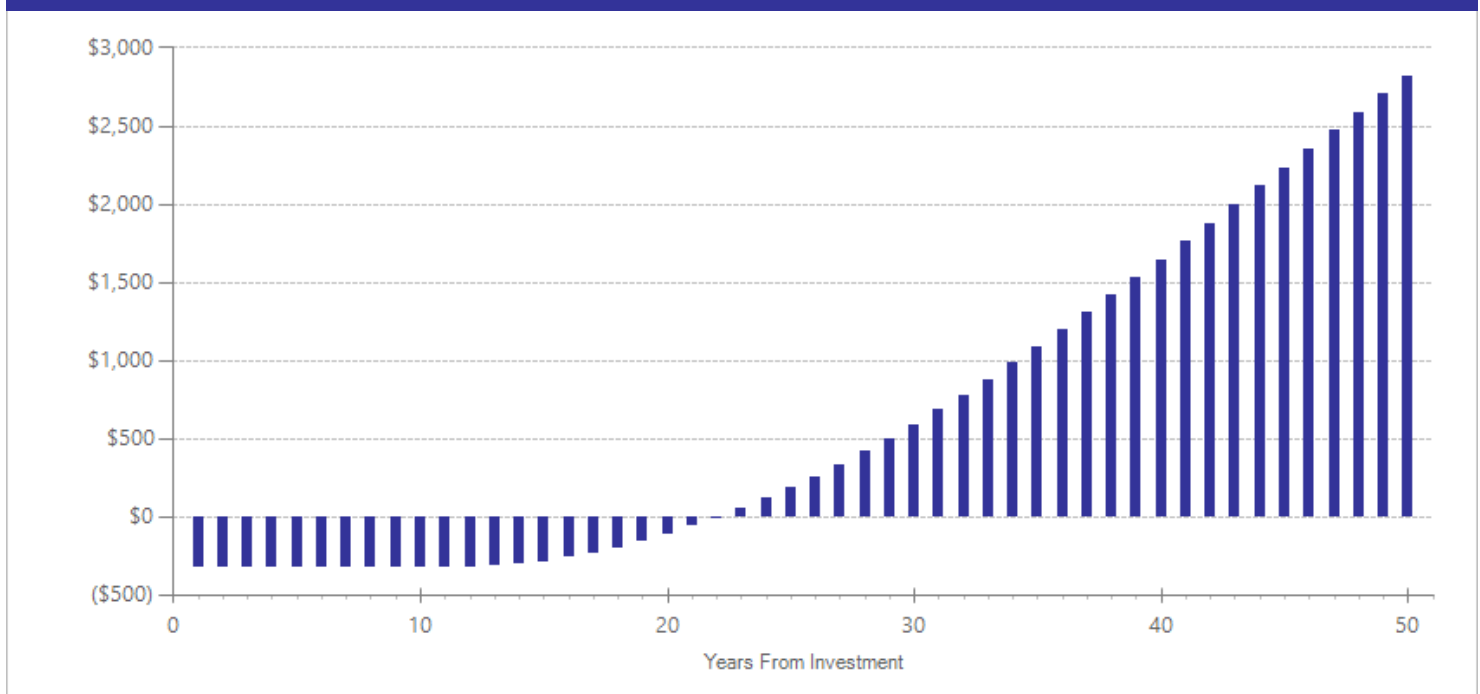
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|---------|
| Program costs | \$198 | 2011 | Present value of net program costs (in 2017 dollars) | (\$214) |
| Comparison costs | \$0 | 2011 | Cost range (+ or -) | 10 % |

The cost estimate accounts for state and school district teacher compensation, marginal operating, and capital costs. Annual teacher costs were calculated using the 2011-12 average total (state and local) salary for Washington certificated teachers reported in the Office of Superintendent of Public Instruction School District Personnel Summary Profiles. The calculation includes salaries and benefits as well as central administration and special education costs. Assumptions for capital cost calculations were provided by legislative staff, with one exception: the interest rate on bonds is from the Federal Reserve's November 2012 state and local rate. Aos, S., & Pennucci, A. (2013). *K-12 class size reductions and student outcomes: A review of the evidence and benefit-cost analysis* (Doc. No. 13-01-2201). Olympia: Washington State Institute for Public Policy.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|------------------------|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| High school graduation | 6 | 77 | 1000 | 0.008 | 0.004 | 6 | 0.008 | 0.004 | 18 | 0.008 | 0.163 |
| Test scores | 6 | 77 | 1000 | 0.018 | 0.010 | 6 | 0.007 | 0.005 | 17 | 0.018 | 0.059 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

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Summer book programs: One-year intervention, with additional support Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated June 2014.

Program Description: The summer book programs included in this analysis provide free books to elementary school students paired with additional reading support (e.g., lessons from certified teachers). Generally, the goal of summer book programs is to increase print exposure, the number of books at home, and voluntary reading time. Books are matched to each student's reading level and area of interest and are mailed to students weekly over the summer break. The mailing includes a form for the student to complete after finishing the book. This analysis includes school-based programs only and does not include bookmobiles or public library programs. The studies included in this analysis measure the program's impact after one summer.

Benefit-Cost Summary Statistics Per Participant

Benefits to:

| | | | |
|-------------------------|----------------|---------------------------------|--------|
| Taxpayers | \$250 | Benefit to cost ratio | \$7.79 |
| Participants | \$515 | Benefits minus costs | \$810 |
| Others | \$217 | Chance the program will produce | |
| Indirect | (\$53) | benefits greater than the costs | 56 % |
| <u>Total benefits</u> | <u>\$929</u> | | |
| <u>Net program cost</u> | <u>(\$119)</u> | | |
| Benefits minus cost | \$810 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to:¹

Benefits to:

| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
|--|--------------|--------------|---------------------|-----------------------|--------------|
| Labor market earnings associated with test scores | \$519 | \$236 | \$233 | \$0 | \$987 |
| Health care associated with educational attainment | (\$4) | \$14 | (\$16) | \$7 | \$2 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$60) | (\$60) |
| Totals | \$515 | \$250 | \$217 | (\$53) | \$929 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

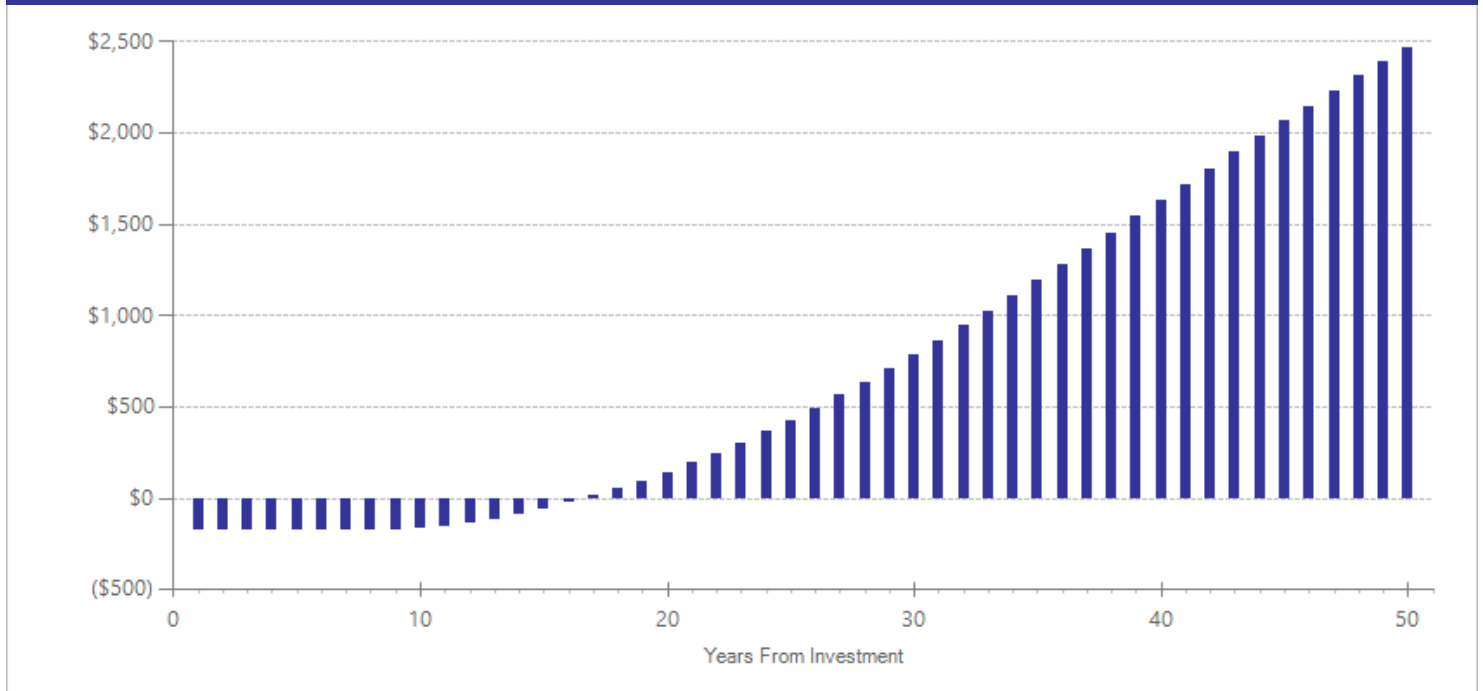
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|---------|
| Program costs | \$114 | 2013 | Present value of net program costs (in 2017 dollars) | (\$119) |
| Comparison costs | \$0 | 2013 | Cost range (+ or -) | 10 % |

To calculate a per-student annual cost, we used average Washington State compensation costs (including benefits) for a K–8 teacher as reported by the Office of the Superintendent of Public Instruction to account for class time and time to administer the program divided by the average number of students per classroom in Washington’s prototypical schools formula. In addition to compensation, the estimate accounts for the cost of purchasing and shipping ten books to each student’s home. The costs do not include parent time for involvement in reading instruction.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|-------------------|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| Test scores | 10 | 5 | 3340 | 0.010 | 0.026 | 10 | 0.007 | 0.029 | 17 | 0.021 | 0.419 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

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Second Step Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated May 2015.

Program Description: Second Step is a classroom-based social skills program for reducing aggressive behavior in elementary school-aged children. Second Step focuses on teaching social-emotional competencies and self-regulation skills including nonviolent response techniques. Lessons are taught by a trained teacher in a classroom setting.

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|-------------------------|----------------|---------------------------------|--------|
| Taxpayers | \$213 | Benefit to cost ratio | \$4.69 |
| Participants | \$110 | Benefits minus costs | \$452 |
| Others | \$186 | Chance the program will produce | |
| Indirect | \$65 | benefits greater than the costs | 79 % |
| <u>Total benefits</u> | <u>\$574</u> | | |
| <u>Net program cost</u> | <u>(\$122)</u> | | |
| Benefits minus cost | \$452 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|--|--------------|--------------|---------------------|-----------------------|--------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Crime | \$0 | \$14 | \$31 | \$7 | \$52 |
| Labor market earnings associated with high school graduation | \$88 | \$40 | \$40 | \$40 | \$208 |
| K-12 special education | \$0 | \$52 | \$0 | \$26 | \$77 |
| Health care associated with externalizing behavior symptoms | \$32 | \$114 | \$117 | \$57 | \$320 |
| Costs of higher education | (\$10) | (\$7) | (\$3) | (\$3) | (\$23) |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$61) | (\$61) |
| Totals | \$110 | \$213 | \$186 | \$65 | \$574 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

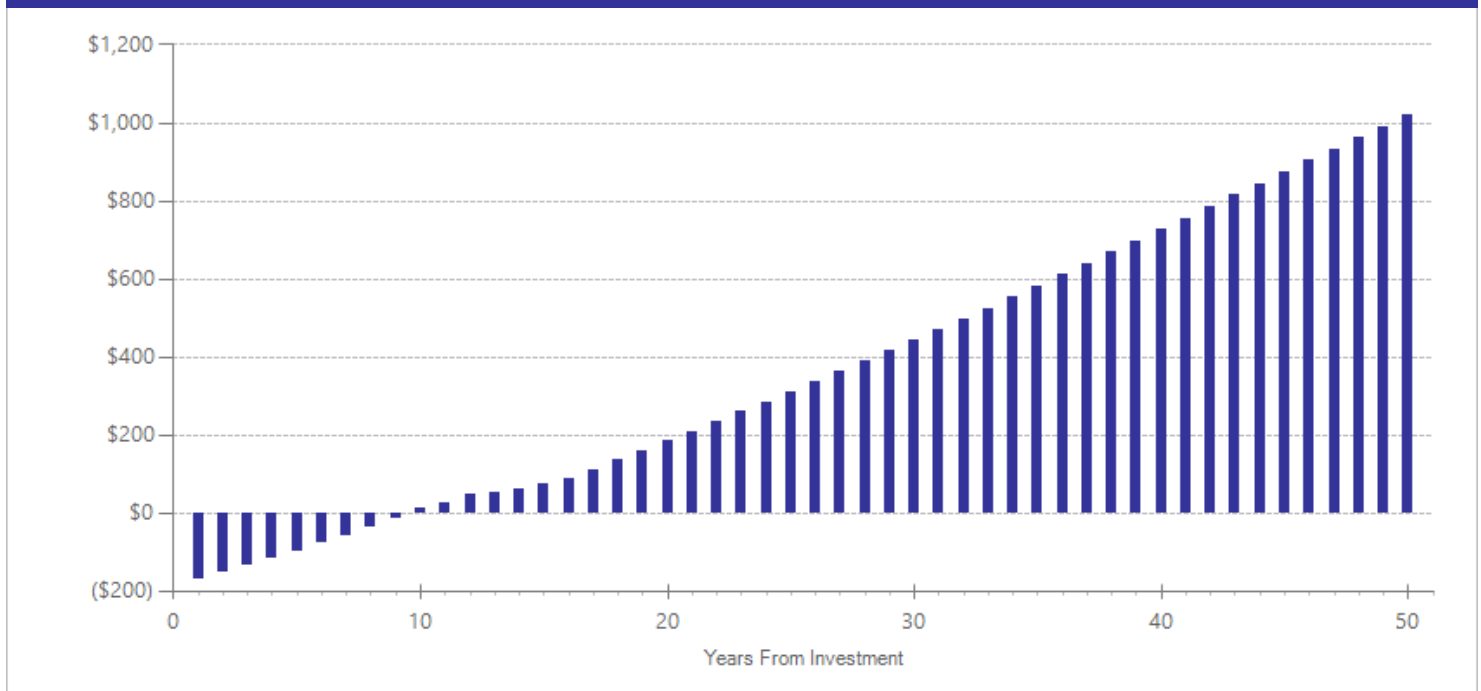
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|---------|
| Program costs | \$117 | 2013 | Present value of net program costs (in 2017 dollars) | (\$122) |
| Comparison costs | \$0 | 2013 | Cost range (+ or -) | 10 % |

To estimate costs, we assume that teachers spend an average of 15 hours teaching Second Step lessons (30 sessions of 30 minutes) and attend a two-day training. To estimate a per-student annual cost, we calculated the value of teacher time using average Washington State compensation costs (including benefits) for a K-8 teacher as reported by the Office of the Superintendent of Public Instruction and divide by the number of students in a prototypical elementary school. The estimate also includes curriculum cost as reported by Second Step (<https://store.cfchildren.org/elementary-kindergarten--grade-5-c29.aspx>) and registration costs for teachers to attend two days of training (<http://legacy.nreppadmin.net/ViewIntervention.aspx?id=66>).

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|---|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| Attention-deficit/hyperactivity disorder symptoms | 6 | 1 | 3637 | -0.108 | 0.024 | 6 | 0.000 | 0.141 | 7 | -0.108 | 0.001 |
| Externalizing behavior symptoms | 6 | 3 | 4214 | -0.060 | 0.041 | 7 | -0.033 | 0.028 | 10 | -0.060 | 0.172 |
| School attendance [^] | 6 | 1 | 1074 | 0.203 | 0.144 | 10 | n/a | n/a | n/a | 0.203 | 0.159 |
| Suspensions/expulsions [^] | 6 | 1 | 1074 | 0.028 | 0.144 | 10 | n/a | n/a | n/a | 0.028 | 0.849 |

[^]WSIPP's benefit-cost model does not monetize this outcome.

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

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Per-pupil expenditures: 10% increase for one student cohort from kindergarten through grade 12

Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated April 2012.

Program Description: In the 2011-12 school year, Washington State school districts spent an average of \$9,739 per public school student (including state, federal, local, and other sources). This analysis estimates the benefits and costs for increasing per-pupil expenditures by 10% for one cohort of students starting in kindergarten and continuing those increased expenditures for 13 years (grades K through 12).

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|----------------------------|-------------------|---------------------------------|--------|
| Taxpayers | \$4,899 | Benefit to cost ratio | \$1.04 |
| Participants | \$8,809 | Benefits minus costs | \$435 |
| Others | \$3,218 | Chance the program will produce | |
| Indirect | (\$5,257) | benefits greater than the costs | 46 % |
| Total benefits | \$11,669 | | |
| Net program cost | (\$11,234) | | |
| Benefits minus cost | \$435 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|--|----------------|----------------|---------------------|-----------------------|-----------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Crime | \$0 | \$27 | \$54 | \$13 | \$94 |
| Labor market earnings associated with test scores | \$9,020 | \$4,096 | \$4,006 | \$0 | \$17,123 |
| Health care associated with educational attainment | (\$212) | \$776 | (\$843) | \$391 | \$113 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$5,662) | (\$5,662) |
| Totals | \$8,809 | \$4,899 | \$3,218 | (\$5,257) | \$11,669 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

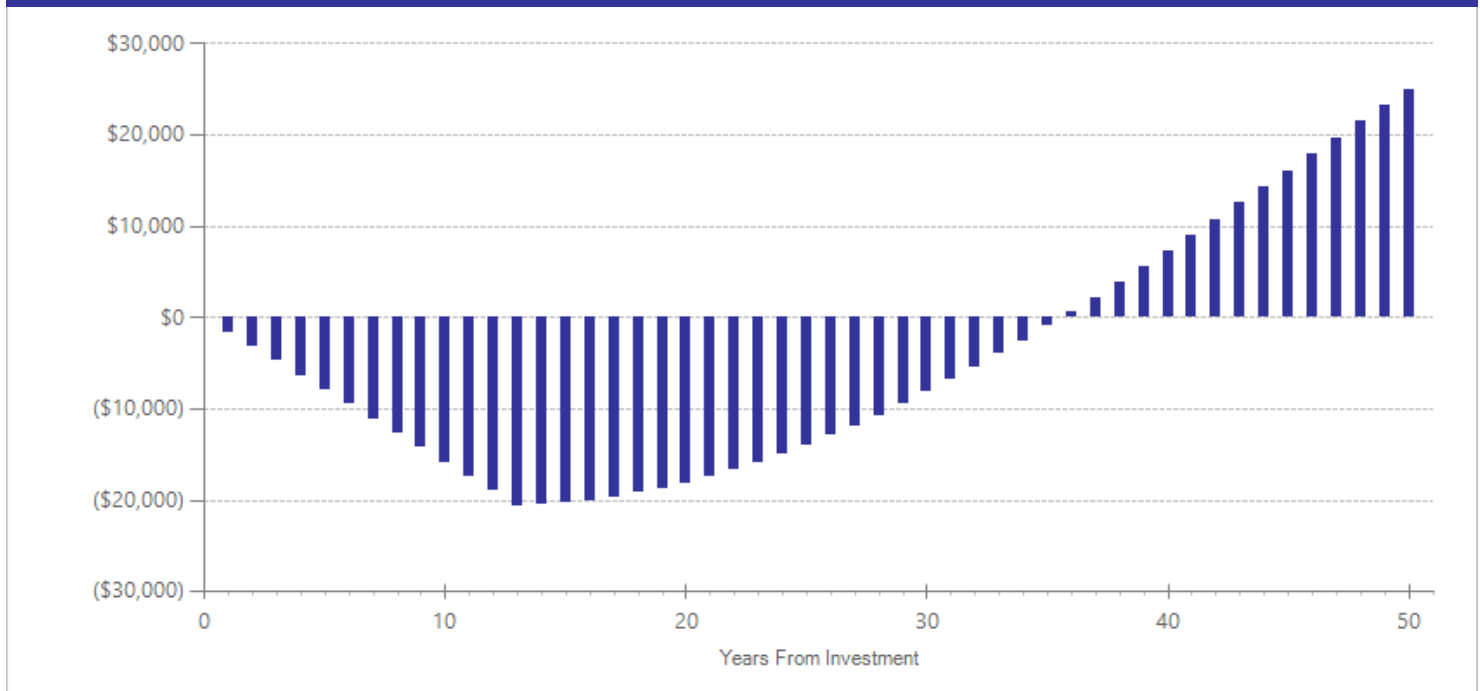
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|------------|
| Program costs | \$974 | 2011 | Present value of net program costs (in 2017 dollars) | (\$11,234) |
| Comparison costs | \$0 | 2011 | Cost range (+ or -) | 0 % |

Office of Superintendent of Public Instruction (2013). Financial Reporting Summary, Washington State School Districts and Educational Service Districts, Fiscal Year 9/2011-8/2012. The estimated per-pupil annual cost equals 10% of the total per-pupil expenditures reported in Table 7. <http://www.k12.wa.us/safs/PUB/FIN/1112/2011-12%20Financial%20Reporting%20Summary.pdf>

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|------------------------|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| High school graduation | 5 | 40 | 1000 | 0.101 | 0.042 | 16 | 0.101 | 0.042 | 20 | 0.101 | 0.050 |
| Test scores | 5 | 40 | 1000 | 0.120 | 0.055 | 16 | 0.109 | 0.047 | 18 | 0.120 | 0.050 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

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Class size: reducing average class size by one student in grade 2 Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated January 2013.

Program Description: Washington State's prototypical school funding formula allocates funding for an average class size of 25.23 students in grades K–3 (RCW 28A.150.260). We estimate the benefits and costs of reducing 2nd grade average class sizes by one student.

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|---------------------|---------|---------------------------------|--------|
| Taxpayers | \$218 | Benefit to cost ratio | \$3.03 |
| Participants | \$381 | Benefits minus costs | \$433 |
| Others | \$134 | Chance the program will produce | |
| Indirect | (\$87) | benefits greater than the costs | 68 % |
| Total benefits | \$647 | | |
| Net program cost | (\$214) | | |
| Benefits minus cost | \$433 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|--|--------------|-----------|---------------------|-----------------------|---------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Crime | \$0 | \$1 | \$3 | \$1 | \$5 |
| Labor market earnings associated with test scores | \$392 | \$178 | \$174 | \$0 | \$744 |
| Health care associated with educational attainment | (\$11) | \$39 | (\$43) | \$20 | \$5 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$107) | (\$107) |
| Totals | \$381 | \$218 | \$134 | (\$87) | \$647 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

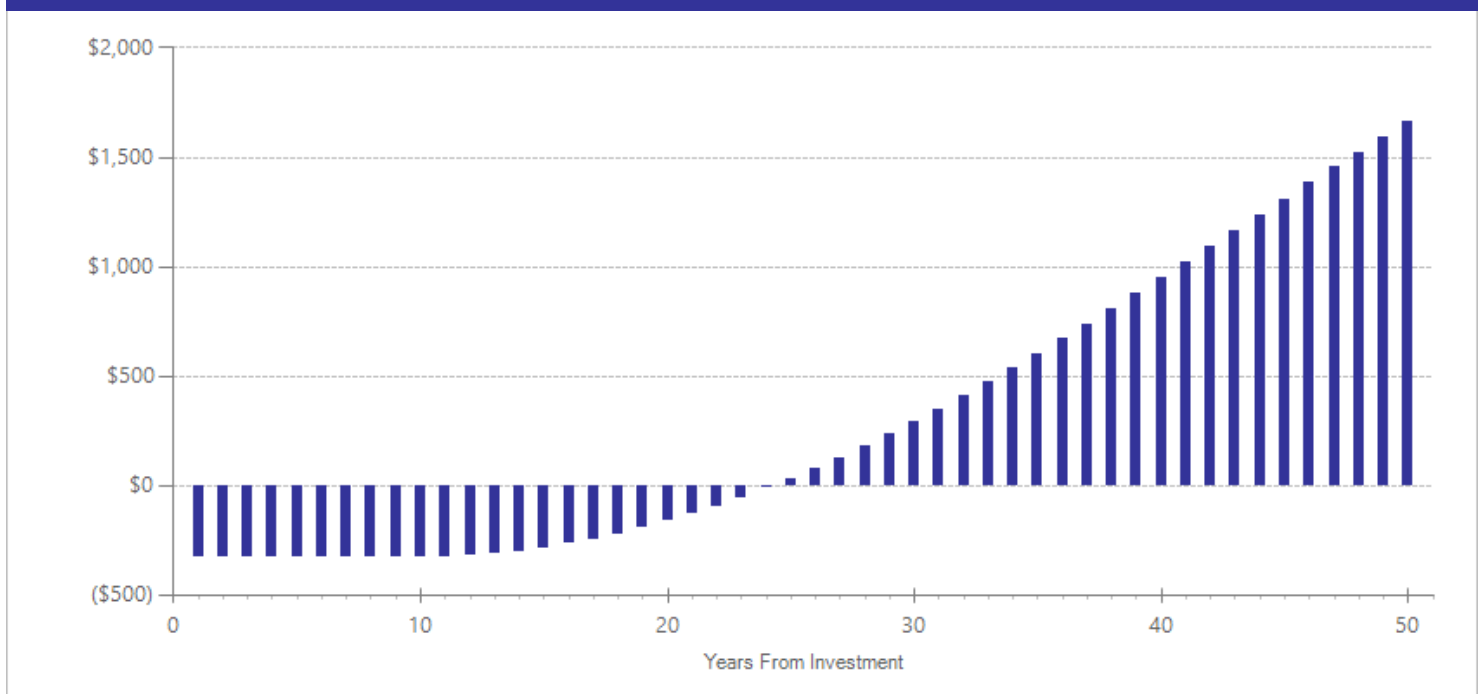
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|---------|
| Program costs | \$198 | 2011 | Present value of net program costs (in 2017 dollars) | (\$214) |
| Comparison costs | \$0 | 2011 | Cost range (+ or -) | 0 % |

The cost estimate accounts for state and school district teacher compensation, marginal operating, and capital costs. Annual teacher costs are calculated using the 2011-12 average total (state and local) salary for Washington certificated teachers reported in the Office of Superintendent of Public Instruction School District Personnel Summary Profiles. The calculation includes salaries and benefits as well as central administration and special education costs. Assumptions for capital cost calculations were provided by legislative staff, with one exception: the interest rate on bonds is from the Federal Reserve's November 2012 state and local rate. Aos, S., & Pennucci, A. (2013). *K-12 class size reductions and student outcomes: A review of the evidence and benefit-cost analysis* (Doc. No. 13-01-2201). Olympia: Washington State Institute for Public Policy.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|------------------------|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| High school graduation | 7 | 77 | 1000 | 0.005 | 0.004 | 7 | 0.005 | 0.004 | 18 | 0.005 | 0.204 |
| Test scores | 7 | 77 | 1000 | 0.010 | 0.009 | 7 | 0.005 | 0.005 | 17 | 0.010 | 0.286 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

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Class size: reducing average class size by one student in grade 3 Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated January 2013.

Program Description: Washington State's prototypical school funding formula allocates funding for an average class size of 25.23 students in grades K–3 (RCW 28A.150.260). We estimate the benefits and costs of reducing 3rd grade average class sizes by one student.

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|-------------------------|----------------|---------------------------------|--------|
| Taxpayers | \$175 | Benefit to cost ratio | \$2.35 |
| Participants | \$308 | Benefits minus costs | \$288 |
| Others | \$110 | Chance the program will produce | |
| Indirect | (\$92) | benefits greater than the costs | 61 % |
| <u>Total benefits</u> | <u>\$502</u> | | |
| <u>Net program cost</u> | <u>(\$214)</u> | | |
| Benefits minus cost | \$288 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|--|--------------|--------------|---------------------|-----------------------|--------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Crime | \$0 | \$1 | \$2 | \$1 | \$4 |
| Labor market earnings associated with test scores | \$317 | \$144 | \$140 | \$0 | \$601 |
| Health care associated with educational attainment | (\$8) | \$30 | (\$33) | \$15 | \$4 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$107) | (\$107) |
| Totals | \$308 | \$175 | \$110 | (\$92) | \$502 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

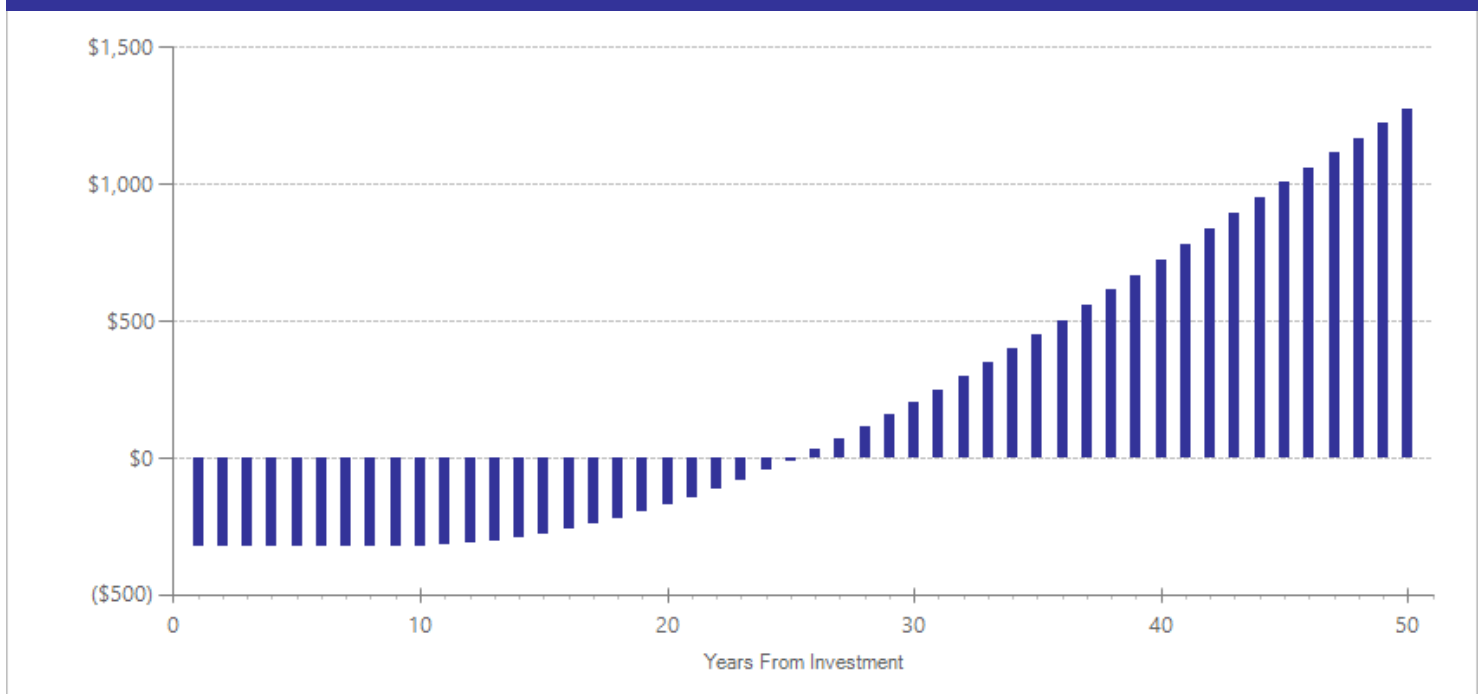
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|---------|
| Program costs | \$198 | 2011 | Present value of net program costs (in 2017 dollars) | (\$214) |
| Comparison costs | \$0 | 2011 | Cost range (+ or -) | 0 % |

The cost estimate accounts for state and school district teacher compensation, marginal operating, and capital costs. Annual teacher costs are calculated using the 2011-12 average total (state and local) salary for Washington certificated teachers reported in the Office of Superintendent of Public Instruction School District Personnel Summary Profiles. The calculation includes salaries and benefits as well as central administration and special education costs. Assumptions for capital cost calculations were provided by legislative staff, with one exception: the interest rate on bonds is from the Federal Reserve's November 2012 state and local rate. Aos, S., & Pennucci, A. (2013). *K-12 class size reductions and student outcomes: A review of the evidence and benefit-cost analysis* (Doc. No. 13-01-2201). Olympia: Washington State Institute for Public Policy.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|------------------------|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | | |
| | | | | ES | SE | Age | ES | SE | Age | ES | p-value |
| High school graduation | 8 | 77 | 1000 | 0.004 | 0.004 | 8 | 0.004 | 0.004 | 18 | 0.004 | 0.317 |
| Test scores | 8 | 77 | 1000 | 0.007 | 0.009 | 8 | 0.004 | 0.005 | 17 | 0.007 | 0.452 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

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Class size: reducing average class size by one student in one grade, 4-6 Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated January 2013.

Program Description: Washington State's prototypical school funding formula allocates funding for an average class size of 27 students in grades 4-6 (RCW 28A.150.260). We estimate the benefits and costs of reducing 4th-6th grade average class sizes by one student.

Benefit-Cost Summary Statistics Per Participant

Benefits to:

| | | | |
|----------------------|-------------|---------------------------------|--------|
| Taxpayers | \$137 | Benefit to cost ratio | \$1.99 |
| Participants | \$244 | Benefits minus costs | \$191 |
| Others | \$88 | Chance the program will produce | |
| Indirect | (\$85) | benefits greater than the costs | 55 % |
| <hr/> Total benefits | <hr/> \$384 | | |
| Net program cost | (\$193) | | |
| Benefits minus cost | \$191 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to:¹

Benefits to:

| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
|--|--------------|-------------|---------------------|-----------------------|-------------|
| Crime | \$0 | \$1 | \$2 | \$0 | \$3 |
| Labor market earnings associated with test scores | \$250 | \$113 | \$111 | \$0 | \$475 |
| Health care associated with educational attainment | (\$6) | \$23 | (\$25) | \$11 | \$3 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$96) | (\$96) |
| <hr/> Totals | <hr/> \$244 | <hr/> \$137 | <hr/> \$88 | <hr/> (\$85) | <hr/> \$384 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

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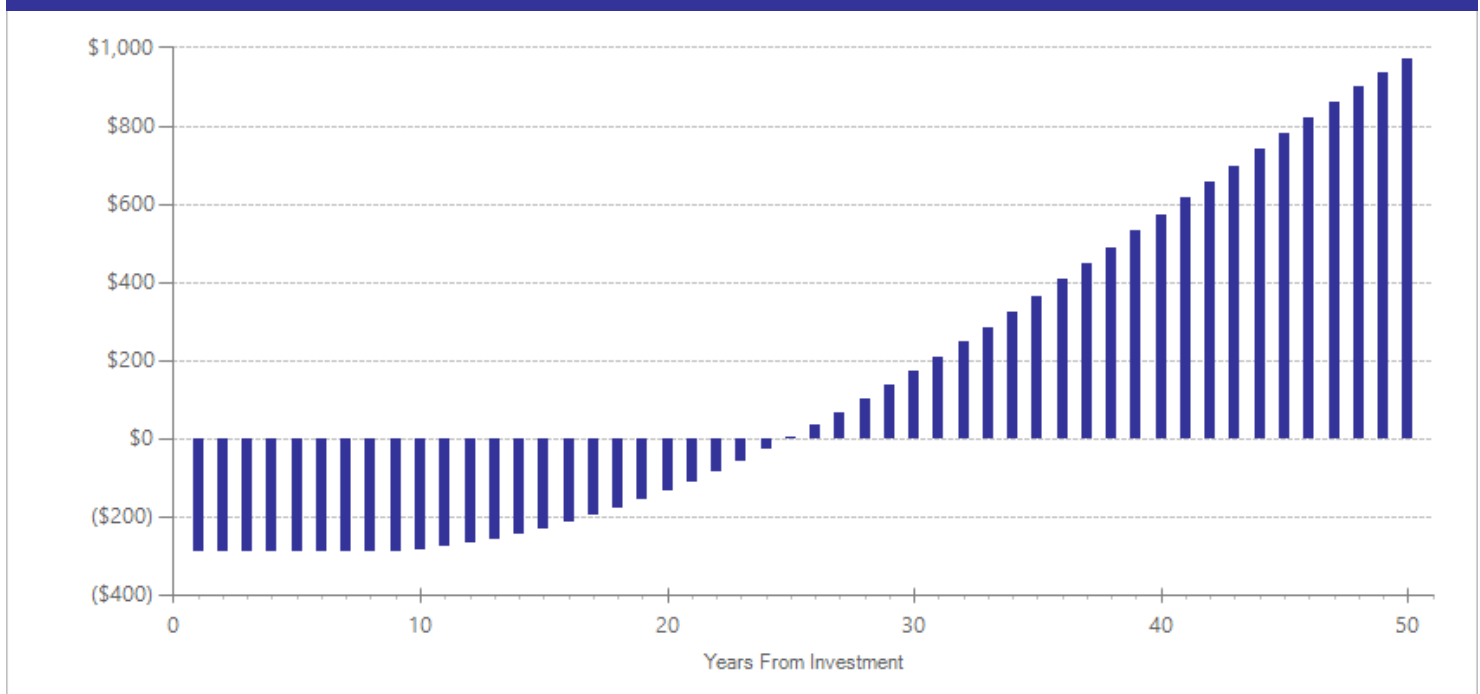
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|---------|
| Program costs | \$179 | 2011 | Present value of net program costs (in 2017 dollars) | (\$193) |
| Comparison costs | \$0 | 2011 | Cost range (+ or -) | 0 % |

The cost estimate accounts for state and school district teacher compensation, marginal operating, and capital costs. Annual teacher costs were calculated using the 2011-12 average total (state and local) salary for Washington certificated teachers reported in the Office of Superintendent of Public Instruction School District Personnel Summary Profiles. The calculation includes salaries and benefits as well as central administration and special education costs. Assumptions for capital cost calculations were provided by legislative staff, with one exception: the interest rate on bonds is from the Federal Reserve's November 2012 state and local rate. Aos, S., & Pennucci, A. (2013). *K-12 class size reductions and student outcomes: A review of the evidence and benefit-cost analysis* (Doc. No. 13-01-2201). Olympia: Washington State Institute for Public Policy.

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The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|------------------------|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| High school graduation | 10 | 77 | 1000 | 0.003 | 0.003 | 10 | 0.003 | 0.003 | 18 | 0.003 | 0.431 |
| Test scores | 10 | 77 | 1000 | 0.004 | 0.008 | 10 | 0.003 | 0.006 | 17 | 0.004 | 0.621 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

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WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

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Class size: reducing average class size by one student in one grade, 9-12 Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated January 2013.

Program Description: Washington State's prototypical school funding formula allocates funding for an average class size of 28.74 students in grades 9 through 12 (RCW 28A.150.260). We estimate the benefits and costs of reducing high school average class sizes by one student.

Benefit-Cost Summary Statistics Per Participant

Benefits to:

| | | | |
|-------------------------|----------------|---------------------------------|--------|
| Taxpayers | \$117 | Benefit to cost ratio | \$1.95 |
| Participants | \$216 | Benefits minus costs | \$164 |
| Others | \$81 | Chance the program will produce | |
| Indirect | (\$78) | benefits greater than the costs | 53 % |
| <u>Total benefits</u> | <u>\$337</u> | | |
| <u>Net program cost</u> | <u>(\$173)</u> | | |
| Benefits minus cost | \$164 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to:¹

Benefits to:

| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
|--|--------------|--------------|---------------------|-----------------------|--------------|
| Crime | \$0 | \$1 | \$1 | \$0 | \$2 |
| Labor market earnings associated with test scores | \$221 | \$100 | \$98 | \$0 | \$419 |
| Health care associated with educational attainment | (\$5) | \$17 | (\$18) | \$8 | \$2 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$86) | (\$86) |
| Totals | \$216 | \$117 | \$81 | (\$78) | \$337 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

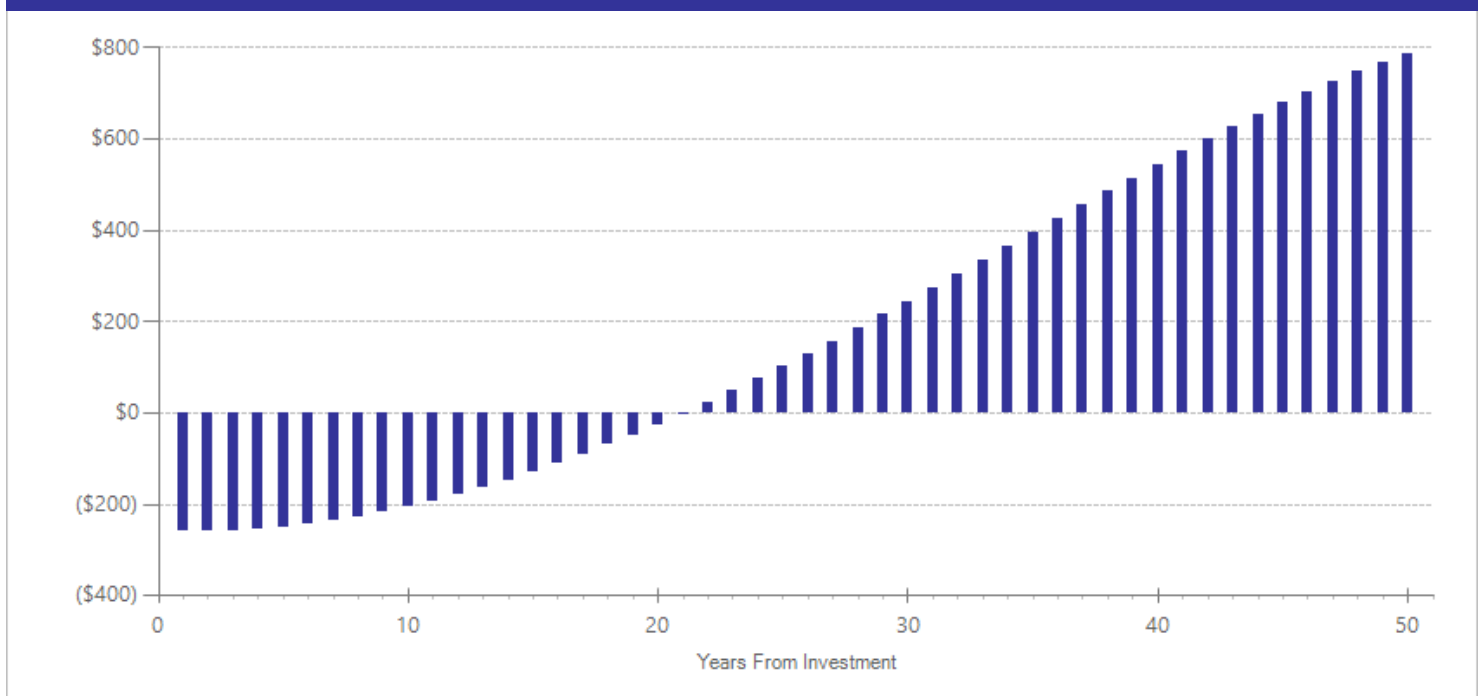
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|---------|
| Program costs | \$160 | 2011 | Present value of net program costs (in 2017 dollars) | (\$173) |
| Comparison costs | \$0 | 2011 | Cost range (+ or -) | 0 % |

The cost estimate accounts for state and school district teacher compensation, marginal operating, and capital costs. Annual teacher costs are calculated using the 2011-12 average total (state and local) salary for Washington certificated teachers reported in the Office of Superintendent of Public Instruction School District Personnel Summary Profiles. The calculation includes salaries and benefits as well as central administration and special education costs. Assumptions for capital cost calculations were provided by legislative staff, with one exception: the interest rate on bonds is from the Federal Reserve's November 2012 state and local rate. Aos, S., & Pennucci, A. (2013). *K-12 class size reductions and student outcomes: A review of the evidence and benefit-cost analysis* (Doc. No. 13-01-2201). Olympia: Washington State Institute for Public Policy.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|------------------------|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| High school graduation | 16 | 77 | 1000 | 0.002 | 0.003 | 16 | 0.002 | 0.003 | 18 | 0.002 | 0.583 |
| Test scores | 16 | 77 | 1000 | 0.002 | 0.008 | 16 | 0.002 | 0.007 | 17 | 0.002 | 0.781 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

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Class size: reducing average class size by one student in one grade, 7-8 Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated January 2013.

Program Description: Washington State's prototypical school funding formula allocates funding for an average class size of 28.53 students in grades 7 and 8 (RCW 28A.150.260). We estimate the benefits and costs of reducing 7th and 8th grade average class sizes by one student.

Benefit-Cost Summary Statistics Per Participant

Benefits to:

| | | | |
|----------------------------|----------------|---------------------------------|--------|
| Taxpayers | \$116 | Benefit to cost ratio | \$1.85 |
| Participants | \$209 | Benefits minus costs | \$148 |
| Others | \$76 | Chance the program will produce | |
| Indirect | (\$78) | benefits greater than the costs | 53 % |
| Total benefits | \$323 | | |
| Net program cost | (\$175) | | |
| Benefits minus cost | \$148 | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

Benefits from changes to:¹

Benefits to:

| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
|--|--------------|--------------|---------------------|-----------------------|--------------|
| Crime | \$0 | \$1 | \$1 | \$0 | \$2 |
| Labor market earnings associated with test scores | \$214 | \$97 | \$94 | \$0 | \$405 |
| Health care associated with educational attainment | (\$5) | \$18 | (\$20) | \$9 | \$3 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$88) | (\$88) |
| Totals | \$209 | \$116 | \$76 | (\$78) | \$323 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

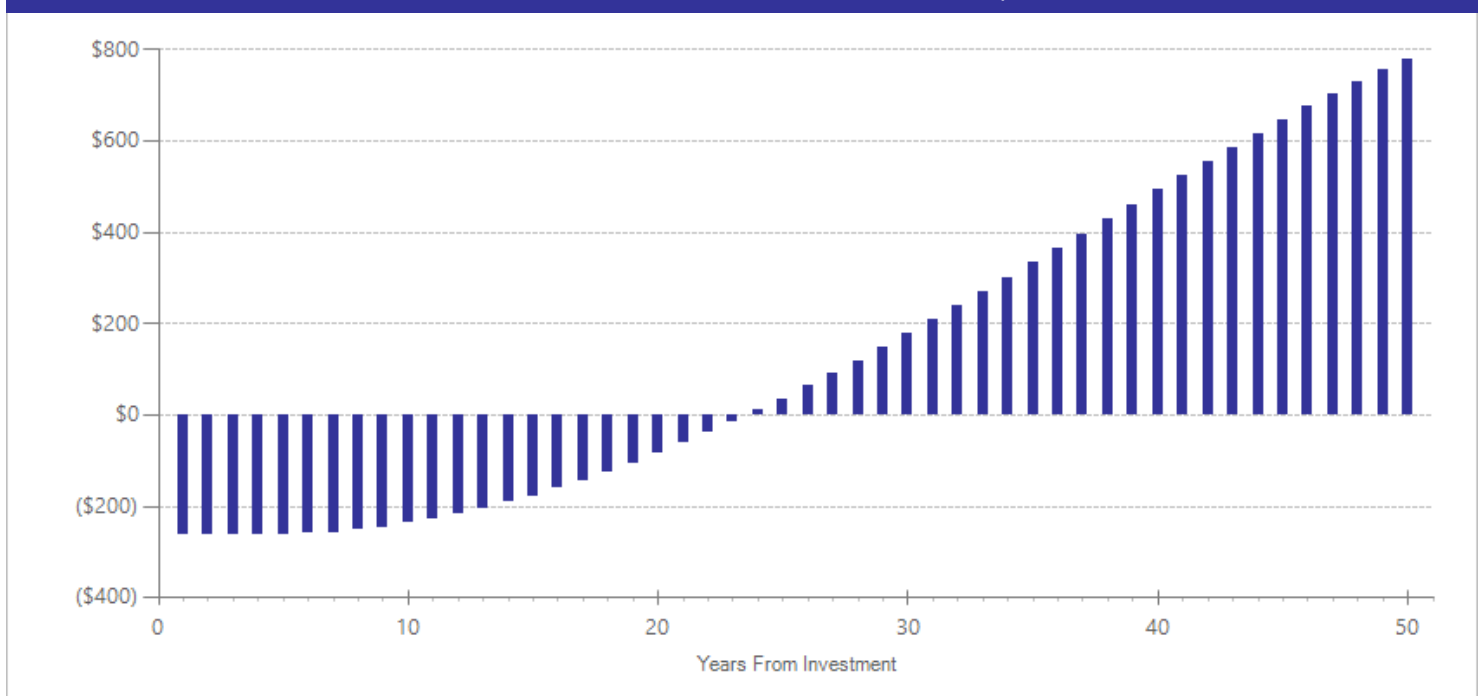
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|---------|
| Program costs | \$162 | 2011 | Present value of net program costs (in 2017 dollars) | (\$175) |
| Comparison costs | \$0 | 2011 | Cost range (+ or -) | 0 % |

The cost estimate accounts for state and school district teacher compensation, marginal operating, and capital costs. Annual teacher costs are calculated using the 2011-12 average total (state and local) salary for Washington certificated teachers reported in the Office of Superintendent of Public Instruction School District Personnel Summary Profiles. The calculation includes salaries and benefits as well as central administration and special education costs. Assumptions for capital cost calculations were provided by legislative staff, with one exception: the interest rate on bonds is from the Federal Reserve's November 2012 state and local rate. Aos, S., & Pennucci, A. (2013). *K-12 class size reductions and student outcomes: A review of the evidence and benefit-cost analysis* (Doc. No. 13-01-2201). Olympia: Washington State Institute for Public Policy.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|------------------------|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| High school graduation | 13 | 77 | 1000 | 0.002 | 0.003 | 13 | 0.002 | 0.003 | 18 | 0.002 | 0.532 |
| Test scores | 13 | 77 | 1000 | 0.003 | 0.008 | 13 | 0.002 | 0.006 | 17 | 0.003 | 0.723 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

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- Leigh, A.K. (2010). Estimating teacher effectiveness from two-year changes in students' test scores. *Economics of Education Review*, 29(3), 480-488.
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Teacher professional development: Not targeted

Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated June 2014.

Program Description: Generally, professional development (PD) for K–12 teachers includes activities such as workshops, conferences, summer institutes, and time set aside during the school year for staff development. The evaluations included in this analysis examine impacts on student outcomes from providing more time and funding for teacher PD without directing how those resources are used.

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|----------------------------|----------------|---------------------------------|----------|
| Taxpayers | \$7 | Benefit to cost ratio | (\$0.19) |
| Participants | \$14 | Benefits minus costs | (\$108) |
| Others | \$6 | Chance the program will produce | |
| Indirect | (\$45) | benefits greater than the costs | 38 % |
| Total benefits | (\$18) | | |
| Net program cost | (\$90) | | |
| Benefits minus cost | (\$108) | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|--|--------------|------------|---------------------|-----------------------|---------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Labor market earnings associated with test scores | \$15 | \$7 | \$6 | \$0 | \$27 |
| Health care associated with educational attainment | \$0 | \$0 | \$0 | \$0 | \$0 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$45) | (\$45) |
| Totals | \$14 | \$7 | \$6 | (\$45) | (\$18) |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²“Others” includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³“Indirect benefits” includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

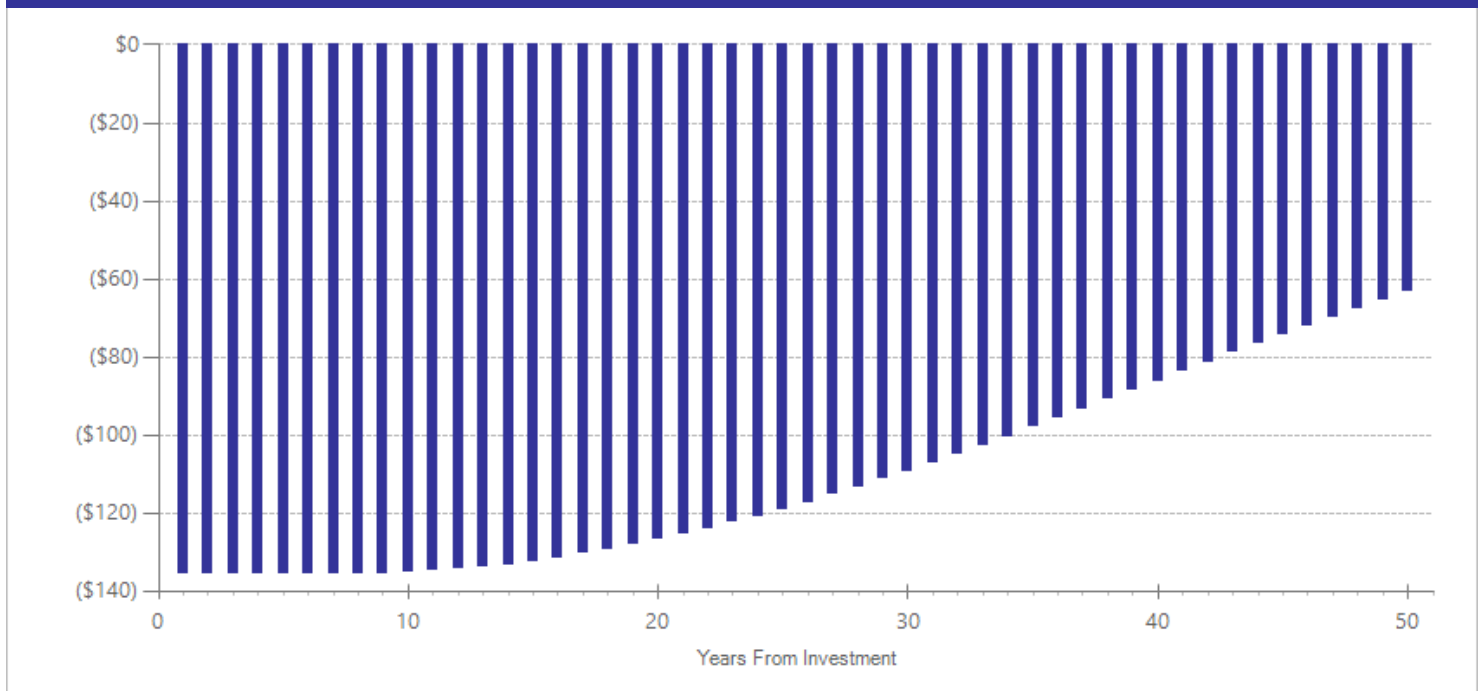
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|--------|
| Program costs | \$86 | 2013 | Present value of net program costs (in 2017 dollars) | (\$90) |
| Comparison costs | \$0 | 2013 | Cost range (+ or -) | 10 % |

In the evaluations included in the meta-analysis, teachers received an average of 20 additional hours of non-targeted professional development (PD) in comparison with the usual amount of PD time. We calculated the value of PD time using average teacher salaries (including benefits) in Washington State as reported by the Office of Superintendent of Public Instruction. To calculate a per-student annual cost, we divided compensation costs by the number of students per classroom in Washington's prototypical schools formula and add per-student materials, supplies, and operating costs to account for the overhead (i.e. facility and administrative costs) associated with providing PD.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|-------------------|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| Test scores | 10 | 12 | 461497 | 0.000 | 0.002 | 11 | 0.000 | 0.002 | 17 | 0.000 | 0.996 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

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Full-day kindergarten

Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated December 2013.

Program Description: In this analysis, we compare the effects of full day kindergarten programs with the effects of half day kindergarten among public school students.

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|----------------------------|------------------|---------------------------------|-----------|
| Taxpayers | \$481 | Benefit to cost ratio | \$0.18 |
| Participants | \$996 | Benefits minus costs | (\$2,303) |
| Others | \$418 | Chance the program will produce | |
| Indirect | (\$1,390) | benefits greater than the costs | 39 % |
| Total benefits | \$505 | | |
| Net program cost | (\$2,808) | | |
| Benefits minus cost | (\$2,303) | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|--|--------------|--------------|---------------------|-----------------------|--------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Labor market earnings associated with test scores | \$1,003 | \$455 | \$446 | \$0 | \$1,904 |
| Health care associated with educational attainment | (\$7) | \$26 | (\$28) | \$12 | \$3 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$1,403) | (\$1,403) |
| Totals | \$996 | \$481 | \$418 | (\$1,390) | \$505 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

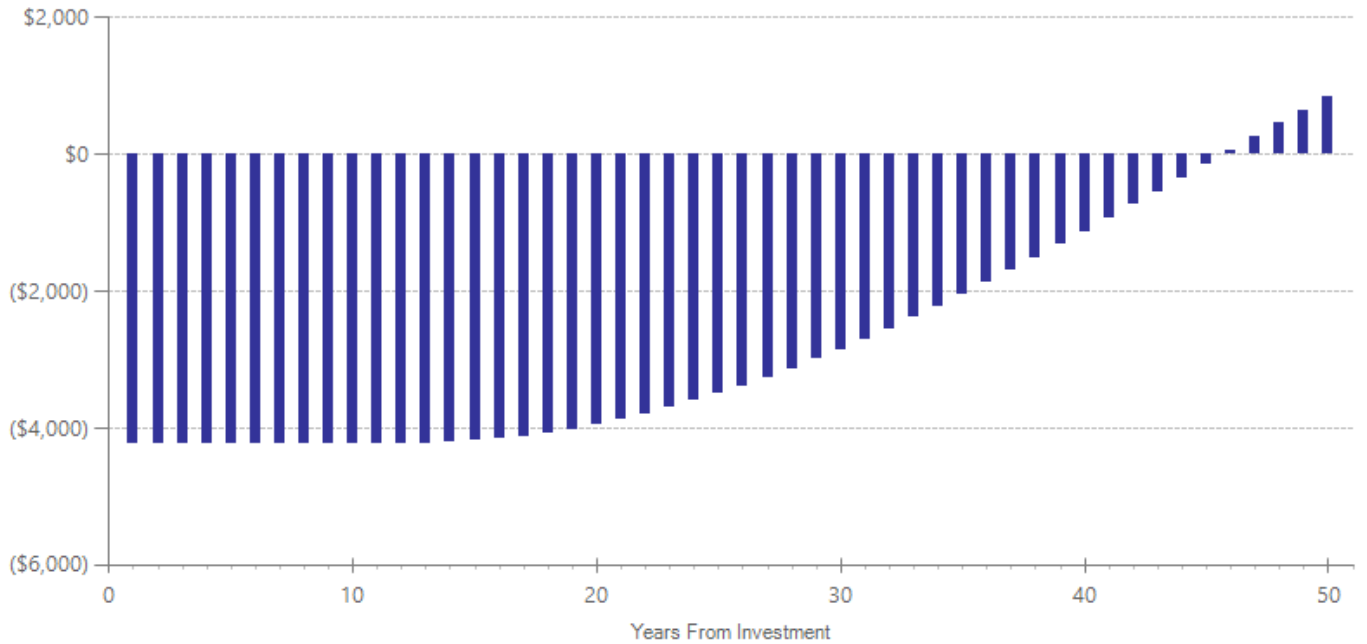
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|-----------|
| Program costs | \$3,151 | 2012 | Present value of net program costs (in 2017 dollars) | (\$2,808) |
| Comparison costs | \$505 | 2012 | Cost range (+ or -) | 10 % |

Treatment costs are the increased cost to provide full-day kindergarten rather than half-day kindergarten including twice the staff costs and additional classroom space. We estimated the construction costs of new classrooms based on a kindergarten class size of twenty, 90 square foot of space per student and \$188.55 (2012 dollars) of construction costs per square foot; We estimated that 50% of the comparison group students who were eligible would use a half day of child care subsidies. We estimated that 48.91% of students would be eligible for child care subsidies based on the number of students eligible for free and reduced-priced meals (Office of Superintendent of Public Instruction. (2012). 2012-2013 Washington Public School Free and Reduced-Price Meal Eligibility. <http://k12.wa.us/ChildNutrition/Reports/FreeReducedMeals.aspx> and Department of Early Learning. (2013). Child Care Subsidy Rates. <http://www.del.wa.gov/publications/subsidy/docs/ChildCareSubsidyRates.pdf>)

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|-------------------|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| Test scores | 5 | 2 | 23127 | 0.022 | 0.091 | 8 | 0.012 | 0.068 | 17 | 0.022 | 0.812 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

Citations Used in the Meta-Analysis

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"Check-in" behavior interventions

Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated May 2015.

Program Description: Check-in behavior interventions provide support for at-risk students in grades K–12 in order to reduce dropouts, promote engagement at school, and reduce problem behaviors. Typically, students must check-in with a designated adult at the school each day. The designated adult collects and monitors data on at-risk indicators (e.g. tardiness, absenteeism, discipline referrals, and poor grades); provides feedback and mentoring; facilitates individualized interventions as appropriate; and ensures communication with parents. The programs included in this analysis are (in no particular order) Check-In, Check-Out (also known as the Behavior Education Program); Check and Connect; and Check, Connect, and Expect.

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|----------------------------|------------------|---------------------------------|-----------|
| Taxpayers | (\$222) | Benefit to cost ratio | (\$1.52) |
| Participants | (\$1,039) | Benefits minus costs | (\$3,448) |
| Others | (\$270) | Chance the program will produce | |
| Indirect | (\$547) | benefits greater than the costs | 47 % |
| Total benefits | (\$2,078) | | |
| Net program cost | (\$1,370) | | |
| Benefits minus cost | (\$3,448) | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|---|------------------|----------------|---------------------|-----------------------|------------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Crime | \$0 | \$21 | \$49 | \$11 | \$80 |
| Labor market earnings associated with test scores | (\$1,087) | (\$494) | (\$493) | \$0 | (\$2,073) |
| K-12 grade repetition | \$0 | \$2 | \$0 | \$1 | \$3 |
| K-12 special education | \$0 | \$79 | \$0 | \$40 | \$119 |
| Health care associated with externalizing behavior symptoms | \$48 | \$169 | \$175 | \$86 | \$477 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$684) | (\$684) |
| Totals | (\$1,039) | (\$222) | (\$270) | (\$547) | (\$2,078) |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

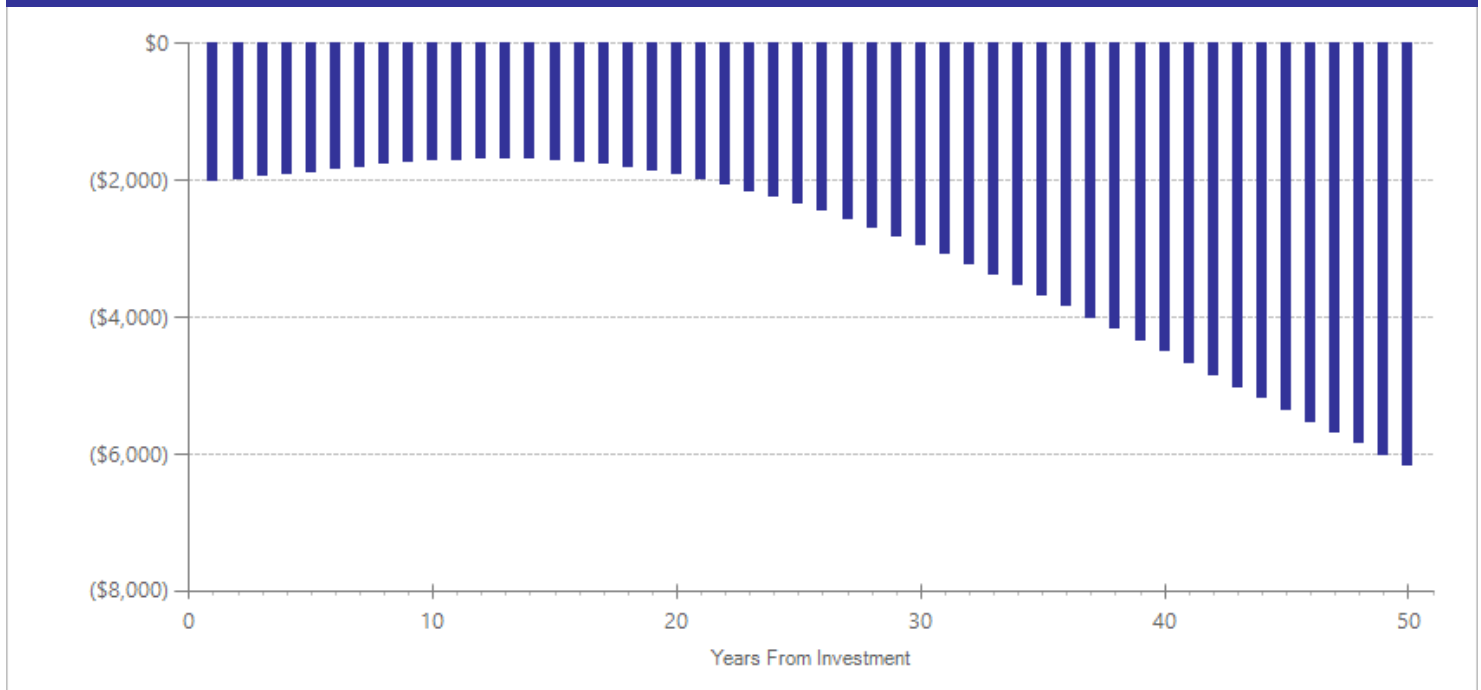
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|-----------|
| Program costs | \$1,329 | 2014 | Present value of net program costs (in 2017 dollars) | (\$1,370) |
| Comparison costs | \$0 | 2014 | Cost range (+ or -) | 30 % |

Costs for check-in programs can vary depending on the type and intensity of the intervention. To calculate a per-student annual cost, we use the average between a minimal check-in program facilitated by a paraprofessional serving a caseload of up to 15 students and a more intensive program facilitated by a school counselor with a caseload of up to 35 students. We use average Washington State compensation costs (including benefits) for K-12 staff as reported by the Office of the Superintendent of Public Instruction and include training time in our estimate. Program implementation details are based in part on information provided by the following sources: National Center on Intensive Intervention. (n.d.) Behavior Education Program (BEP) or Check-in/Check-out (CICO). Retrieved from <http://www.intensiveintervention.org/chart/behavioral-intervention-chart> and Coalition for Evidence-Based Policy. (2015). Check and Connect. Retrieved from <http://evidencebasedprograms.org/1366-2/check-and-connect>.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|--|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| Externalizing behavior symptoms | 8 | 1 | 121 | -0.094 | 0.209 | 9 | -0.052 | 0.127 | 12 | -0.218 | 0.298 |
| Grade point average [^] | 8 | 1 | 89 | 0.070 | 0.146 | 15 | n/a | n/a | n/a | 0.070 | 0.633 |
| Internalizing symptoms | 8 | 1 | 121 | -0.140 | 0.209 | 9 | -0.140 | 0.209 | 11 | -0.325 | 0.122 |
| Office discipline referrals [^] | 8 | 2 | 116 | -0.276 | 0.143 | 15 | n/a | n/a | n/a | -0.276 | 0.054 |
| School attendance [^] | 8 | 1 | 89 | 0.010 | 0.146 | 15 | n/a | n/a | n/a | 0.010 | 0.945 |
| Test scores | 8 | 1 | 121 | -0.016 | 0.209 | 9 | -0.010 | 0.230 | 17 | -0.037 | 0.858 |

[^]WSIPP's benefit-cost model does not monetize this outcome.

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

Citations Used in the Meta-Analysis

- Cheney, D.A., Stage, S.A., Hawken, L.S., Lynass, L., Mielenz, C., & Waugh, M. (2009). A 2-year outcome study of the Check, Connect, and Expect intervention for students at risk for severe behavior problems. *Journal of Emotional and Behavioral Disorders, 17*(4), 226-243.
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- Simonsen, B., Myers, D., & Briere, D. (2010). Comparing a behavioral Check-In/Check-Out (CICO) intervention to standard practice in an urban middle school setting using an experimental group design. *Journal of Positive Behavior Interventions, 13*(1), 31-48.

Educator professional development: Use of data to guide instruction

Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated June 2014.

Program Description: One form of professional development (PD) involves training senior/mentoring/coaching teachers how to use student academic assessment data to modify and improve instruction. In this "train the trainers" approach, teacher-leaders directly receive the training and then share what they have learned with classroom teachers. This type of PD is usually paired with computer software that tracks and reports student assessment data to teachers. The specific types of assessments and software evaluated and included in this meta-analysis are (in no particular order) Individualized Student Instruction (ISI) using A2i software and Ohio's Personalized Assessment Reporting System (PARS).

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|-------------------------|------------------|---------------------------------|------------|
| Taxpayers | (\$887) | Benefit to cost ratio | (\$188.61) |
| Participants | (\$1,832) | Benefits minus costs | (\$3,533) |
| Others | (\$762) | Chance the program will produce | |
| Indirect | (\$34) | benefits greater than the costs | 30 % |
| <u>Total benefits</u> | <u>(\$3,514)</u> | | |
| <u>Net program cost</u> | <u>(\$19)</u> | | |
| Benefits minus cost | (\$3,533) | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|--|------------------|----------------|---------------------|-----------------------|------------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Labor market earnings associated with test scores | (\$1,845) | (\$838) | (\$816) | \$0 | (\$3,498) |
| Health care associated with educational attainment | \$13 | (\$49) | \$54 | (\$24) | (\$7) |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$9) | (\$9) |
| Totals | (\$1,832) | (\$887) | (\$762) | (\$34) | (\$3,514) |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

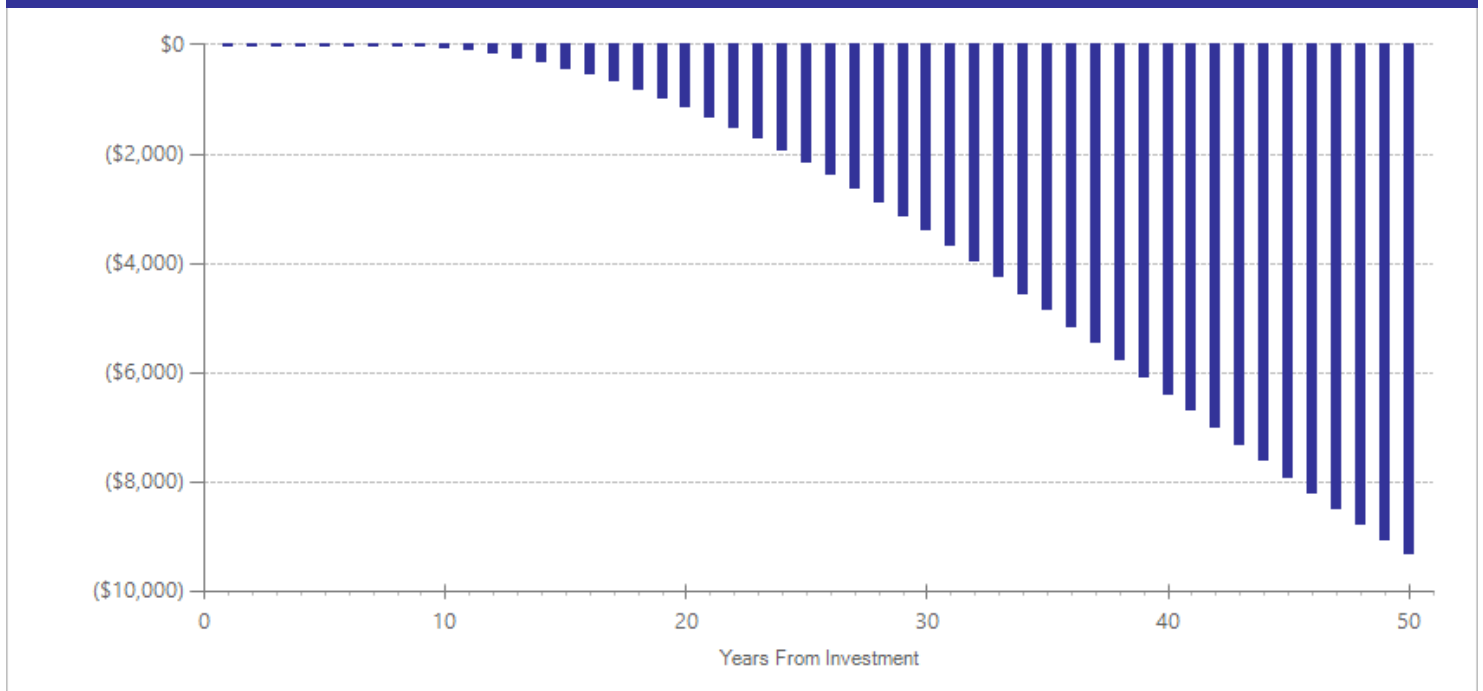
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|--------|
| Program costs | \$18 | 2013 | Present value of net program costs (in 2017 dollars) | (\$19) |
| Comparison costs | \$0 | 2013 | Cost range (+ or -) | 10 % |

In the evaluations included in this meta-analysis, educators received an average of three hours of training in how to use student assessment data to guide instruction. We calculated the value of PD time using average teacher salaries (including benefits) as reported by the Office of Superintendent of Public Instruction. To calculate a per-student annual cost, we divided compensation costs by the number of students per classroom in Washington's prototypical schools formula and added per-student materials, supplies, and operating costs to account for the overhead (i.e. facility, computer, and administrative costs) associated with providing PD.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|-------------------|---------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | ES | SE | Age | ES | SE | Age | | |
| Test scores | 10 | 2 | 26047 | -0.030 | 0.036 | 10 | -0.020 | 0.040 | 17 | -0.030 | 0.409 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

Citations Used in the Meta-Analysis

- Carlson, D., Borman, G.D., & Robinson, M. (2011). A multistate district-level cluster randomized trial of the impact of data-driven reform on reading and mathematics achievement. *Educational Evaluation and Policy Analysis, 33*(3), 378-398.
- May, H., & Robinson, M.A. (2007). *A randomized evaluation of Ohio's personalized assessment report system (PARS)*. Madison, WI: Consortium for Policy Research in Education.

Even Start Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated April 2012.

Program Description: Even Start is a federally-funded program that provides early childhood education, adult education (including basic education and/or instruction for English language learners), parenting education, and parent-child literacy activities to low-income families with young children.

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|-------------------------|------------------|---------------------------------|-----------|
| Taxpayers | (\$793) | Benefit to cost ratio | (\$1.19) |
| Participants | (\$1,590) | Benefits minus costs | (\$9,637) |
| Others | (\$621) | Chance the program will produce | |
| Indirect | (\$2,228) | benefits greater than the costs | 31 % |
| <u>Total benefits</u> | <u>(\$5,233)</u> | | |
| <u>Net program cost</u> | <u>(\$4,404)</u> | | |
| Benefits minus cost | (\$9,637) | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|--|------------------|----------------|---------------------|-----------------------|------------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Labor market earnings associated with test scores | (\$1,608) | (\$730) | (\$690) | \$0 | (\$3,028) |
| Health care associated with educational attainment | \$17 | (\$63) | \$69 | (\$33) | (\$10) |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$2,195) | (\$2,195) |
| Totals | (\$1,590) | (\$793) | (\$621) | (\$2,228) | (\$5,233) |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

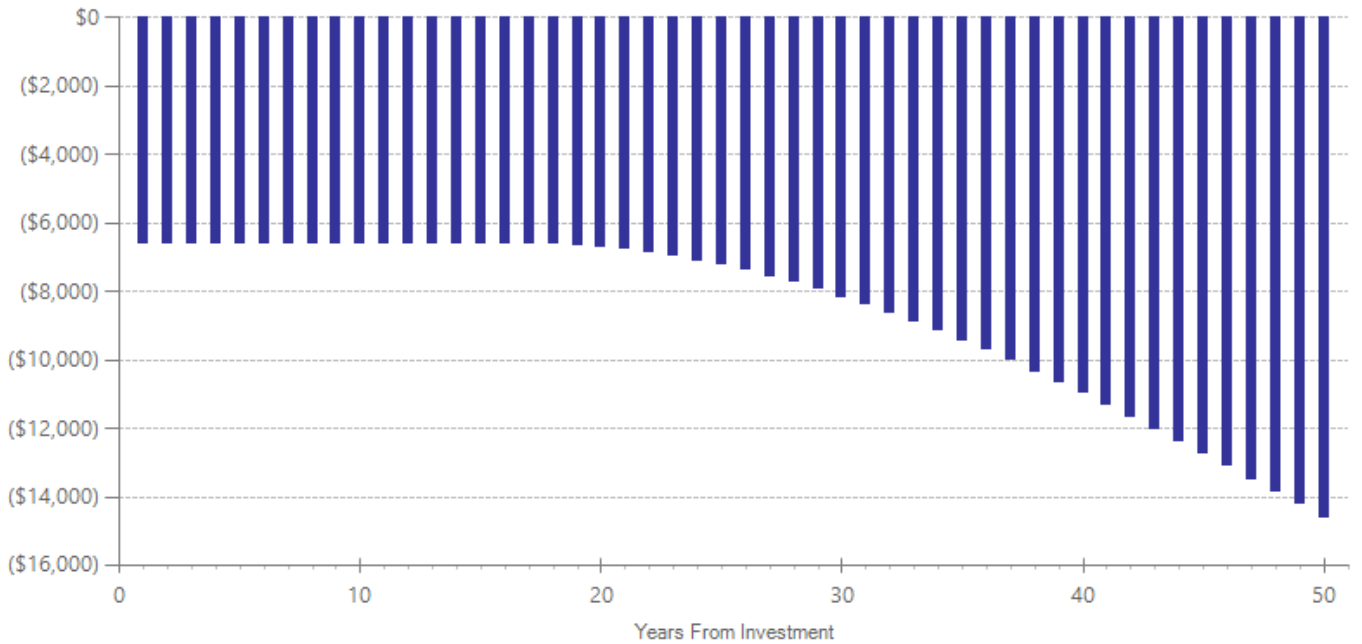
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|-----------|
| Program costs | \$4,708 | 2001 | Present value of net program costs (in 2017 dollars) | (\$4,404) |
| Comparison costs | \$1,679 | 2010 | Cost range (+ or -) | 10 % |

Families typically participate in Even Start for a year or less. Per-family costs from St. Pierre, R.G., Ricciuti, A., Tao, F., Creps, C., Swartz, J., Lee, W., Parsad, A., & Rimdzius, T. (2003). *Third National Even Start Evaluation: Program impacts and implications for improvement*. Cambridge, MA: Abt Associates, Inc.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | Primary or secondary participant | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|-----------------------------|---------------|----------------------------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | | First time ES is estimated | | | Second time ES is estimated | | | | |
| | | | | | ES | SE | Age | ES | SE | Age | ES | p-value |
| Test scores | 1 | Primary | 2 | 183 | -0.051 | 0.142 | 6 | -0.021 | 0.156 | 17 | -0.051 | 0.718 |
| Adult literacy [^] | 29 | Secondary | 2 | 234 | 0.006 | 0.124 | 31 | n/a | n/a | n/a | 0.006 | 0.961 |
| Employment ^{^^} | 29 | Secondary | 2 | 234 | 0.004 | 0.216 | 31 | n/a | n/a | n/a | 0.004 | 0.984 |
| GED attainment [^] | 29 | Secondary | 2 | 249 | 0.074 | 0.234 | 31 | n/a | n/a | n/a | 0.074 | 0.753 |

[^]WSIPP’s benefit-cost model does not monetize this outcome.

^{^^}WSIPP does not include this outcome when conducting benefit-cost analysis for this program.

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

Citations Used in the Meta-Analysis

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Early Head Start Pre-K to 12 Education

Benefit-cost estimates updated December 2018. Literature review updated April 2012.

Program Description: Early Head Start is a federally-funded program for low-income pregnant women and families with infants or toddlers that aims to enhance children's development and health and strengthen families. Families can receive services until the children are three years old. Early Head Start accounts for 10% of the Head Start budget; program providers determine the specific services offered following Head Start guidelines.

Benefit-Cost Summary Statistics Per Participant

| Benefits to: | | | |
|-------------------------|-------------------|---------------------------------|------------|
| Taxpayers | \$3,607 | Benefit to cost ratio | \$0.05 |
| Participants | \$681 | Benefits minus costs | (\$10,701) |
| Others | \$412 | Chance the program will produce | |
| Indirect | (\$4,077) | benefits greater than the costs | 30 % |
| <u>Total benefits</u> | <u>\$622</u> | | |
| <u>Net program cost</u> | <u>(\$11,324)</u> | | |
| Benefits minus cost | (\$10,701) | | |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2017). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

Detailed Monetary Benefit Estimates Per Participant

| Benefits from changes to: ¹ | Benefits to: | | | | |
|---|--------------|----------------|---------------------|-----------------------|----------------|
| | Participants | Taxpayers | Others ² | Indirect ³ | Total |
| Crime | \$0 | \$3 | \$4 | \$1 | \$9 |
| Labor market earnings associated with test scores | \$569 | \$258 | \$258 | \$0 | \$1,085 |
| K-12 grade repetition | \$0 | \$57 | \$0 | \$28 | \$85 |
| K-12 special education | \$0 | \$1,947 | \$0 | \$968 | \$2,916 |
| Health care associated with externalizing behavior symptoms | \$20 | \$70 | \$72 | \$35 | \$197 |
| Subtotals | \$589 | \$2,336 | \$334 | \$1,033 | \$4,291 |
| From secondary participant | | | | | |
| Labor market earnings associated with major depression | \$485 | \$220 | \$0 | \$0 | \$705 |
| Health care associated with major depression | \$21 | \$76 | \$78 | \$37 | \$212 |
| Public assistance | (\$415) | \$976 | \$0 | \$485 | \$1,046 |
| Mortality associated with depression | \$1 | \$0 | \$0 | \$6 | \$7 |
| Subtotals | \$92 | \$1,272 | \$78 | \$528 | \$1,970 |
| Adjustment for deadweight cost of program | \$0 | \$0 | \$0 | (\$5,638) | (\$5,638) |
| Totals | \$681 | \$3,607 | \$412 | (\$4,077) | \$622 |

¹In addition to the outcomes measured in the meta-analysis table, WSIPP measures benefits and costs estimated from other outcomes associated with those reported in the evaluation literature. For example, empirical research demonstrates that high school graduation leads to reduced crime. These associated measures provide a more complete picture of the detailed costs and benefits of the program.

²"Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance.

³"Indirect benefits" includes estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

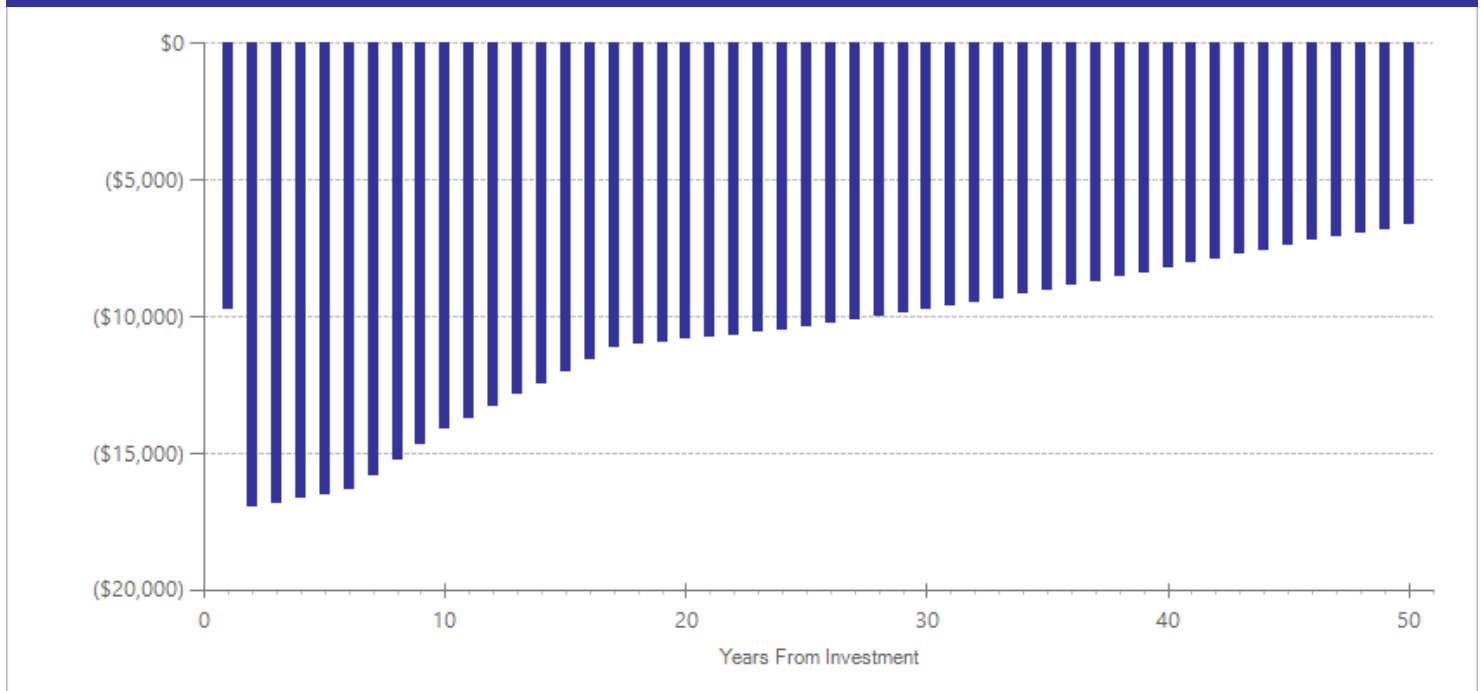
Detailed Annual Cost Estimates Per Participant

| | Annual cost | Year dollars | Summary | |
|------------------|-------------|--------------|--|------------|
| Program costs | \$7,600 | 2010 | Present value of net program costs (in 2017 dollars) | (\$11,324) |
| Comparison costs | \$1,679 | 2010 | Cost range (+ or -) | 10 % |

Families who participate in Early Head Start typically participate for 1.75 years. Per-family costs from the US Department of Health and Human Services, Administration for Children & Families, FY 2010.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty in the cost estimate; more detail can be found in our [Technical Documentation](#).

Detailed Annual Cost Estimates Per Participant



The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in non-discounted dollars to simplify the “break-even” point from a budgeting perspective. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost of the program up to that point in time. The program breaks even when the dollars reach \$0. At this point, the total benefits to participants, taxpayers, and others, are equal to the cost of the program. If the dollars are above \$0, the benefits of the program exceed the initial investment.

Meta-Analysis of Program Effects

| Outcomes measured | Treatment age | Primary or secondary participant | No. of effect sizes | Treatment N | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | | Unadjusted effect size (random effects model) | |
|-------------------------------------|---------------|----------------------------------|---------------------|-------------|---|-------|-----|-----------------------------|-------|-----|---|---------|
| | | | | | First time ES is estimated | | | Second time ES is estimated | | | ES | p-value |
| | | | | | ES | SE | Age | ES | SE | Age | | |
| Crime | 1 | Primary | 1 | 842 | 0.000 | 0.050 | 10 | 0.000 | 0.050 | 20 | 0.000 | 1.000 |
| Externalizing behavior symptoms | 1 | Primary | 1 | 842 | -0.038 | 0.050 | 10 | -0.021 | 0.031 | 13 | -0.038 | 0.447 |
| Internalizing symptoms | 1 | Primary | 1 | 842 | -0.052 | 0.050 | 10 | -0.052 | 0.050 | 12 | -0.052 | 0.296 |
| K-12 grade repetition | 1 | Primary | 1 | 842 | -0.041 | 0.088 | 10 | -0.041 | 0.088 | 17 | -0.041 | 0.637 |
| K-12 special education | 1 | Primary | 1 | 842 | -0.093 | 0.081 | 10 | -0.093 | 0.081 | 17 | -0.093 | 0.252 |
| Test scores | 1 | Primary | 1 | 842 | 0.011 | 0.052 | 10 | 0.007 | 0.057 | 17 | 0.011 | 0.827 |
| Employment ^{^^} | 20 | Secondary | 1 | 842 | 0.000 | 0.050 | 29 | n/a | n/a | n/a | 0.000 | 1.000 |
| Major depressive disorder | 20 | Secondary | 1 | 842 | -0.045 | 0.050 | 29 | -0.023 | 0.274 | 31 | -0.045 | 0.364 |
| Public assistance | 20 | Secondary | 1 | 842 | -0.073 | 0.060 | 29 | -0.073 | 0.060 | 39 | -0.073 | 0.224 |
| Substance use disorder [^] | 20 | Secondary | 1 | 842 | -0.008 | 0.112 | 29 | n/a | n/a | n/a | -0.008 | 0.940 |
| Years of education | 20 | Secondary | 1 | 842 | 0.000 | 0.050 | 29 | 0.000 | 0.050 | 39 | 0.000 | 1.000 |

[^]WSIPP's benefit-cost model does not monetize this outcome.

^{^^}WSIPP does not include this outcome when conducting benefit-cost analysis for this program.

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

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National Board for Professional Teaching Standards (NBPTS) certified teachers (for secondary school students)

Pre-K to 12 Education

Literature review updated March 2018.

Program Description: The National Board for Professional Teaching Standards (NBPTS) certification is an advanced teaching credential that complements (and does not replace) state certification. This analysis estimates the effects middle and high school students experience from having been taught by a NBPTS-certified teacher in a math or English Language Arts course.

Teachers earn NBPTS certification upon completion of a one- to five-year assessment process. The assessment process requires applicants to complete one general skills exam and three portfolios demonstrating their teaching ability and content knowledge. Washington State provides an annual salary bonus to NBPTS-certified teachers. Some NBPTS-certified teachers working in qualifying high-poverty schools can also receive an additional annual bonus.

Meta-Analysis of Program Effects

| Outcomes measured | No. of effect sizes | Treatment N | Adjusted effect size and standard error | | | Unadjusted effect size (random effects model) | |
|-------------------|---------------------|-------------|---|-------|-----|---|---------|
| | | | ES | SE | Age | ES | p-value |
| Test scores | 10 | 284612 | 0.031 | 0.006 | 13 | 0.031 | 0.001 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

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National Board for Professional Teaching Standards (NBPTS) certified teachers (for elementary school students)

Pre-K to 12 Education

Literature review updated March 2018.

Program Description: The National Board for Professional Teaching Standards (NBPTS) certification is an advanced teaching credential that complements (and does not replace) state certification. This analysis estimates the effects elementary school students experience from having been taught by a NBPTS-certified teacher.

Teachers earn NBPTS certification upon completion of a one- to five-year assessment process. The assessment process requires applicants to complete one general skills exam and three portfolios demonstrating their teaching ability and content knowledge. Washington State provides an annual salary bonus to NBPTS-certified teachers. Some NBPTS-certified teachers working in qualifying high-poverty schools can also receive an additional annual bonus.

Meta-Analysis of Program Effects

| Outcomes measured | No. of effect sizes | Treatment N | Adjusted effect size and standard error | | | Unadjusted effect size (random effects model) | |
|------------------------|---------------------|-------------|---|-------|-----|---|---------|
| | | | ES | SE | Age | ES | p-value |
| School attendance | 4 | 20605 | 0.045 | 0.021 | 10 | 0.045 | 0.030 |
| Suspensions/expulsions | 4 | 20605 | 0.001 | 0.001 | 10 | 0.001 | 0.487 |
| Test scores | 17 | 405356 | 0.021 | 0.005 | 10 | 0.021 | 0.001 |

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Citations Used in the Meta-Analysis

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Daily Behavior Report Cards

Pre-K to 12 Education

Literature review updated April 2018.

Program Description: Daily behavior report cards (DBRC) are a systematic method of communicating with parents about a student's behavior in school. Typically, teachers identify students exhibiting behavior problems for participation. The report cards are sent home with the child or electronically, and the student must return the form the following morning with the parent's signature. Behavioral reinforcements or consequences are delivered to students by parents or teachers and are selected based on the individual child. In this analysis, teachers issued electronic report cards to students in 3rd grade over a three-week period, and parents issued behavioral rewards or consequences.

Meta-Analysis of Program Effects

| Outcomes measured | No. of effect sizes | Treatment N | Adjusted effect size and standard error | | | Unadjusted effect size (random effects model) | |
|---|---------------------|-------------|---|-------|-----|---|---------|
| | | | ES | SE | Age | ES | p-value |
| Attention-deficit/hyperactivity disorder symptoms | 1 | 31 | -0.065 | 0.340 | 8 | -0.284 | 0.405 |
| Externalizing behavior symptoms | 1 | 31 | -0.158 | 0.340 | 8 | -0.685 | 0.049 |
| Internalizing symptoms | 1 | 31 | -1.070 | 0.359 | 8 | -1.070 | 0.003 |

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Citations Used in the Meta-Analysis

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Charter schools: overall impact

Pre-K to 12 Education

Literature review updated August 2013.

Program Description: A charter school is a public school governed under a “charter,” or contract, between the group operating the school and an authorizing agency, typically a state or local jurisdiction. Charter schools are often exempt from some state or local rules and regulations but must meet accountability standards articulated in its charter. The studies included in this analysis measure the impact of attending a charter school compared to a traditional public school. We present the findings for reading scores here.

Meta-Analysis of Program Effects

| Outcomes measured | No. of effect sizes | Treatment N | Adjusted effect size and standard error | | | Unadjusted effect size (random effects model) | |
|-------------------|---------------------|-------------|---|-------|-----|---|---------|
| | | | ES | SE | Age | ES | p-value |
| Test scores | 65 | 1597623 | 0.013 | 0.007 | 12 | 0.013 | 0.057 |

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Citations Used in the Meta-Analysis

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Academic vocabulary instruction

Pre-K to 12 Education

Literature review updated March 2018.

Program Description: Academic Vocabulary Instruction is a structured approach to teaching specialized vocabulary words that appear frequently in expository, informational, and academic texts across disciplines (especially in secondary grades) but that are not commonly used in spoken English, such as hypothesis, generate, and domain. The program included in this analysis (Academic Language Instruction for All Students, or ALIAS) was designed for use in classrooms with low performance in English Language Arts and high numbers of English Language Learners. The program provided daily lessons to middle school students over 20 weeks, covered 70 vocabulary words, and provided teachers with materials and monthly implementation support meetings.

Meta-Analysis of Program Effects

| Outcomes measured | No. of effect sizes | Treatment N | Adjusted effect size and standard error | | | Unadjusted effect size (random effects model) | |
|-------------------|---------------------|-------------|---|-------|-----|---|---------|
| | | | ES | SE | Age | ES | p-value |
| Test scores | 1 | 971 | 0.019 | 0.044 | 11 | 0.043 | 0.326 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

Citations Used in the Meta-Analysis

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Pre-K and elementary bilingual instruction for English language learners

Pre-K to 12 Education

Literature review updated June 2014.

Program Description: Bilingual instructional programs provide English language learner (ELL) students with classroom instruction partially in their native language and partially in English. The evaluations included in this analysis compare programs that use bilingual instruction to those in which instruction is conducted entirely in English, such as English as a Second Language (ESL) teaching strategies.

Meta-Analysis of Program Effects

| Outcomes measured | No. of effect sizes | Treatment N | Adjusted effect size and standard error | | | Unadjusted effect size (random effects model) | |
|-------------------|---------------------|-------------|---|-------|-----|---|---------|
| | | | ES | SE | Age | ES | p-value |
| Test scores | 21 | 58227 | 0.014 | 0.006 | 9 | 0.014 | 0.016 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

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Charter schools: urban charter schools

Pre-K to 12 Education

Literature review updated August 2013.

Program Description: Charter schools have traditionally been located in cities; many are designed to serve minority students in high-poverty areas. A body of literature suggests that charter schools located in urban areas may be more effective than charters located outside of the urban core. The studies in this analysis measure the impact of attending a charter school compared to a traditional public school in urban areas. The analysis includes findings from specific cities (e.g. New York or Chicago), as well as statewide studies that examine impacts by urbanicity. We present the findings for reading scores here.

Meta-Analysis of Program Effects

| Outcomes measured | No. of effect sizes | Treatment N | Adjusted effect size and standard error | | | Unadjusted effect size (random effects model) | |
|-------------------|---------------------|-------------|---|-------|-----|---|---------|
| | | | ES | SE | Age | ES | p-value |
| Test scores | 38 | 339551 | 0.044 | 0.013 | 12 | 0.044 | 0.001 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

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Principal quality Pre-K to 12 Education

Literature review updated August 2013.

Program Description: Do school principals directly affect student academic outcomes? The studies in this analysis use a "fixed effects" statistical approach to examine variation in principal quality. The studies focus on principals that move from one school to another; impacts on student outcomes can be estimated for different principals in the same school. The effects presented here represent the impact on test scores from a principal who is one standard deviation above average principal effectiveness.

| Meta-Analysis of Program Effects | | | | | | | |
|----------------------------------|---------------------|-------------|---|-------|-----|---|---------|
| Outcomes measured | No. of effect sizes | Treatment N | Adjusted effect size and standard error | | | Unadjusted effect size (random effects model) | |
| | | | ES | SE | Age | ES | p-value |
| Test scores | 6 | 2580828 | 0.107 | 0.020 | 11 | 0.107 | 0.001 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

Citations Used in the Meta-Analysis

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Charter schools: Knowledge Is Power Program (KIPP)

Pre-K to 12 Education

Literature review updated August 2013.

Program Description: The Knowledge Is Power Program (KIPP) is a network of public charter schools operating in 20 states and the District of Columbia. The schools predominantly enroll low-income and minority students. The studies included in this analysis are of KIPP middle schools around the country and measure the impact of attending a KIPP school compared to a traditional public school. The evidence suggests that KIPP charter schools improve test scores in both reading and math. We present the findings for reading scores here.

Meta-Analysis of Program Effects

| Outcomes measured | No. of effect sizes | Treatment N | Adjusted effect size and standard error | | | Unadjusted effect size (random effects model) | |
|-------------------|---------------------|-------------|---|-------|-----|---|---------|
| | | | ES | SE | Age | ES | p-value |
| Test scores | 9 | 16665 | 0.053 | 0.011 | 11 | 0.053 | 0.001 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

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WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

Citations Used in the Meta-Analysis

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Teacher in-subject graduate degrees

Pre-K to 12 Education

Literature review updated April 2012.

Program Description: This analysis examines the impact of having a teacher with a graduate degree in the subject that they teach (e.g., a math teacher with a graduate degree in mathematics), versus having a teacher without a graduate degree, holding all other measured school, teacher, and student characteristics equal.

| Meta-Analysis of Program Effects | | | | | | | |
|----------------------------------|---------------------|-------------|---|-------|-----|---|---------|
| Outcomes measured | No. of effect sizes | Treatment N | Adjusted effect size and standard error | | | Unadjusted effect size (random effects model) | |
| | | | ES | SE | Age | ES | p-value |
| Test scores | 7 | 58621 | 0.028 | 0.011 | 11 | 0.028 | 0.013 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

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Teacher graduate degrees

Pre-K to 12 Education

Literature review updated April 2012.

Program Description: This analysis examines the impact of having a teacher with a graduate degree, versus having a teacher without a graduate degree, holding all other measured school, teacher, and student characteristics equal.

Meta-Analysis of Program Effects

| Outcomes measured | No. of effect sizes | Treatment N | Adjusted effect size and standard error | | | Unadjusted effect size (random effects model) | |
|-------------------|---------------------|-------------|---|-------|-----|---|---------|
| | | | ES | SE | Age | ES | p-value |
| Test scores | 31 | 5242072 | 0.000 | 0.002 | 11 | 0.000 | 0.931 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

Adjusted effect sizes are used to calculate the benefits from our benefit cost model. WSIPP may adjust effect sizes based on methodological characteristics of the study. For example, we may adjust effect sizes when a study has a weak research design or when the program developer is involved in the research. The magnitude of these adjustments varies depending on the topic area.

WSIPP may also adjust the second ES measurement. Research shows the magnitude of some effect sizes decrease over time. For those effect sizes, we estimate outcome-based adjustments which we apply between the first time ES is estimated and the second time ES is estimated. We also report the unadjusted effect size to show the effect sizes before any adjustments have been made. More details about these adjustments can be found in our [Technical Documentation](#).

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Model early childhood education programs

Pre-K to 12 Education

Literature review updated December 2013.

Program Description: This analysis focuses on pre-kindergarten programs developed and administered by researchers primarily in the 1960s and 1970s, including demonstration and pilot programs such as Abecedarian and Perry Preschool. The curriculum and philosophy of these programs varied widely and programs ranged in length from one to five years.

Meta-Analysis of Program Effects

| Outcomes measured | Primary or secondary participant | No. of effect sizes | Treatment N | Adjusted effect size and standard error | | | Unadjusted effect size (random effects model) | |
|---------------------------------|----------------------------------|---------------------|-------------|---|-------|-----|---|---------|
| | | | | ES | SE | Age | ES | p-value |
| Crime | Primary | 2 | 110 | -0.322 | 0.214 | 29 | -0.322 | 0.132 |
| High school graduation | Primary | 3 | 203 | 0.314 | 0.265 | 18 | 0.314 | 0.237 |
| K-12 grade repetition | Primary | 3 | 192 | -0.463 | 0.253 | 17 | -0.463 | 0.067 |
| K-12 special education | Primary | 3 | 204 | -0.470 | 0.263 | 17 | -0.470 | 0.074 |
| Teen births under age 18 | Primary | 2 | 109 | -0.441 | 0.395 | 17 | -0.441 | 0.265 |
| Test scores | Primary | 2 | 309 | 0.568 | 0.123 | 4 | 0.568 | 0.001 |
| Teen births (second generation) | Secondary | 2 | 109 | -0.441 | 0.395 | 17 | -0.441 | 0.265 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

An effect size (ES) is a standard metric that summarizes the degree to which a program or policy affects a measured outcome. If the effect size is positive, the outcome increases. If the effect size is negative, the outcome decreases.

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Transition programs for incoming kindergarteners

Pre-K to 12 Education

Literature review updated March 2018.

Program Description: Transition programs for incoming kindergarteners provide support to at-risk students and their caregivers in order to enhance school readiness, improve academic and social skills, and increase caregiver involvement in school. In the program included in this analysis (Kids in Transition to School [KITS]), students attend 24 structured group sessions over two months in the summer prior to kindergarten entry and two months in the fall after school begins. The sessions focus on early literacy, prosocial skills, and self-regulation. In addition, caregivers attend 12 workshops with a focus on parenting skills, behavior management, and strategies to help their student develop literacy skills and consistent academic routines.

Meta-Analysis of Program Effects

| Outcomes measured | No. of effect sizes | Treatment N | Adjusted effect size and standard error | | | Unadjusted effect size (random effects model) | |
|---------------------------------|---------------------|-------------|---|-------|-----|---|---------|
| | | | ES | SE | Age | ES | p-value |
| Externalizing behavior symptoms | 1 | 102 | -0.094 | 0.282 | 6 | -0.218 | 0.440 |
| Test scores | 1 | 102 | 0.052 | 0.215 | 5 | 0.122 | 0.570 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

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Teacher experience

Pre-K to 12 Education

Literature review updated April 2012.

Program Description: We performed an analysis of how student test scores improved as their teacher's years of experience increased—more experienced teachers are compared with beginning teachers. This estimate represents the average annual gain in the first five years of teaching.

| Meta-Analysis of Program Effects | | | | | | | |
|----------------------------------|---------------------|-------------|---|-------|-----|---|---------|
| Outcomes measured | No. of effect sizes | Treatment N | Adjusted effect size and standard error | | | Unadjusted effect size (random effects model) | |
| | | | ES | SE | Age | ES | p-value |
| Test scores | 53 | 14393842 | 0.058 | 0.005 | 11 | 0.058 | 0.001 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

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Charter schools: non-urban charter schools

Pre-K to 12 Education

Literature review updated August 2013.

Program Description: While charter schools traditionally operate in urban areas, there is a growing body of literature that examines the impact of attending charters located outside of central cities. This analysis include only studies that measure the impact of attending charter schools located outside of urban areas, including suburban and rural schools. The evidence suggests that charter schools located outside of urban areas have no consistent impact on student test scores compared to traditional public schools. We present the findings for reading scores here.

Meta-Analysis of Program Effects

| Outcomes measured | No. of effect sizes | Treatment N | Adjusted effect size and standard error | | | Unadjusted effect size (random effects model) | |
|-------------------|---------------------|-------------|---|-------|-----|---|---------|
| | | | ES | SE | Age | ES | p-value |
| Test scores | 5 | 21015 | 0.011 | 0.028 | 11 | 0.011 | 0.695 |

Meta-analysis is a statistical method to combine the results from separate studies on a program, policy, or topic in order to estimate its effect on an outcome. WSIPP systematically evaluates all credible evaluations we can locate on each topic. The outcomes measured are the types of program impacts that were measured in the research literature (for example, crime or educational attainment). Treatment N represents the total number of individuals or units in the treatment group across the included studies.

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