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Initial Inventory of Evidence- and Research-Based Practices: Washington's K–12 Learning Assistance Program

Benefit-Cost & Meta-Analysis Results

July 2014

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Case management in schools

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

Program Description: Case management involves placing a full-time social worker or counselor in a school to help identify at-risk students' needs and connect students and families with relevant services in and outside of the K–12 system. Three such models have been evaluated and are included in this analysis (in no particular order): Communities in Schools, City Connects, and Comer School Development Program. In practice, each of these models includes other services (such as extended learning time and educator training), but the program evaluations focus on the impact of the case management component.

Benefit-Cost Summary

Program benefits		Summary statistics	
Participants	$5,350	Benefit to cost ratio	$43.78
Taxpayers	$3,049	Benefits minus costs	$10,568
Other	$2,172	Probability of a positive net present value	67 %
Other indirect	$245		
Total	$10,817		
Costs	($248)		
Benefits minus cost	$10,568		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2013). The economic discount rates and other relevant parameters are described in our technical manual.

Detailed Monetary Benefit Estimates

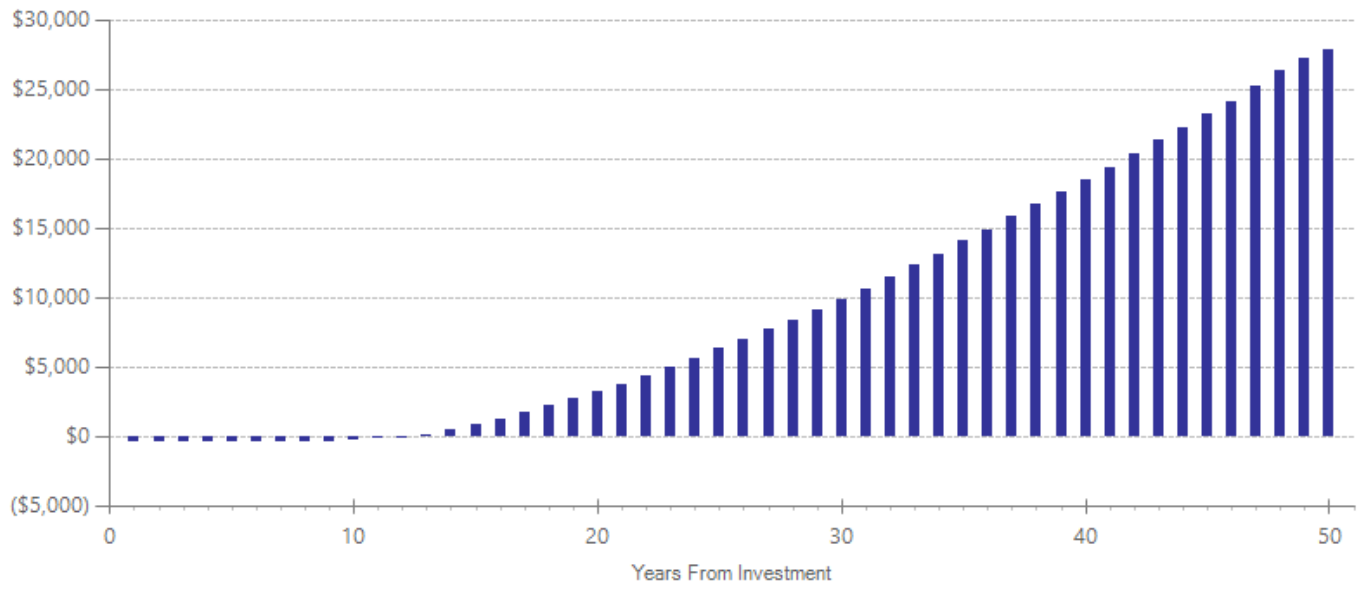
Source of benefits	Benefits to				
	Participants	Taxpayers	Other	Other indirect	Total benefits
From primary participant					
Crime	$0	$8	$22	$4	$34
Labor market earnings (hs grad)	$5,442	$2,321	$2,682	$0	$10,445
Property loss (alcohol abuse/dependence)	$0	$0	$0	$0	$0
Health care (educational attainment)	($92)	$720	($532)	$365	$462
Adjustment for deadweight cost of program	$0	$0	$0	($124)	($124)
Totals	$5,350	$3,049	$2,172	$245	$10,817

Detailed Cost Estimates

	Annual cost	Program duration	Year dollars	Summary statistics	
Program costs	$248	1	2013	Present value of net program costs (in 2013 dollars)	($248)
Comparison costs	$0	1	2013	Uncertainty (+ or - %)	10 %

To calculate a per-student annual cost, we use average compensation costs (including benefits) for a social worker as reported by the Office of the Superintendent of Public Instruction, divided by the number of students in a prototypical elementary school and add per-student annual materials, supplies, and operating costs. The estimate also includes a half-hour of principal and administrative support time per week.

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 uncertainty range is used in Monte Carlo risk analysis, described in our technical manual.



Meta-Analysis of Program Effects

Outcomes measured	Primary or secondary participant	No. of effect sizes	Unadjusted effect size (random effects model)			Adjusted effect sizes and standard errors used in the benefit-cost analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Alcohol use before end of middle school	Primary	3	0.032	0.085	0.705	0.002	0.085	12	0.002	0.085	18
School attendance	Primary	9	-0.002	0.045	0.966	-0.002	0.045	12	0.002	0.054	13
Externalizing behavior symptoms	Primary	1	-0.325	0.161	0.044	-0.016	0.161	12	-0.016	0.161	18
Grade point average	Primary	7	0.078	0.066	0.238	0.033	0.066	12	0.115	0.148	13
High school graduation	Primary	3	0.048	0.089	0.583	0.040	0.089	18	0.040	0.089	18
Internalizing symptoms	Primary	4	-0.030	0.075	0.075	-0.002	0.075	12	-0.002	0.075	18
Cannabis use before end of middle school	Primary	3	0.013	0.085	0.880	0.001	0.085	12	0.001	0.085	18
Office discipline referrals	Primary	2	0.194	0.149	0.192	0.194	0.149	12	0.141	0.162	13
Illicit drug use before end of middle school	Primary	4	-0.034	0.075	0.654	-0.002	0.075	12	-0.002	0.075	18
Test scores	Primary	11	0.023	0.037	0.533	0.009	0.037	12	0.007	0.041	17
Smoking before end of middle school	Primary	3	0.015	0.085	0.862	0.001	0.085	12	0.001	0.085	17

Citations Used in the Meta-Analysis

Cook, T.D., Phillips, M., Settersten, R.A., Shagle, S.C., Degirmencioglu, S. M., & Habib, F.-N. (1999). Comer's school development program in Prince George's County, Maryland: A theory-based evaluation. *American Educational Research Journal, 36*(3), 543-597.

Cook, T.D., Murphy, R. F., & Hunt, H.D. (2000). Comer's School Development Program in Chicago: A theory-based evaluation. *American Educational Research Journal, 37*(2), 535-597.

ICF International. (2008). *Communities in Schools National Evaluation, Volume 1: School-level report*. Retrieved from http://www.communitiesinschools.org/media/uploads/attachments/CIS_School_Level_Report_Volume_1.pdf.

ICF International. (2010). *Communities in Schools National Evaluation Volume 6: Randomized Controlled Trial Study*, Wichita, Kansas. Http://www.communitiesinschools.org/media/uploads/attachments/CIS_RCT_Study_Wichita_Volume_6.pdf

ICF International. (2010). *Communities in Schools National Evaluation Volume 4: Randomized Controlled Trial Study*, Jacksonville, Florida. Http://www.communitiesinschools.org/media/uploads/attachments/CIS_RCT_Study_Jacksonville_Volume_4.pdf

ICF International. (2010). *Communities in Schools National Evaluation Volume 5: Randomized Controlled Trial Study*, Austin, Texas. Http://www.communitiesinschools.org/media/uploads/attachments/CIS_RCT_Study_Austin_Volume_5_final.pdf

Walsh, M., Foley, C., Denny, B.R., Coyle, J., & Howard, M. (2012). *The impact of City Connects* (Progress report 2012). Boston: Boston College Center for Optimized Student Support.

Walsh, M., Foley, C., Denny, B.R., Lindsay, L., Coyle, J., & Howard, M. (2011). *The impact of City Connects* (Annual report 2011). Boston: Boston College Center for Optimized Student Support.

Consultant teachers: Coaching

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

Program Description: Coaching is a form of job-embedded professional development for teachers. Coaching programs (sometimes called literacy coaching, mathematics coaching, instructional coaching, or other terms) 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.

Benefit-Cost Summary

Program benefits		Summary statistics	
Participants	$1,827	Benefit to cost ratio	$13.92
Taxpayers	$913	Benefits minus costs	$3,249
Other	$824	Probability of a positive net present value	87 %
Other indirect	($63)		
Total	$3,501		
Costs	($252)		
Benefits minus cost	$3,249		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2013). The economic discount rates and other relevant parameters are described in our technical manual.

Detailed Monetary Benefit Estimates

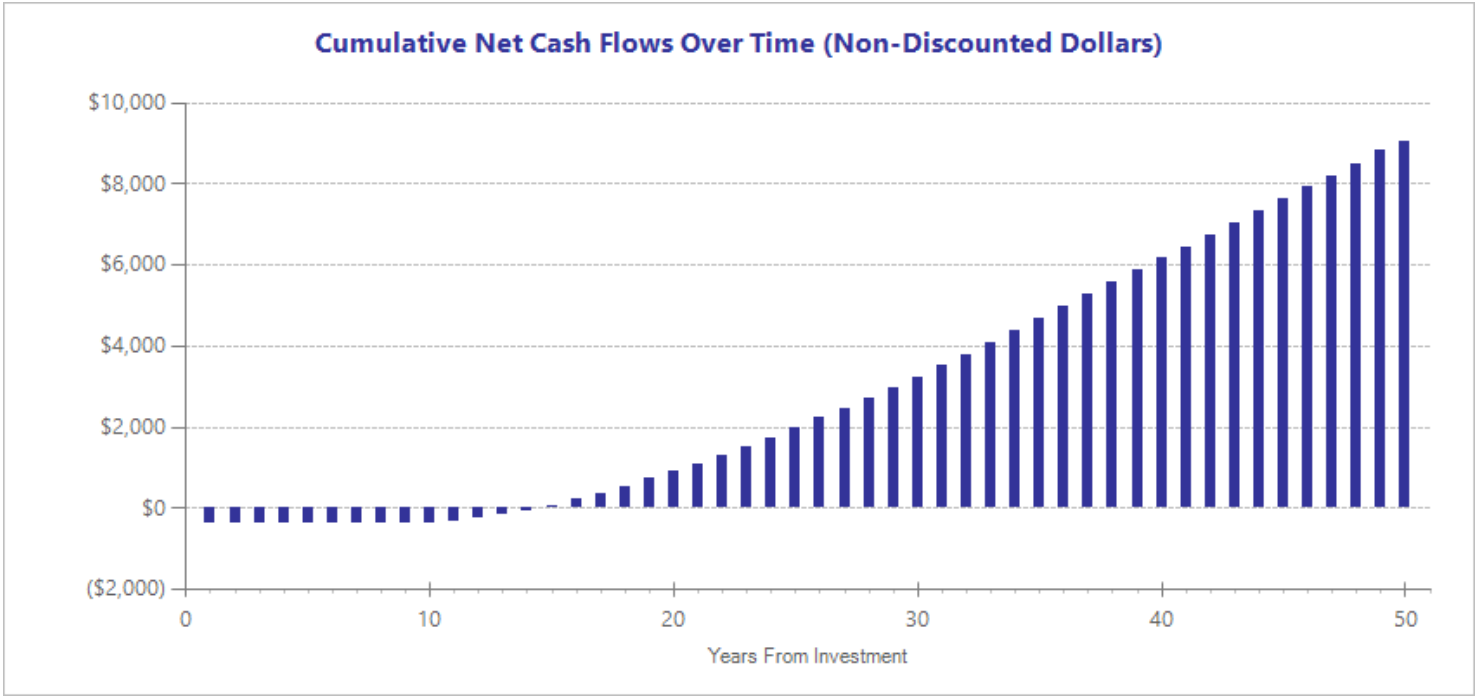
Source of benefits	Benefits to				
	Participants	Taxpayers	Other	Other indirect	Total benefits
From primary participant					
Crime	$0	$1	$4	$1	$6
Labor market earnings (test scores)	$1,843	$786	$912	$0	$3,542
Health care (educational attainment)	($16)	$125	($92)	$63	$80
Adjustment for deadweight cost of program	$0	$0	$0	($127)	($127)
Totals	$1,827	$913	$824	($63)	$3,501

Detailed Cost Estimates

	Annual cost	Program duration	Year dollars	Summary statistics	
Program costs	$252	1	2013	Present value of net program costs (in 2013 dollars)	($252)
Comparison costs	$0	1	2013	Uncertainty (+ 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 uncertainty range is used in Monte Carlo risk analysis, described in our technical manual.



Meta-Analysis of Program Effects

Outcomes measured	Primary or secondary participant	No. of effect sizes	Unadjusted effect size (random effects model)			Adjusted effect sizes and standard errors used in the benefit-cost analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Test scores	Primary	11	0.042	0.021	0.049	0.042	0.021	10	0.028	0.023	17
High school grad via test scores	Primary	n/a	n/a	n/a	n/a	0.007	0.006	18	0.007	0.006	17

Citations Used in the Meta-Analysis

Campbell, P.F., & Malkus, N.N. (2011). The impact of elementary mathematics coaches on student achievement. *The Elementary School Journal, 111*(3), 430-454.

Garet, M.S., Cronen, S., Eaton, M., Kurki, A., Ludwig, M., Jones, W., . . . Silverberg, M. (2008). *The impact of two professional development interventions on early reading instruction and achievement.* Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences.

Lockwood, J.R., McCombs, J.S., & Marsh, J. (2010). Linking reading coaches and student achievement: Evidence from Florida middle schools. *Educational Evaluation and Policy Analysis, 32*(3), 372-388.

Consultant teachers: Content-Focused Coaching

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

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

Program benefits		Summary statistics	
Participants	$4,204	Benefit to cost ratio	$145.83
Taxpayers	$2,105	Benefits minus costs	$8,250
Other	$1,882	Probability of a positive net present value	68 %
Other indirect	$116		
Total	$8,307		
Costs	($57)		
Benefits minus cost	$8,250		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2013). The economic discount rates and other relevant parameters are described in our technical manual.

Detailed Monetary Benefit Estimates

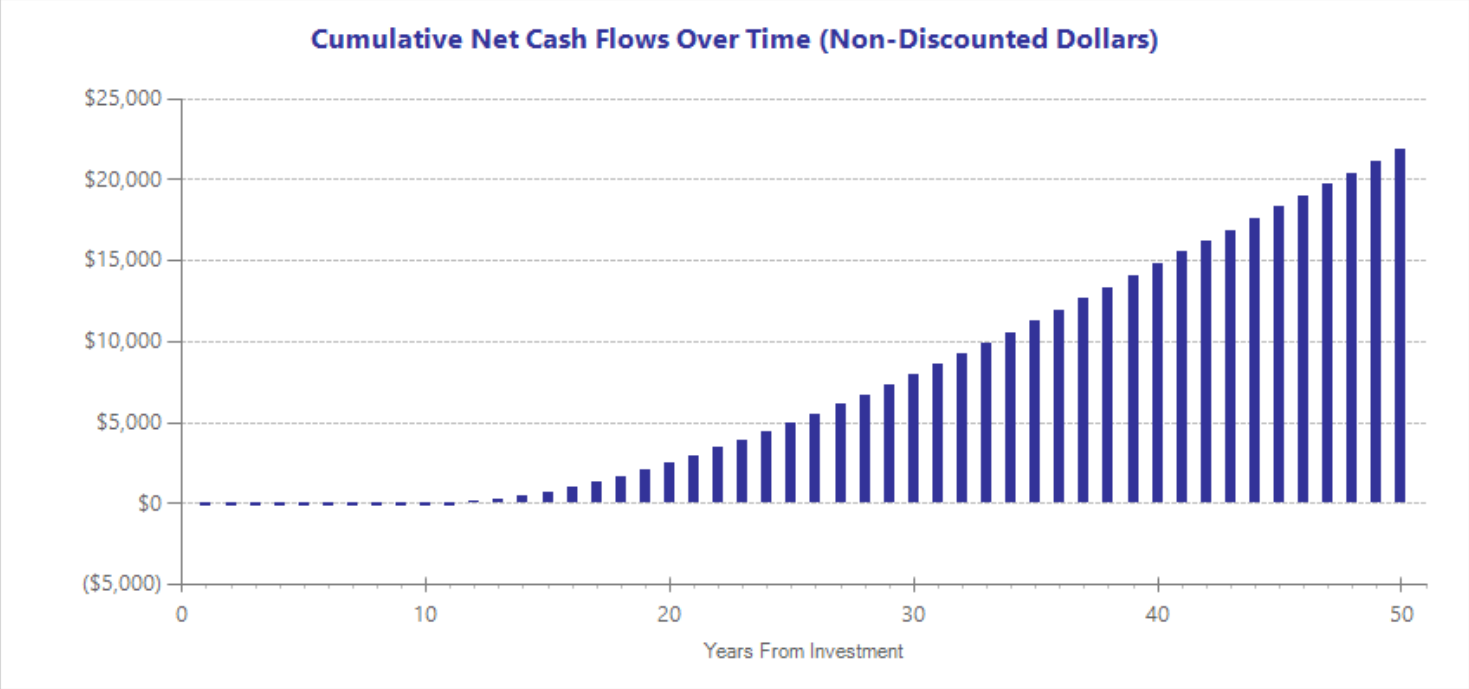
Source of benefits	Benefits to				
	Participants	Taxpayers	Other	Other indirect	Total benefits
From primary participant					
Crime	$0	$3	$8	$2	$13
Labor market earnings (test scores)	$4,241	$1,809	$2,089	$0	$8,140
Health care (educational attainment)	($37)	$292	($216)	$143	$182
Adjustment for deadweight cost of program	$0	$0	$0	($28)	($28)
Totals	$4,204	$2,105	$1,882	$116	$8,307

Detailed Cost Estimates

	Annual cost	Program duration	Year dollars	Summary statistics	
Program costs	$299	1	2013	Present value of net program costs (in 2013 dollars)	($57)
Comparison costs	$242	1	2013	Uncertainty (+ 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 calculate 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 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 uncertainty range is used in Monte Carlo risk analysis, described in our technical manual.



Meta-Analysis of Program Effects

Outcomes measured	Primary or secondary participant	No. of effect sizes	Unadjusted effect size (random effects model)			Adjusted effect sizes and standard errors used in the benefit-cost analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Test scores	Primary	1	0.250	0.131	0.056	0.107	0.131	9	0.064	0.144	17
High school grad via test scores	Primary	n/a	n/a	n/a	n/a	0.017	0.038	9	0.017	0.038	17

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.

Consultant teachers: Literacy Collaborative

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

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

Program benefits		Summary statistics	
Participants	$9,605	Benefit to cost ratio	$25.67
Taxpayers	$4,831	Benefits minus costs	$18,005
Other	$4,317	Probability of a positive net present value	89 %
Other indirect	($17)		
Total	$18,735		
Costs	($730)		
Benefits minus cost	$18,005		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2013). The economic discount rates and other relevant parameters are described in our technical manual.

Detailed Monetary Benefit Estimates

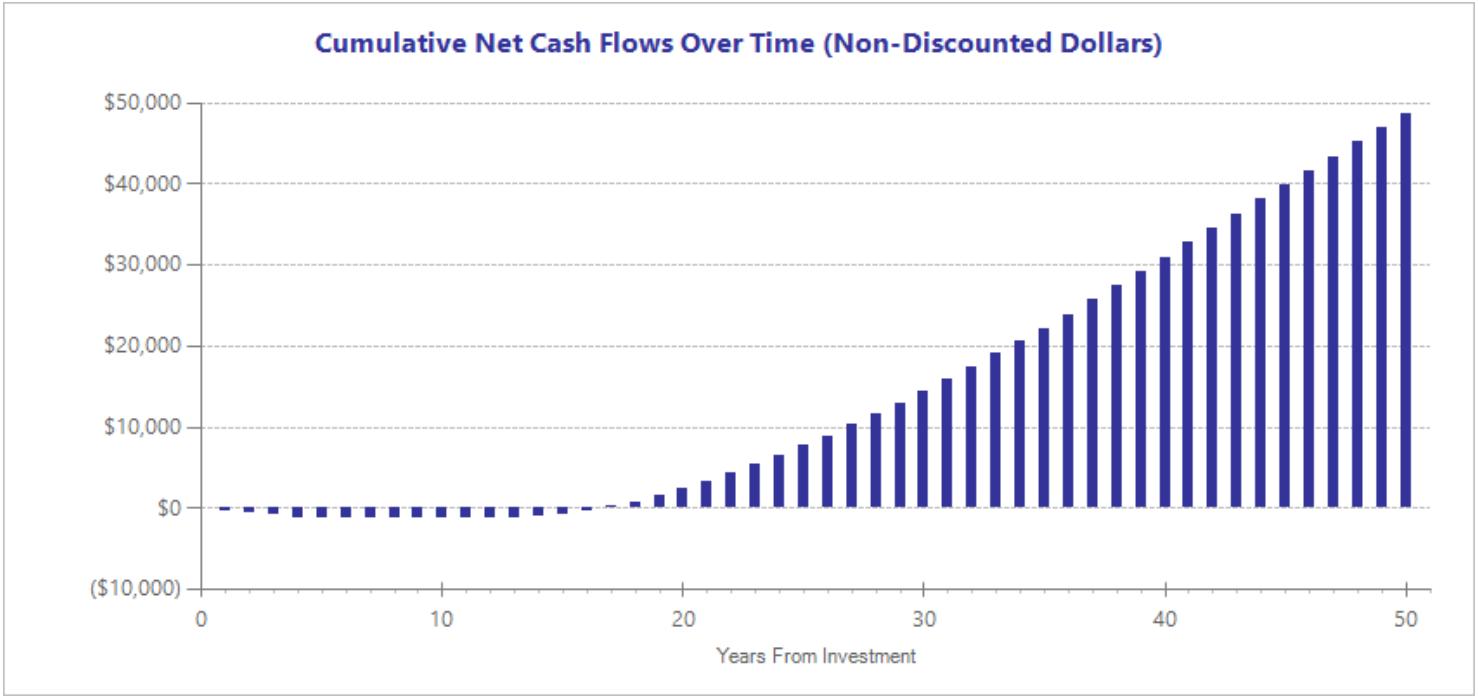
Source of benefits	Benefits to				
	Participants	Taxpayers	Other	Other indirect	Total benefits
From primary participant					
Crime	$0	$8	$21	$4	$33
Labor market earnings (test scores)	$9,693	$4,134	$4,804	$0	$18,630
Health care (educational attainment)	($88)	$689	($508)	$344	$437
Adjustment for deadweight cost of program	$0	$0	$0	($365)	($365)
Totals	$9,605	$4,831	$4,317	($17)	$18,735

Detailed Cost Estimates

	Annual cost	Program duration	Year dollars	Summary statistics	
Program costs	$192	4	2013	Present value of net program costs (in 2013 dollars)	($730)
Comparison costs	$0	1	2013	Uncertainty (+ or - %)	10 %

Cost is a WSIPP estimate 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 use 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 uncertainty range is used in Monte Carlo risk analysis, described in our technical manual.



Meta-Analysis of Program Effects

Outcomes measured	Primary or secondary participant	No. of effect sizes	Unadjusted effect size (random effects model)			Adjusted effect sizes and standard errors used in the benefit-cost analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Test scores	Primary	1	0.428	0.119	0.000	0.428	0.119	6	0.171	0.131	17
High school grad via test scores	Primary	n/a	n/a	n/a	n/a	0.046	0.035	18	0.046	0.035	17

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.

Consultant teachers: Online coaching

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

Program benefits		Summary statistics	
Participants	$5,700	Benefit to cost ratio	$58.97
Taxpayers	$2,879	Benefits minus costs	$11,060
Other	$2,554	Probability of a positive net present value	73 %
Other indirect	$117		
Total	$11,251		
Costs	($191)		
Benefits minus cost	$11,060		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2013). The economic discount rates and other relevant parameters are described in our technical manual.

Detailed Monetary Benefit Estimates

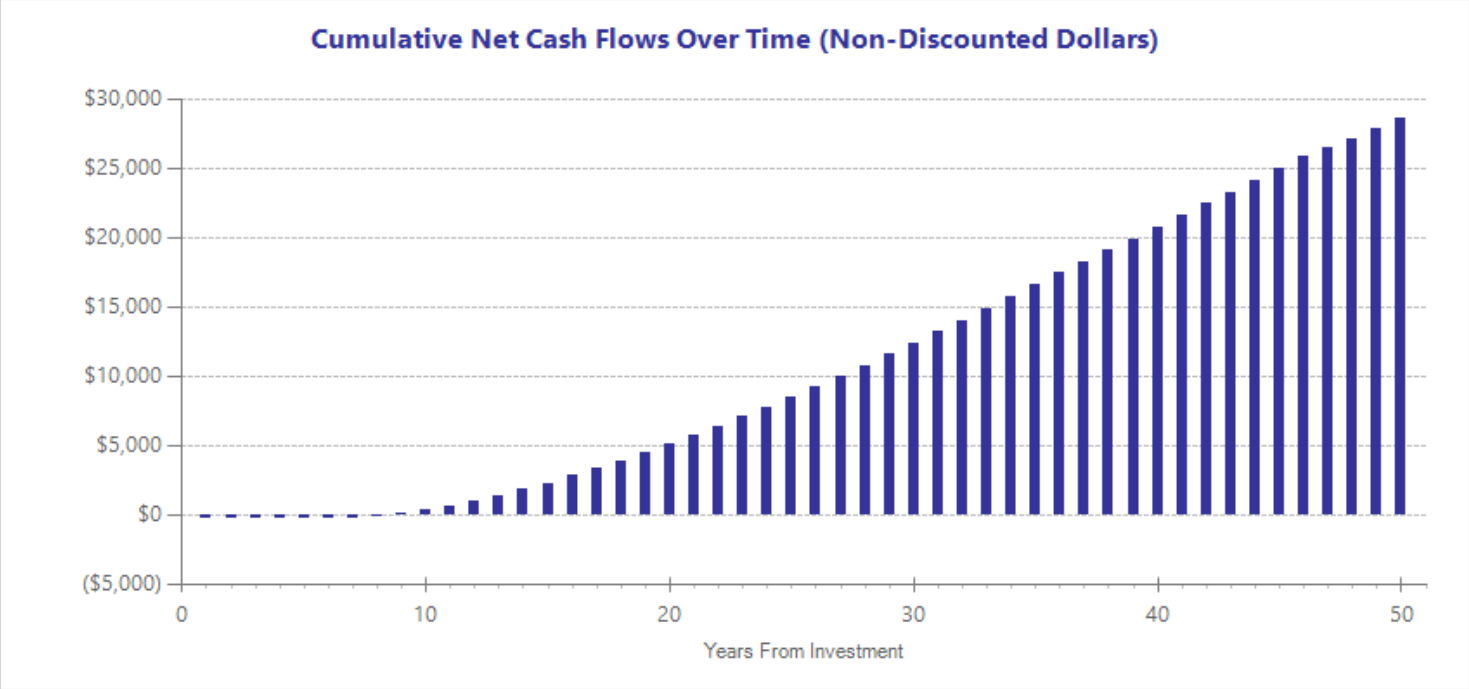
Source of benefits	Benefits to				
	Participants	Taxpayers	Other	Other indirect	Total benefits
From primary participant					
Crime	$0	$5	$14	$2	$21
Labor market earnings (test scores)	$5,754	$2,454	$2,851	$0	$11,060
Health care (educational attainment)	($54)	$420	($310)	$211	$267
Adjustment for deadweight cost of program	$0	$0	$0	($96)	($96)
Totals	$5,700	$2,879	$2,554	$117	$11,251

Detailed Cost Estimates

	Annual cost	Program duration	Year dollars	Summary statistics	
Program costs	$191	1	2013	Present value of net program costs (in 2013 dollars)	($191)
Comparison costs	$0	1	2013	Uncertainty (+ or - %)	10 %

In the evaluation included this analysis, teachers participated in an average of 20 hours of training and coaching time. We calculate the value of staff time using average Washington State compensation costs (including benefits) for 8th grade teachers as reported by the Office of the Superintendent of Public Instruction. We add additional costs reported in the evaluation to account for consultant time and video equipment. To calculate a per-student annual cost, we use 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 uncertainty range is used in Monte Carlo risk analysis, described in our technical manual.



Meta-Analysis of Program Effects

Outcomes measured	Primary or secondary participant	No. of effect sizes	Unadjusted effect size (random effects model)			Adjusted effect sizes and standard errors used in the benefit-cost analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Test scores	Primary	1	0.230	0.122	0.061	0.099	0.122	13	0.081	0.134	17
High school grad via test scores	Primary	n/a	n/a	n/a	n/a	0.022	0.035	18	0.022	0.035	17

Citations Used in the Meta-Analysis

Allen, J.P., Mikami, A.Y., Pianta, R.C., Gregory, A., & Lun, J. (2011). An interaction-based approach to enhancing secondary school instruction and student achievement. *Science, 333*(6045), 1034-1037.

Educator professional development: Use of data to guide instruction

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

Program Description: One form of professional development (PD) involves training educators how to use student academic assessment data to modify and improve instruction. In this "train the trainers" approach, administrators and 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

Program benefits		Summary statistics	
Participants	$303	Benefit to cost ratio	$33.10
Taxpayers	$143	Benefits minus costs	$567
Other	$141	Probability of a positive net present value	53 %
Other indirect	($2)		
Total	$585		
Costs	($18)		
Benefits minus cost	$567		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2013). The economic discount rates and other relevant parameters are described in our technical manual.

Detailed Monetary Benefit Estimates

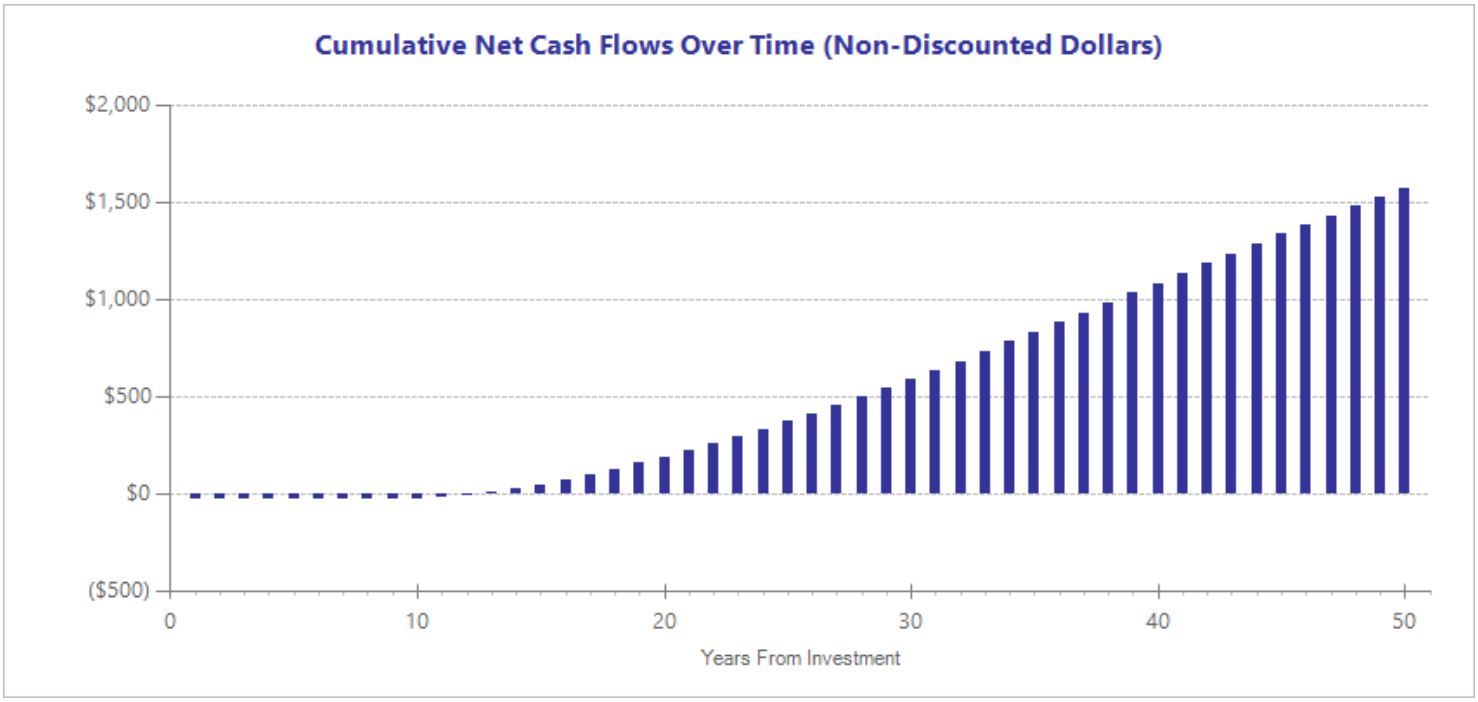
Source of benefits	Benefits to				
	Participants	Taxpayers	Other	Other indirect	Total benefits
From primary participant					
Crime	$0	$0	$1	$0	$1
Labor market earnings (test scores)	$305	$130	$150	$0	$585
Health care (educational attainment)	($2)	$13	($10)	$7	$8
Adjustment for deadweight cost of program	$0	$0	$0	($9)	($9)
Totals	$303	$143	$141	($2)	$585

Detailed Cost Estimates

	Annual cost	Program duration	Year dollars	Summary statistics	
Program costs	$18	1	2013	Present value of net program costs (in 2013 dollars)	($18)
Comparison costs	$0	1	2013	Uncertainty (+ 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 calculate 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 divide compensation costs by the number of students per classroom in Washington's prototypical schools formula and add per-student materials, supplies, and operating 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 uncertainty range is used in Monte Carlo risk analysis, described in our technical manual.



Meta-Analysis of Program Effects

Outcomes measured	Primary or secondary participant	No. of effect sizes	Unadjusted effect size (random effects model)			Adjusted effect sizes and standard errors used in the benefit-cost analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Test scores	Primary	2	0.007	0.052	0.894	0.007	0.052	10	0.004	0.057	17
High school grad via test scores	Primary	n/a	n/a	n/a	n/a	0.001	0.013	18	0.001	0.013	17

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.

Mentoring for students: community-based (taxpayer costs only)

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

Program Description: In community-based mentoring programs, volunteer adults are paired with at-risk middle- and high-school students to meet weekly at locations of their choosing for relationship building and guidance. Community-based organizations provide the adult mentors with training and oversight. Mentors are expected to build relationships with mentees with the aim of improving a variety of outcomes including crime rates, academic achievement, and substance abuse. This analysis includes evaluation findings for (in no particular order) the Washington State Mentors program, Big Brothers Big Sisters, Across Ages, Sponsor-a-Scholar, Career Beginnings, the Buddy System, and other locally developed programs.

Benefit-Cost Summary

Program benefits		Summary statistics	
Participants	$22,554	Benefit to cost ratio	$35.37
Taxpayers	$12,530	Benefits minus costs	$43,396
Other	$8,834	Probability of a positive net present value	84 %
Other indirect	$743		
Total	$44,660		
Costs	($1,264)		
Benefits minus cost	$43,396		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2013). The economic discount rates and other relevant parameters are described in our technical manual.

Detailed Monetary Benefit Estimates

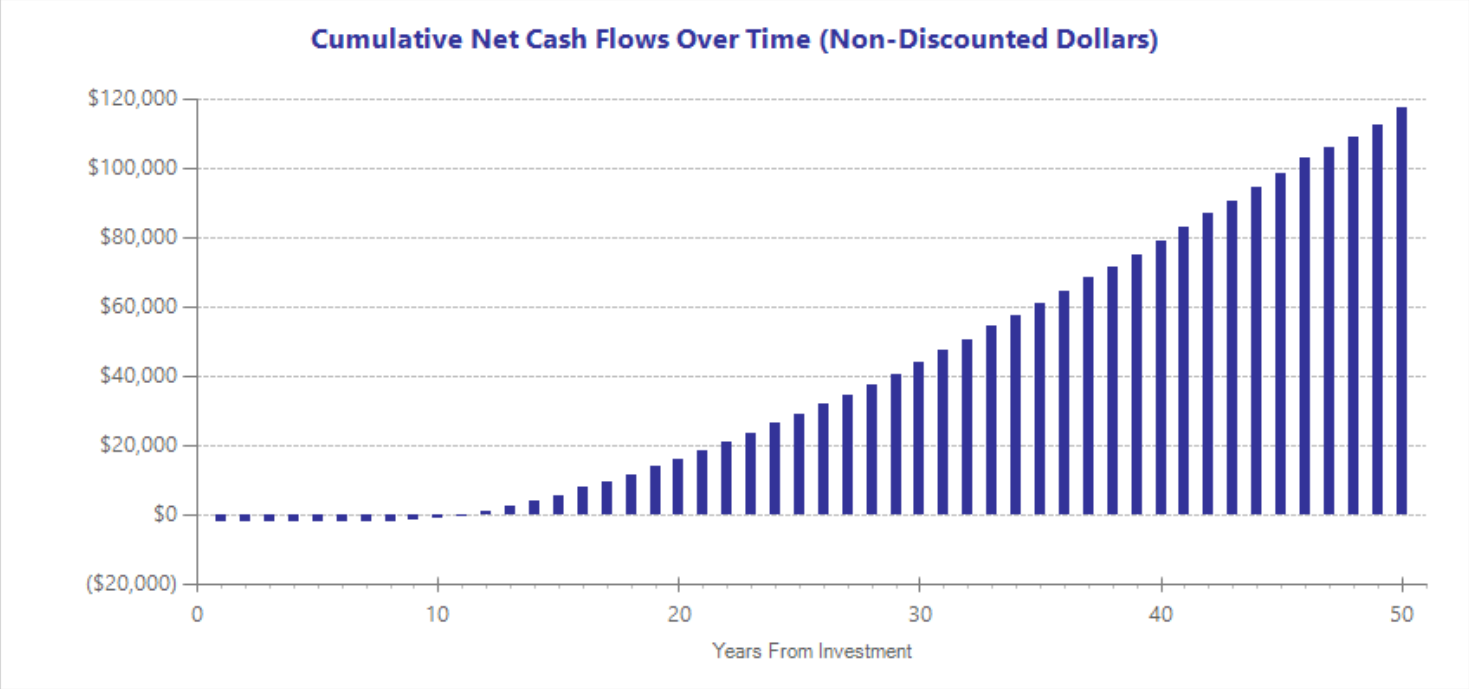
Source of benefits	Benefits to				
	Participants	Taxpayers	Other	Other indirect	Total benefits
From primary participant					
Crime	$0	($127)	($390)	($64)	($581)
Labor market earnings (hs grad)	$22,922	$9,777	$11,354	$0	$44,053
Property loss (alcohol abuse/dependence)	$1	$0	$1	$0	$2
Health care (educational attainment)	($368)	$2,880	($2,132)	$1,442	$1,822
Adjustment for deadweight cost of program	$0	$0	$0	($636)	($636)
Totals	$22,554	$12,530	$8,834	$743	$44,660

Detailed Cost Estimates

	Annual cost	Program duration	Year dollars	Summary statistics	
Program costs	$1,088	1	2005	Present value of net program costs (in 2013 dollars)	($1,264)
Comparison costs	$0	1	2005	Uncertainty (+ or - %)	10 %

Cost estimates are based on the Big Brothers/Big Sisters program as described in Herrera, C., Grossman, J.B., Kauh, T.J., Feldman, A.F., & McMaken, J. (2007). *Making a difference in schools: The Big Brothers Big Sisters school-based mentoring impact study.* Philadelphia, PA: Public/Private Ventures. Cost estimates exclude volunteer time and donated space.

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 uncertainty range is used in Monte Carlo risk analysis, described in our technical manual.



Meta-Analysis of Program Effects

Outcomes measured	Primary or secondary participant	No. of effect sizes	Unadjusted effect size (random effects model)			Adjusted effect sizes and standard errors used in the benefit-cost analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Grade point average	Primary	5	0.095	0.043	0.027	0.066	0.043	14	0.066	0.043	14
School attendance	Primary	4	0.047	0.052	0.702	0.003	0.052	14	0.003	0.052	14
High school graduation	Primary	2	0.293	0.143	0.040	0.154	0.143	18	0.154	0.143	18
Crime	Primary	6	0.093	0.041	0.025	0.042	0.041	14	0.042	0.041	24
Alcohol use before end of middle school	Primary	1	-0.295	0.219	0.178	-0.147	0.219	14	-0.147	0.219	14
Cannabis use before end of middle school	Primary	1	-0.179	0.219	0.412	-0.090	0.219	14	-0.090	0.219	14
Smoking in high school	Primary	1	-0.212	0.223	0.343	-0.159	0.223	17	-0.159	0.223	17
Illicit drug use in high school	Primary	1	-0.406	0.143	0.005	-0.203	0.143	17	-0.203	0.143	17

Citations Used in the Meta-Analysis

Aseltine, R.H., Dupre, M., & Lamlein, P. (2000). Mentoring as a drug prevention strategy: An evaluation of across ages. *Adolescent and Family Health, 1*(1), 11-20.

Buman, B., & Cain, R. (1991). *The impact of short term, work oriented mentoring on the employability of low-income youth.* (Available from Minneapolis Employment and Training Program, Minneapolis, MN).

Cave, G., & Quint, J. (1990). *Career Beginnings impact evaluation: Findings from a program for disadvantaged high school students.* New York: MDRC.

Fo, W.S.O., & O'Donnell, C.R. (1979). The Buddy System: Relationship and contingency conditions in a community intervention program for youth with nonprofessionals as behavior change agents. In J. S. Stumphauzer (Ed.), *Progress in behavior therapy with delinquents* (pp.302-316). Springfield, IL: Charles C. Thomas.

Grossman, J.B., & Tierney, J.P. (1998). Does mentoring work? An impact study of the Big Brothers Big Sisters program. *Evaluation Review, 22*(3), 403-426.

Hanlon, T.E., Bateman, R.W., Simon, B.D., O'Grady, K.E., & Carswell, S.B. (2002). An early community-based intervention for the prevention of substance abuse and other delinquent behavior. *Journal of Youth and Adolescence, 31*(6), 459-471.

Harmon, M.A. (1996). Reducing drug use among pregnant and parenting teens: A program evaluation and theoretical examination. *Dissertation Abstracts International, 56*(08), 3319A.

Herrera, C., DubBois, D.L., & Grossman, J.B. (2013). *The Role of Risk: Mentoring Experiences and Outcomes for Youth with Varying Risk Profiles.* Philadelphia, PA: Public/Private Ventures, MDRC.

Johnson, A. (1999). *Sponsor-a-Scholar: Long-term impacts of a youth mentoring program on student performance* (Document No. PR99-99). Princeton, NJ: Mathematica Policy Research.

O'Donnell, C.R., Lydgate, T., & Fo, W.S.O. (1979). The Buddy System: Review and follow-up. *Child Behavior Therapy,* 1, 161-169.

Mentoring for students: community-based (with volunteer costs)

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

Program Description: In community-based mentoring programs, volunteer adults are paired with at-risk middle- and high-school students to meet weekly at locations of their choosing for relationship building and guidance. Community-based organizations provide the adult mentors with training and oversight. Mentors are expected to build relationships with mentees with the aim of improving a variety of outcomes including crime rates, academic achievement, and substance abuse. This analysis includes evaluation findings (in no particular order) for the Washington State Mentors program, Big Brothers Big Sisters, Across Ages, Sponsor-a-Scholar, Career Beginnings, the Buddy System, and other, locally developed programs.

Benefit-Cost Summary

Program benefits		Summary statistics	
Participants	$22,728	Benefit to cost ratio	$13.80
Taxpayers	$12,544	Benefits minus costs	$40,787
Other	$8,957	Probability of a positive net present value	81 %
Other indirect	($248)		
Total	$43,980		
Costs	($3,193)		
Benefits minus cost	$40,787		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2013). The economic discount rates and other relevant parameters are described in our technical manual.

Detailed Monetary Benefit Estimates

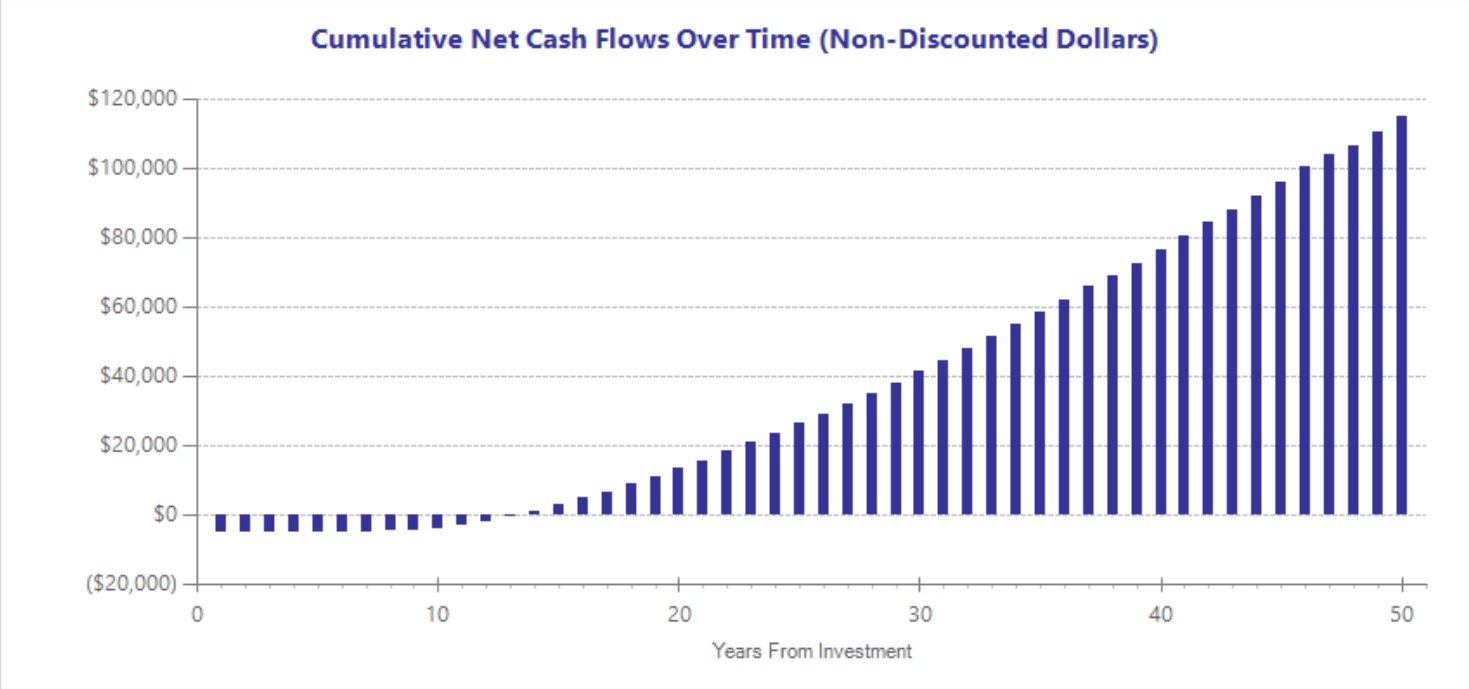
Source of benefits	Benefits to				
	Participants	Taxpayers	Other	Other indirect	Total benefits
From primary participant					
Crime	$0	($126)	($385)	($63)	($573)
Labor market earnings (hs grad)	$23,088	$9,848	$11,426	$0	$44,361
Property loss (alcohol abuse/dependence)	$1	$0	$1	$0	$2
Health care (educational attainment)	($360)	$2,822	($2,086)	$1,413	$1,789
Adjustment for deadweight cost of program	$0	$0	$0	($1,598)	($1,598)
Totals	$22,728	$12,544	$8,957	($248)	$43,980

Detailed Cost Estimates

	Annual cost	Program duration	Year dollars	Summary statistics	
Program costs	$2,748	1	2005	Present value of net program costs (in 2013 dollars)	($3,193)
Comparison costs	$0	1	2005	Uncertainty (+ or - %)	10 %

Cost estimates are based on the Big Brothers/Big Sisters program as described in Herrera, C., Grossman, J.B., Kauh, T.J., Feldman, A.F., & McMaken, J. (2007). *Making a difference in schools: The Big Brothers Big Sisters school-based mentoring impact study.* Philadelphia, PA: Public/Private Ventures. The cost of volunteer time is based on the Office of Financial Management State Data Book average adult salary for 2012 multiplied by 1.44 to account for benefits. In the evaluated community-based programs, mentors meet with mentees, on average, once per week over the course of one year. Cost estimates exclude donated space.

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 uncertainty range is used in Monte Carlo risk analysis, described in our technical manual.



Meta-Analysis of Program Effects

Outcomes measured	Primary or secondary participant	No. of effect sizes	Unadjusted effect size (random effects model)			Adjusted effect sizes and standard errors used in the benefit-cost analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Grade point average	Primary	5	0.095	0.043	0.027	0.066	0.043	14	0.066	0.043	14
School attendance	Primary	4	0.047	0.052	0.702	0.003	0.052	14	0.003	0.052	14
High school graduation	Primary	2	0.293	0.143	0.040	0.154	0.143	18	0.154	0.143	18
Crime	Primary	6	0.093	0.041	0.025	0.042	0.041	14	0.042	0.041	24
Alcohol use before end of middle school	Primary	1	-0.295	0.219	0.178	-0.147	0.219	14	-0.147	0.219	14
Cannabis use before end of middle school	Primary	1	-0.179	0.219	0.412	-0.090	0.219	14	-0.090	0.219	14
Smoking in high school	Primary	1	-0.212	0.223	0.343	-0.159	0.223	17	-0.159	0.223	17
Illicit drug use in high school	Primary	1	-0.406	0.143	0.005	-0.203	0.143	17	-0.203	0.143	17

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Harmon, M.A. (1996). Reducing drug use among pregnant and parenting teens: A program evaluation and theoretical examination. *Dissertation Abstracts International, 56*(08), 3319A.

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O'Donnell, C.R., Lydgate, T., & Fo, W.S.O. (1979). The Buddy System: Review and follow-up. *Child Behavior Therapy,* 1, 161-169.

Mentoring for students: school-based (taxpayer costs only)

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

Program Description: In school-based mentoring programs, mentors and students meet weekly at school for one-to-one relationship building and guidance. Mentors are adult volunteers, school staff, or high school students. Community-based organizations coordinate with school staff and provide mentors with training and oversight. The programs included in this analysis are (in no particular order) the national Student Mentoring Program, Big Brothers Big Sisters, Project CHANCE, SMILE, and other locally developed programs.

Benefit-Cost Summary

Program benefits		Summary statistics	
Participants	$36,413	Benefit to cost ratio	$64.46
Taxpayers	$20,486	Benefits minus costs	$72,594
Other	$15,060	Probability of a positive net present value	80 %
Other indirect	$1,781		
Total	$73,739		
Costs	($1,146)		
Benefits minus cost	$72,594		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2013). The economic discount rates and other relevant parameters are described in our technical manual.

Detailed Monetary Benefit Estimates

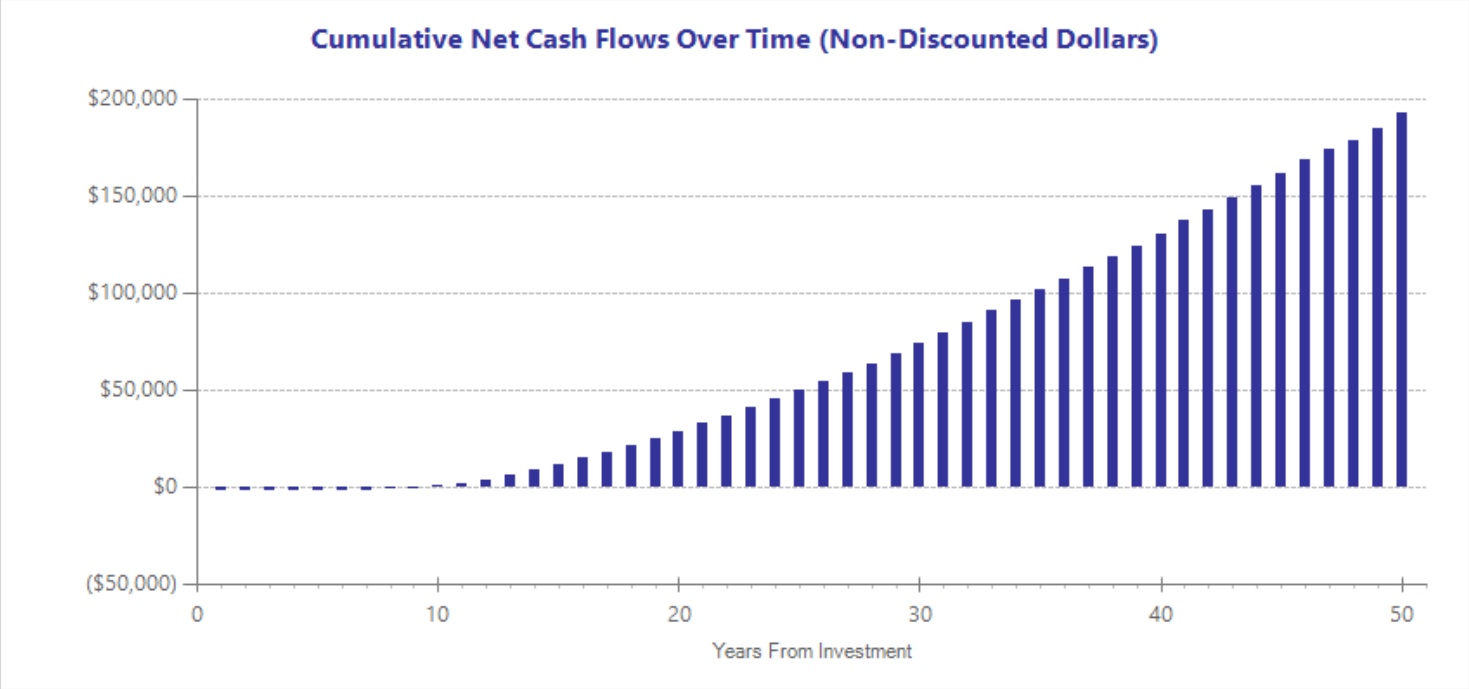
Source of benefits	Benefits to				
	Participants	Taxpayers	Other	Other indirect	Total benefits
From primary participant					
Crime	$0	$62	$189	$31	$282
Labor market earnings (hs grad)	$37,005	$15,784	$18,296	$0	$71,085
Health care (educational attainment)	($592)	$4,640	($3,425)	$2,324	$2,947
Adjustment for deadweight cost of program	$0	$0	$0	($574)	($574)
Totals	$36,413	$20,486	$15,060	$1,781	$73,739

Detailed Cost Estimates

	Annual cost	Program duration	Year dollars	Summary statistics	
Program costs	$987	1	2005	Present value of net program costs (in 2013 dollars)	($1,146)
Comparison costs	$0	1	2005	Uncertainty (+ or - %)	10 %

Cost estimates are based on the Big Brothers/Big Sisters program as described in Herrera, C., Grossman, J.B., Kauh, T.J., Feldman, A.F., & McMaken, J. (2007). *Making a difference in schools: The Big Brothers Big Sisters school-based mentoring impact study.* Philadelphia, PA: Public/Private Ventures. Cost estimates exclude volunteer time and donated space.

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 uncertainty range is used in Monte Carlo risk analysis, described in our technical manual.



Meta-Analysis of Program Effects

Outcomes measured	Primary or secondary participant	No. of effect sizes	Unadjusted effect size (random effects model)			Adjusted effect sizes and standard errors used in the benefit-cost analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Office discipline referrals	Primary	2	-0.518	0.157	0.133	-0.163	0.157	14	-0.163	0.157	14
Grade point average	Primary	5	0.078	0.062	0.212	0.040	0.062	14	0.040	0.062	14
Crime	Primary	2	-0.020	0.091	0.664	-0.020	0.091	14	-0.020	0.091	24
High school graduation	Primary	2	0.689	0.316	0.029	0.258	0.316	18	0.258	0.316	18
Illicit drug use before end of middle school	Primary	1	0.109	0.145	0.452	0.055	0.145	13	0.029	0.110	14
School attendance	Primary	4	0.149	0.083	0.072	0.075	0.083	14	0.075	0.083	14

Citations Used in the Meta-Analysis

Bernstein, L., Rappaport, C. D., Olsho, L., Hunt, D., Levin, M. (with Dyous, C., . . . Rhodes, W.) (2009). *Impact evaluation of the U.S. Department of Education's Student Mentoring Program: Final report.* Washington, DC : National Center for Education Evaluation and Regional Assistance.

Converse, N., & Lignugaris-Kraft, B. (2008). Evaluation of a school-based mentoring program for at-risk middle school youth. *Remedial and Special Education, 30*(1), 33-46.

DeSocio, J., VanCura, M., Nelson, L.A., Hewitt, G., Kitzman, H., & Cole, R. (2007). Engaging truant adolescents: Results from a multifaceted intervention pilot. *Preventing School Failure, 51*(3), 3-9.

Flaherty, B.P. (1985). An experiment in mentoring for high school students assigned to basic courses. *Dissertation Abstracts International, 46*(02), 352A.

Herrera, C., Grossman, J.B., Kauh, T.J., & McMaken, J. (2011). Mentoring in schools: An impact study of Big Brothers Big Sisters school-based mentoring. *Child Development, 82*(1), 346-361.

Karcher, M.J. (2008). The study of mentoring in the learning environment (SMILE): A randomized evaluation of the effectiveness of school-based mentoring. *Prevention Science, 9*(2), 99-113.

Mentoring for students: school-based (with volunteer costs)

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

Program Description: In school-based mentoring programs, mentors and students meet weekly at school for one-to-one relationship building and guidance. Mentors are adult volunteers, school staff, or high school students. Community-based organizations coordinate with school staff and provide mentors with training and oversight. The programs included in this analysis are (in no particular order) the national Student Mentoring Program, Big Brothers Big Sisters, Project CHANCE, SMILE, and other, locally developed programs.

Benefit-Cost Summary

Program benefits		Summary statistics	
Participants	$35,383	Benefit to cost ratio	$40.00
Taxpayers	$19,982	Benefits minus costs	$69,550
Other	$14,539	Probability of a positive net present value	79 %
Other indirect	$1,433		
Total	$71,337		
Costs	($1,787)		
Benefits minus cost	$69,550		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2013). The economic discount rates and other relevant parameters are described in our technical manual.

Detailed Monetary Benefit Estimates

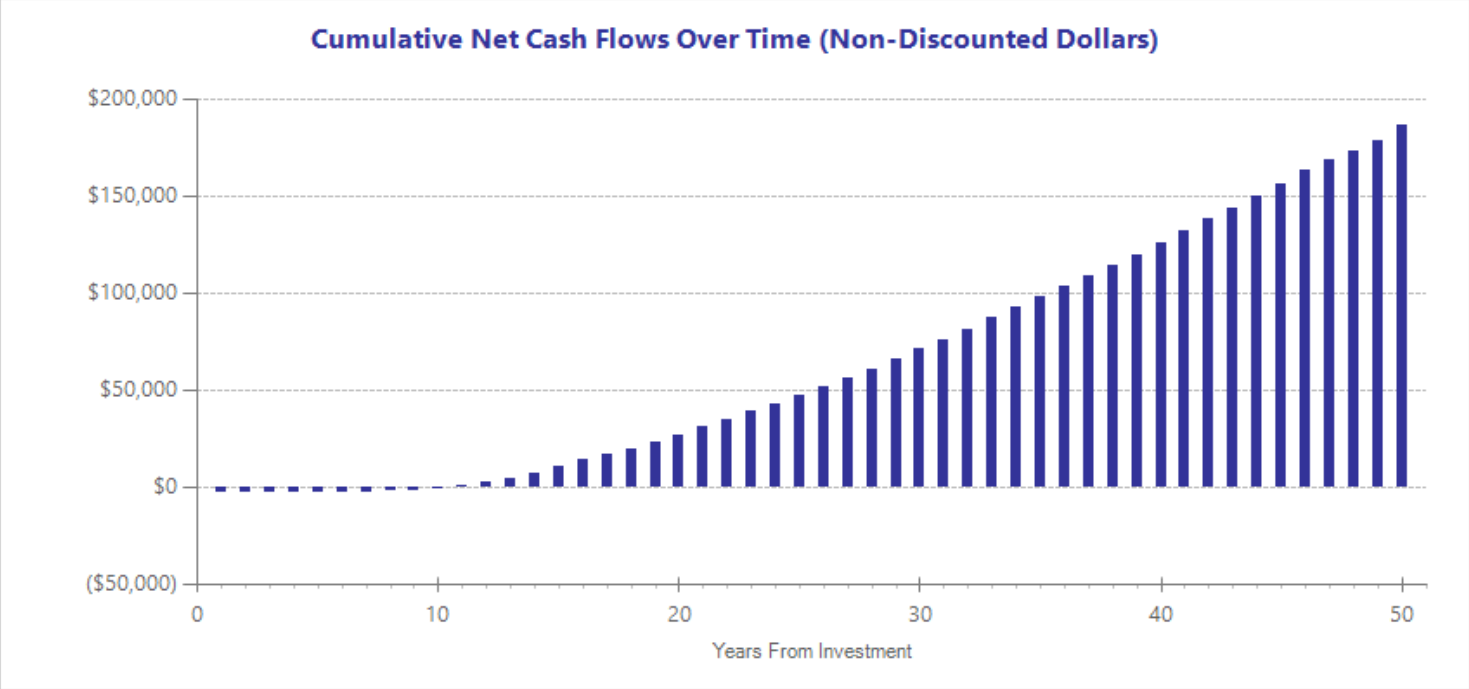
Source of benefits	Benefits to				
	Participants	Taxpayers	Other	Other indirect	Total benefits
From primary participant					
Crime	$0	$63	$194	$33	$290
Labor market earnings (hs grad)	$35,967	$15,341	$17,728	$0	$69,037
Health care (educational attainment)	($585)	$4,578	($3,383)	$2,303	$2,913
Adjustment for deadweight cost of program	$0	$0	$0	($902)	($902)
Totals	$35,383	$19,982	$14,539	$1,433	$71,337

Detailed Cost Estimates

	Annual cost	Program duration	Year dollars	Summary statistics	
Program costs	$1,539	1	2005	Present value of net program costs (in 2013 dollars)	($1,787)
Comparison costs	$0	1	2005	Uncertainty (+ or - %)	10 %

Cost estimates are based on the Big Brothers/Big Sisters program as described in Herrera, C., Grossman, J.B., Kauh, T.J., Feldman, A.F., & McMaken, J. (2007). *Making a difference in schools: The Big Brothers Big Sisters school-based mentoring impact study.* Philadelphia, PA: Public/Private Ventures. The cost of volunteer time is based on the Office of Financial Management State Data Book average adult salary for 2012 multiplied by 1.44 to account for benefits. In the evaluated school-based programs, mentors meet with mentees, on average, once per week during the school year. Approximately half of the mentors in the evaluated programs were high school students and were not included in the volunteer cost estimates. Cost estimates exclude donated space.

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 uncertainty range is used in Monte Carlo risk analysis, described in our technical manual.



Meta-Analysis of Program Effects

Outcomes measured	Primary or secondary participant	No. of effect sizes	Unadjusted effect size (random effects model)			Adjusted effect sizes and standard errors used in the benefit-cost analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Office discipline referrals	Primary	2	-0.518	0.157	0.133	-0.163	0.157	14	-0.163	0.157	14
Grade point average	Primary	5	0.078	0.062	0.212	0.040	0.062	14	0.040	0.062	14
Crime	Primary	2	-0.020	0.091	0.664	-0.020	0.091	14	-0.020	0.091	24
High school graduation	Primary	2	0.689	0.316	0.029	0.258	0.316	18	0.258	0.316	18
Illicit drug use before end of middle school	Primary	1	0.109	0.145	0.452	0.055	0.145	13	0.029	0.110	14
School attendance	Primary	4	0.149	0.083	0.072	0.075	0.083	14	0.075	0.083	14

Citations Used in the Meta-Analysis

Bernstein, L., Rappaport, C.D., Olsho, L., Hunt, D., Levin, M. (with Dyous, C., . . . Rhodes, W.) (2009). *Impact evaluation of the U.S. Department of Education's Student Mentoring Program: Final report.* Washington, DC : National Center for Education Evaluation and Regional Assistance.

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Karcher, M.J. (2008). The study of mentoring in the learning environment (SMILE): A randomized evaluation of the effectiveness of school-based mentoring. *Prevention Science, 9*(2), 99-113.

Out-of-school-time tutoring by adults

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

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

Benefit-Cost Summary

Program benefits		Summary statistics	
Participants	$3,671	Benefit to cost ratio	$7.47
Taxpayers	$1,841	Benefits minus costs	$5,920
Other	$1,651	Probability of a positive net present value	75 %
Other indirect	($326)		
Total	$6,837		
Costs	($917)		
Benefits minus cost	$5,920		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2013). The economic discount rates and other relevant parameters are described in our technical manual.

Detailed Monetary Benefit Estimates

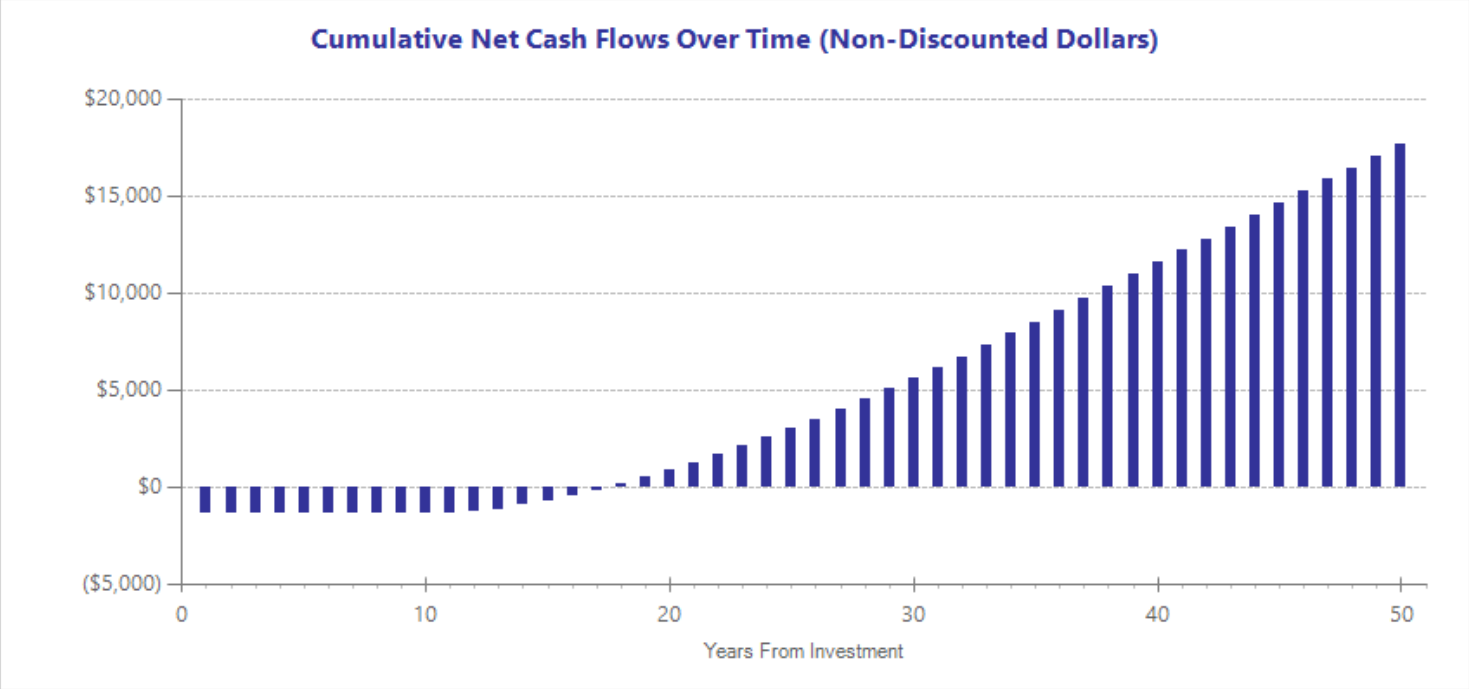
Source of benefits	Benefits to				
	Participants	Taxpayers	Other	Other indirect	Total benefits
From primary participant					
Crime	$0	$3	$8	$1	$13
Labor market earnings (test scores)	$3,704	$1,580	$1,833	$0	$7,117
Health care (educational attainment)	($33)	$258	($191)	$129	$164
Adjustment for deadweight cost of program	$0	$0	$0	($457)	($457)
Totals	$3,671	$1,841	$1,651	($326)	$6,837

Detailed Cost Estimates

	Annual cost	Program duration	Year dollars	Summary statistics	
Program costs	$917	1	2013	Present value of net program costs (in 2013 dollars)	($917)
Comparison costs	$0	1	2013	Uncertainty (+ 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.

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 uncertainty range is used in Monte Carlo risk analysis, described in our technical manual.



Meta-Analysis of Program Effects

Outcomes measured	Primary or secondary participant	No. of effect sizes	Unadjusted effect size (random effects model)			Adjusted effect sizes and standard errors used in the benefit-cost analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Test scores	Primary	6	0.252	0.061	0.028	0.099	0.061	9	0.059	0.067	17
High school grad via test scores	Primary	n/a	n/a	n/a	n/a	0.016	0.018	18	0.016	0.018	17

Citations Used in the Meta-Analysis

Baker, S., Gersten, R., & Keating, T. (2000). When less may be more: A 2-year longitudinal evaluation of a volunteer tutoring program requiring minimal training. *Reading Research Quarterly, 35*(4), 494-519.

McKinney, A.D. (1995). The effects of an after-school tutorial and enrichment program on the academic achievement and self-concept of below grade level first and second grade students. *Dissertation Abstracts International, 56*(06), 2176A.

Meier, J.D., & Invernizzi, M. (2001). Book Buddies in the Bronx: Testing a model for America Reads. *Journal of Education for Students Placed at Risk, 6*(4), 319-33.

Morris, D., Shaw, B., & Perney, J. (1990). Helping low readers in grades 2 and 3: An after-school volunteer tutoring program. *Elementary School Journal, 91*(2), 133-150.

Vadasy, P.F., Jenkins, J.R., Antil, L.R., Wayne, S.K., & O'Connor, R.E. (1997). The effectiveness of one-to-one tutoring by community tutors for at-risk beginning readers. *Learning Disability Quarterly, 20*(2), 126-139.

Zimmer, R., Hamilton, L., & Christina, R. (2010). After-school tutoring in the context of No Child Left Behind: Effectiveness of two programs in the Pittsburgh Public Schools. *Economics of Education Review, 29*(1), 18-28.

Parents as tutors with teacher oversight

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

Program benefits		Summary statistics	
Participants	$1,621	Benefit to cost ratio	$3.58
Taxpayers	$828	Benefits minus costs	$2,042
Other	$719	Probability of a positive net present value	54 %
Other indirect	($331)		
Total	$2,836		
Costs	($795)		
Benefits minus cost	$2,042		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2013). The economic discount rates and other relevant parameters are described in our technical manual.

Detailed Monetary Benefit Estimates

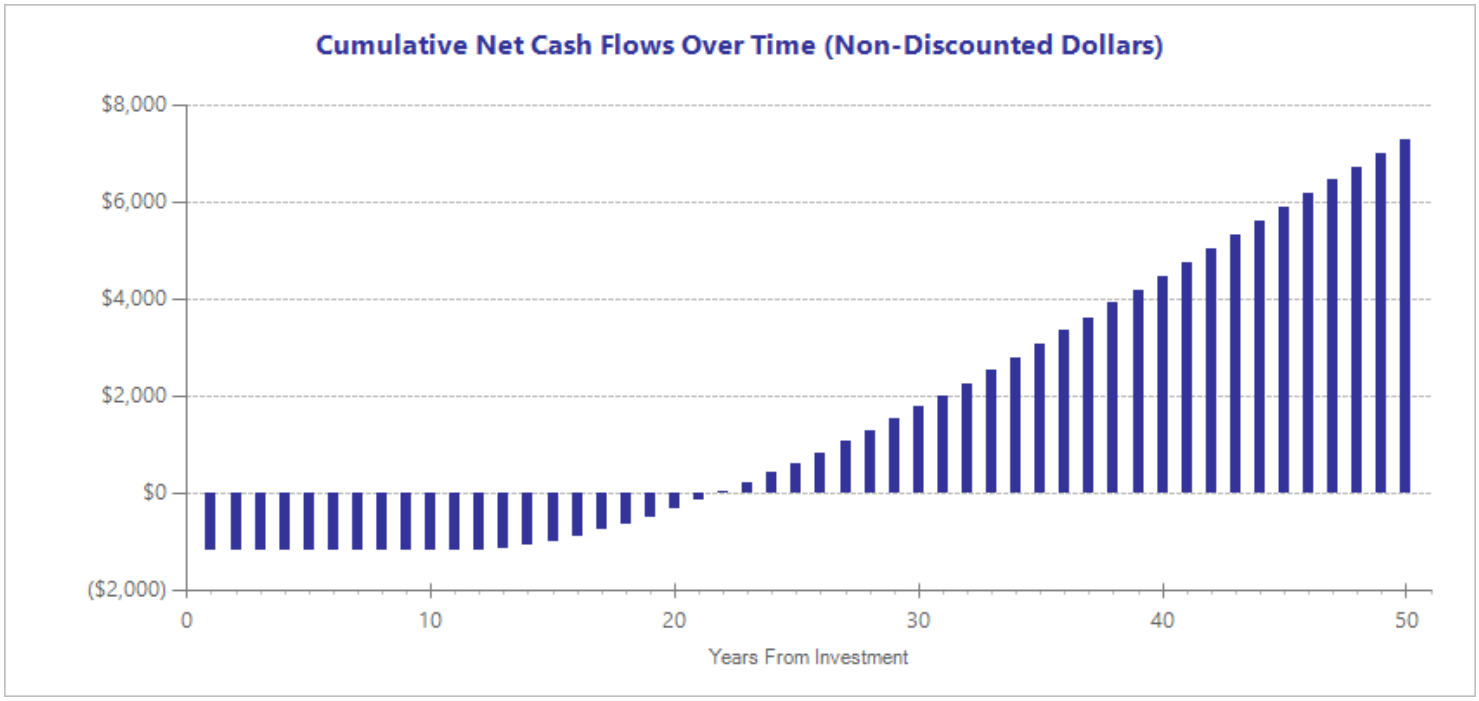
Source of benefits	Benefits to				
	Participants	Taxpayers	Other	Other indirect	Total benefits
From primary participant					
Crime	$0	$1	$4	$1	$6
Labor market earnings (test scores)	$1,637	$698	$809	$0	$3,145
Health care (educational attainment)	($16)	$128	($94)	$64	$82
Adjustment for deadweight cost of program	$0	$0	$0	($396)	($396)
Totals	$1,621	$828	$719	($331)	$2,836

Detailed Cost Estimates

	Annual cost	Program duration	Year dollars	Summary statistics	
Program costs	$794	1	2013	Present value of net program costs (in 2013 dollars)	($795)
Comparison costs	$0	1	2013	Uncertainty (+ 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 calculate 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 uncertainty range is used in Monte Carlo risk analysis, described in our technical manual.



Meta-Analysis of Program Effects

Outcomes measured	Primary or secondary participant	No. of effect sizes	Unadjusted effect size (random effects model)			Adjusted effect sizes and standard errors used in the benefit-cost analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Test scores	Primary	9	0.167	0.116	0.149	0.050	0.116	9	0.027	0.128	17
High school grad via test scores	Primary	n/a	n/a	n/a	n/a	0.007	0.034	18	0.007	0.034	17

Citations Used in the Meta-Analysis

Erion, R.J. (1994). Parent tutoring, reading instruction and curricular assessment. *Dissertation Abstracts International, 54*(11), 4035A.

Fantuzzo, J.W., Davis, G.Y. & Ginsburg, M.D. (1995). Effects of parent involvement in isolation or in combination with peer tutoring on student self-concept and mathematics achievement. *Journal of Educational Psychology, 87*(2), 272-281.

Heller, L R., & Fantuzzo, J.W. (1993). Reciprocal peer tutoring and parent partnership: Does parent involvement make a difference? *School Psychology Review, 22*(3), 517-534.

Mehran, M., & White, K.R. (1988). Parent tutoring as a supplement to compensatory education for first-grade children. *Remedial and Special Education, 9*(3), 35-41.

Miller, B.V., & Kratochwill, T.R. (1996). An evaluation of the Paired Reading Program using competency-based training. *School Psychology International, 17*(3), 269-291.

Nielson, B.B. (1992). Effects of parent and volunteer tutoring on reading achievement of third grade at-risk students. *Dissertation Abstracts International, 52*(10), 3570A.

Powell-Smith, K.A., Shinn, M R., Stoner, G., & Good, R.H., III. (2000). Parent tutoring in reading using literature and curriculum materials: Impact on student reading achievement. *School Psychology Review, 29*(1), 5-27.

Rodick, J.D., & Henggeler, S.W. (1980). The short-term and long-term amelioration of academic and motivational deficiencies among low-achieving inner-city adolescents. *Child Development, 51*(4), 1126-1132.

School-wide positive behavior programs

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

Program Description: Some K–12 schools operate school-wide student behavior improvement programs as one way to focus the school environment on learning (rather than discipline or other issues). These programs are often described as "positive behavior" interventions or systems and include specific programs such as School-wide Positive Behavioral Interventions and Supports, Positive Action, and the Responsive Classroom. The programs encourage pro-social behavior for all students. (In contrast, other interventions target problem behaviors among troubled students who are not the focus of this analysis.) School-wide behavior programs typically include a specialized curriculum, professional development for teachers and staff, and encouragement of and rewards for positive behaviors such as being on time and listening in the classroom.

Benefit-Cost Summary

Program benefits		Summary statistics	
Participants	$14,836	Benefit to cost ratio	$141.61
Taxpayers	$7,977	Benefits minus costs	$31,001
Other	$7,725	Probability of a positive net present value	99 %
Other indirect	$684		
Total	$31,222		
Costs	($221)		
Benefits minus cost	$31,001		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2013). The economic discount rates and other relevant parameters are described in our technical manual.

Detailed Monetary Benefit Estimates

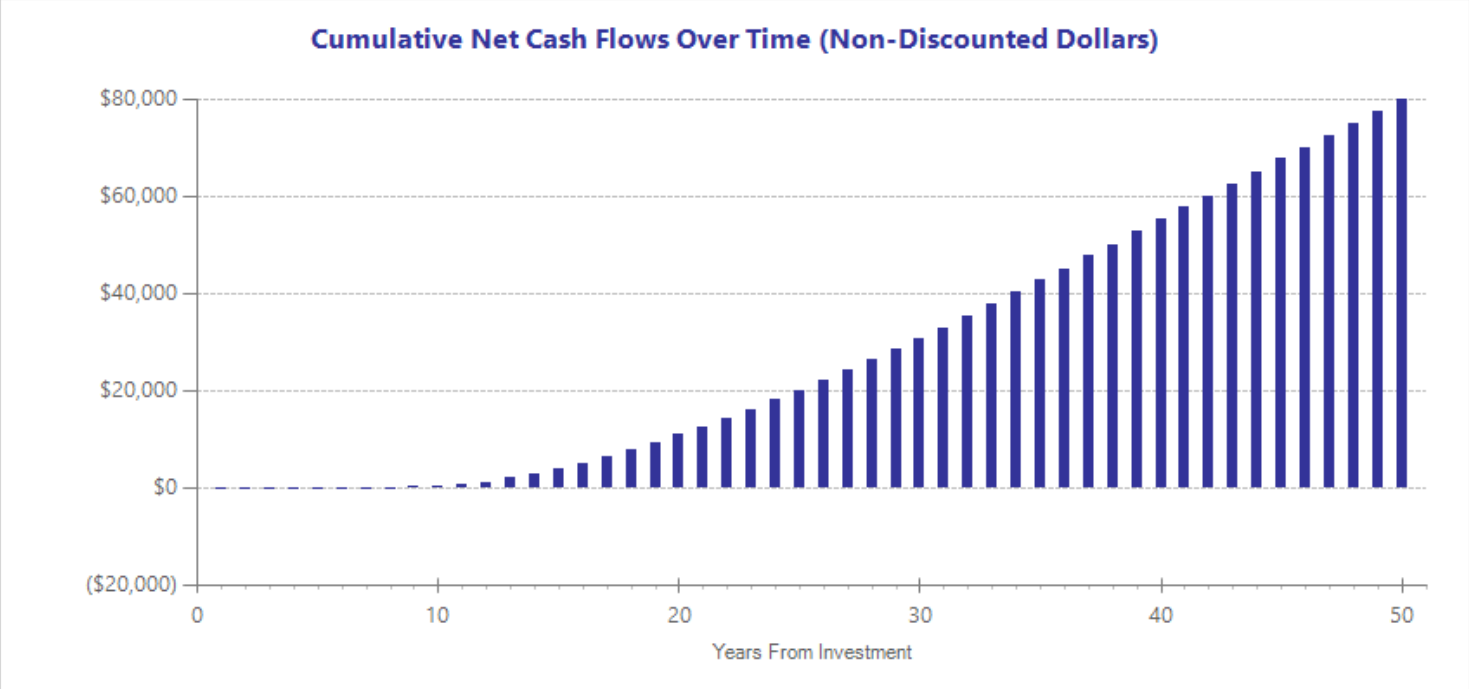
Source of benefits	Benefits to				
	Participants	Taxpayers	Other	Other indirect	Total benefits
From primary participant					
Crime	$0	$397	$1,140	$198	$1,735
Labor market earnings (test scores)	$14,974	$6,387	$7,389	$0	$28,750
K-12 grade repetition	$0	$104	$0	$52	$156
Health care (educational attainment)	($139)	$1,088	($803)	$544	$690
Adjustment for deadweight cost of program	$0	$0	$0	($110)	($110)
Totals	$14,836	$7,977	$7,725	$684	$31,222

Detailed Cost Estimates

	Annual cost	Program duration	Year dollars	Summary statistics	
Program costs	$221	1	2013	Present value of net program costs (in 2013 dollars)	($221)
Comparison costs	$0	1	2013	Uncertainty (+ or - %)	10 %

Costs are WSIPP estimates based on a model for the total cost for implementation as described in Blonigen, B.A., Harbaugh, W.T., Singell, L.D., Horner, R.H., Irvin, L.K., & Smolkowski, K.S. (2008). Application of economic analysis to school-wide positive behavior support (SWPBS) programs. *Journal of Positive Behavior Interventions, 10*(1), 5-19. The cost estimate assumes district-wide implementation of a positive behavior program in ten schools. We calculate the value of staff time using average Washington State compensation costs (including benefits) as reported by the Office of the Superintendent of Public Instruction. 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 uncertainty range is used in Monte Carlo risk analysis, described in our technical manual.



Meta-Analysis of Program Effects

Outcomes measured	Primary or secondary participant	No. of effect sizes	Unadjusted effect size (random effects model)			Adjusted effect sizes and standard errors used in the benefit-cost analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Test scores	Primary	7	0.452	0.103	0.000	0.403	0.103	9	0.242	0.113	17
Crime	Primary	2	-0.644	0.054	0.000	-0.148	0.054	9	-0.148	0.054	19
K-12 grade repetition	Primary	1	-0.307	0.007	0.000	-0.307	0.007	9	-0.307	0.007	17
High school grad via test scores	Primary	n/a	n/a	n/a	n/a	0.065	0.031	18	0.065	0.031	17
Suspensions/expulsions	Primary	1	-0.318	0.007	0.000	-0.318	0.007	9	-0.318	0.007	18

Citations Used in the Meta-Analysis

Flay, B.R., Allred, C.G., & Ordway, N. (2001). Effects of the positive action program on achievement and discipline: Two matched-control comparisons. *Prevention Science, 2*(2), 71-89.

Horner, R.H., Smolkowski, K., Todd, A.W., Esperanza, J., Sugai, G., Eber, L., & Nakasato, J. (2009). A randomized, wait-list controlled effectiveness trial assessing school-wide positive behavior support in elementary schools. *Journal of Positive Behavior Interventions, 11*(3), 133-144.

Rimm-Kaufman, S., Fan, X., Chiu, Y., & You, W. (2007). The contribution of the Responsive Classroom approach on children's academic achievement: Results from a three year longitudinal study. *Journal of School Psychology,* 45, 401-421.

Snyder, F., Vuchinich, S., Acock, A., Washburn, I., Beets, M., & Li, K. (2010). Impact of the Positive Action program on school-level indicators of academic achievement, absenteeism, and disciplinary outcomes: A matched-pair, cluster randomized, controlled trial. *Journal of Research on Educational Effectiveness, 3*(1), 26-55.

Summer book programs: Multi-year intervention

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

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.

Benefit-Cost Summary

Program benefits		Summary statistics	
Participants	$6,013	Benefit to cost ratio	$55.95
Taxpayers	$3,017	Benefits minus costs	$11,630
Other	$2,701	Probability of a positive net present value	72 %
Other indirect	$110		
Total	$11,842		
Costs	($212)		
Benefits minus cost	$11,630		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2013). The economic discount rates and other relevant parameters are described in our technical manual.

Detailed Monetary Benefit Estimates

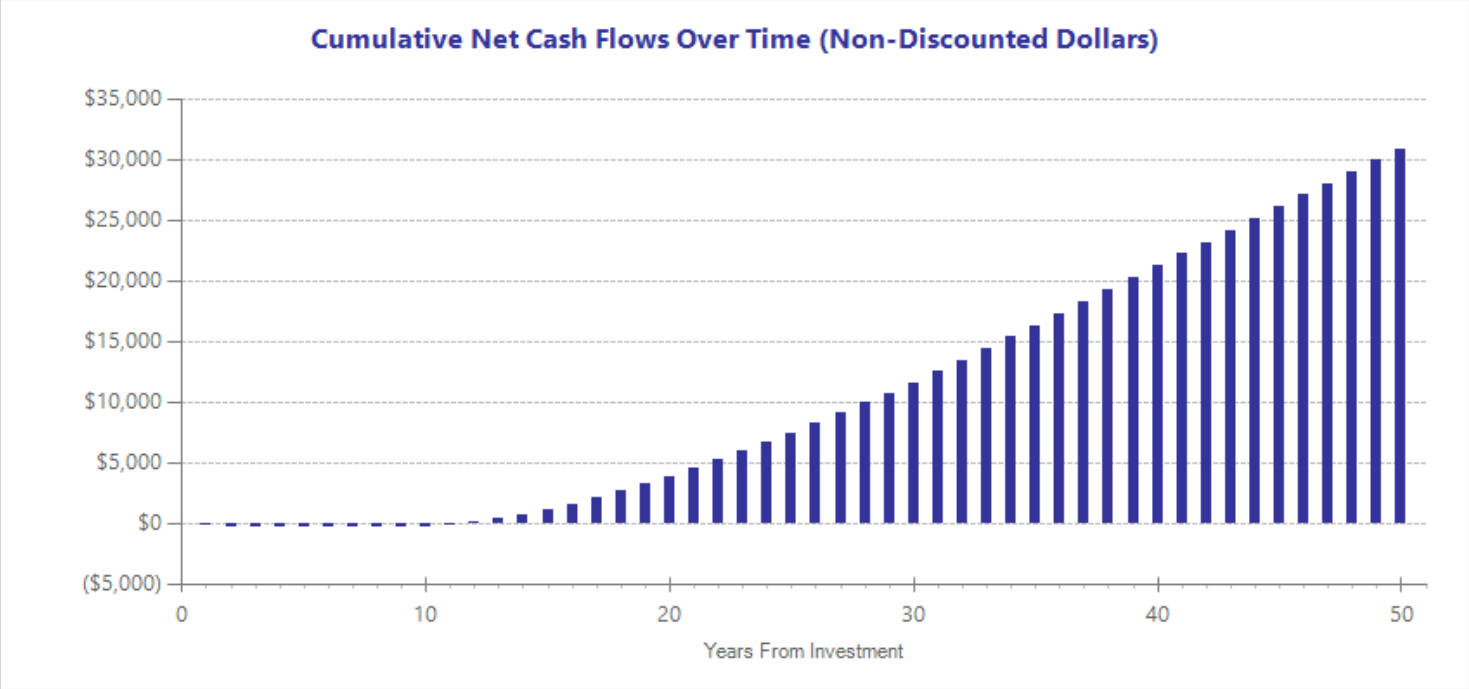
Source of benefits	Benefits to				
	Participants	Taxpayers	Other	Other indirect	Total benefits
From primary participant					
Crime	$0	$5	$13	$2	$20
Labor market earnings (test scores)	$6,068	$2,588	$3,002	$0	$11,658
Health care (educational attainment)	($54)	$424	($314)	$214	$270
Adjustment for deadweight cost of program	$0	$0	$0	($106)	($106)
Totals	$6,013	$3,017	$2,701	$110	$11,842

Detailed Cost Estimates

	Annual cost	Program duration	Year dollars	Summary statistics	
Program costs	$73	3	2013	Present value of net program costs (in 2013 dollars)	($212)
Comparison costs	$0	3	2013	Uncertainty (+ or - %)	10 %

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. 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 uncertainty range is used in Monte Carlo risk analysis, described in our technical manual.



Meta-Analysis of Program Effects

Outcomes measured	Primary or secondary participant	No. of effect sizes	Unadjusted effect size (random effects model)			Adjusted effect sizes and standard errors used in the benefit-cost analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Test scores	Primary	1	0.138	0.147	0.346	0.138	0.147	10	0.091	0.162	17
High school grad via test scores	Primary	n/a	n/a	n/a	n/a	0.025	0.040	18	0.025	0.040	17

Citations Used in the Meta-Analysis

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

Summer book programs: One-year intervention

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

Program Description: The summer book programs included in this analysis provide free books to elementary school students. Generally, the goals of summer book programs include increases in 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

Program benefits		Summary statistics	
Participants	$98	Benefit to cost ratio	$2.69
Taxpayers	$110	Benefits minus costs	$133
Other	$8	Probability of a positive net present value	50 %
Other indirect	($6)		
Total	$210		
Costs	($77)		
Benefits minus cost	$133		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2013). The economic discount rates and other relevant parameters are described in our technical manual.

Detailed Monetary Benefit Estimates

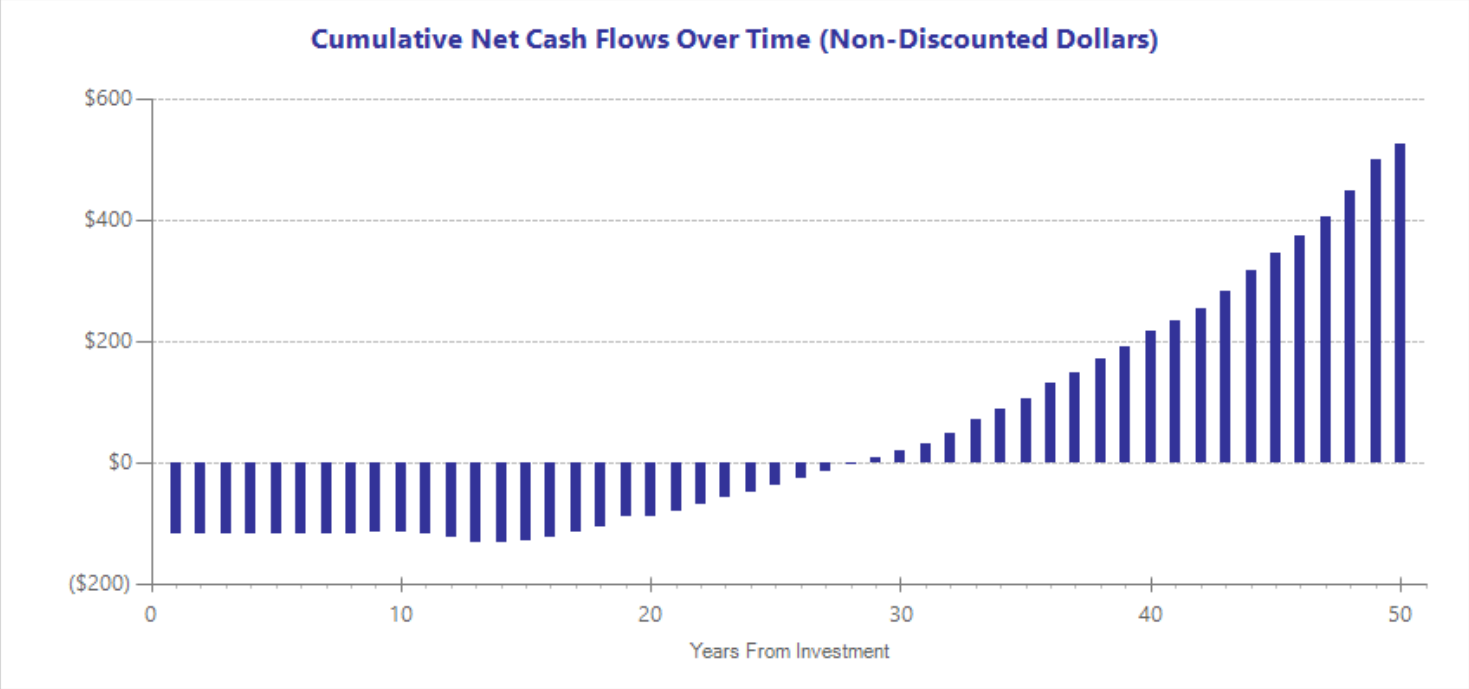
Source of benefits	Benefits to				
	Participants	Taxpayers	Other	Other indirect	Total benefits
From primary participant					
Crime	$0	$1	$2	$0	$3
Labor market earnings (hs grad)	$498	$212	$246	$0	$956
Labor market earnings (test scores)	($392)	($167)	($193)	$0	($752)
Health care (educational attainment)	($8)	$64	($47)	$32	$41
Adjustment for deadweight cost of program	$0	$0	$0	($38)	($38)
Totals	$98	$110	$8	($6)	$210

Detailed Cost Estimates

	Annual cost	Program duration	Year dollars	Summary statistics	
Program costs	$77	1	2013	Present value of net program costs (in 2013 dollars)	($77)
Comparison costs	$0	1	2013	Uncertainty (+ or - %)	10 %

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. 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 uncertainty range is used in Monte Carlo risk analysis, described in our technical manual.



Meta-Analysis of Program Effects

Outcomes measured	Primary or secondary participant	No. of effect sizes	Unadjusted effect size (random effects model)			Adjusted effect sizes and standard errors used in the benefit-cost analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Test scores	Primary	3	0.019	0.061	0.752	0.019	0.061	9	0.013	0.067	17
High school grad via test scores	Primary	n/a	n/a	n/a	n/a	0.004	0.018	18	0.004	0.018	17

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.

Summer book programs: One-year intervention, with additional support

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

Program Description: The summer book programs included in this analysis provide free books to students paired with additional reading support (e.g., lessons from certified teachers). Generally, the goals of summer book programs include increases in 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

Program benefits		Summary statistics	
Participants	$1,831	Benefit to cost ratio	$31.54
Taxpayers	$944	Benefits minus costs	$3,481
Other	$798	Probability of a positive net present value	60 %
Other indirect	$22		
Total	$3,595		
Costs	($114)		
Benefits minus cost	$3,481		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2013). The economic discount rates and other relevant parameters are described in our technical manual.

Detailed Monetary Benefit Estimates

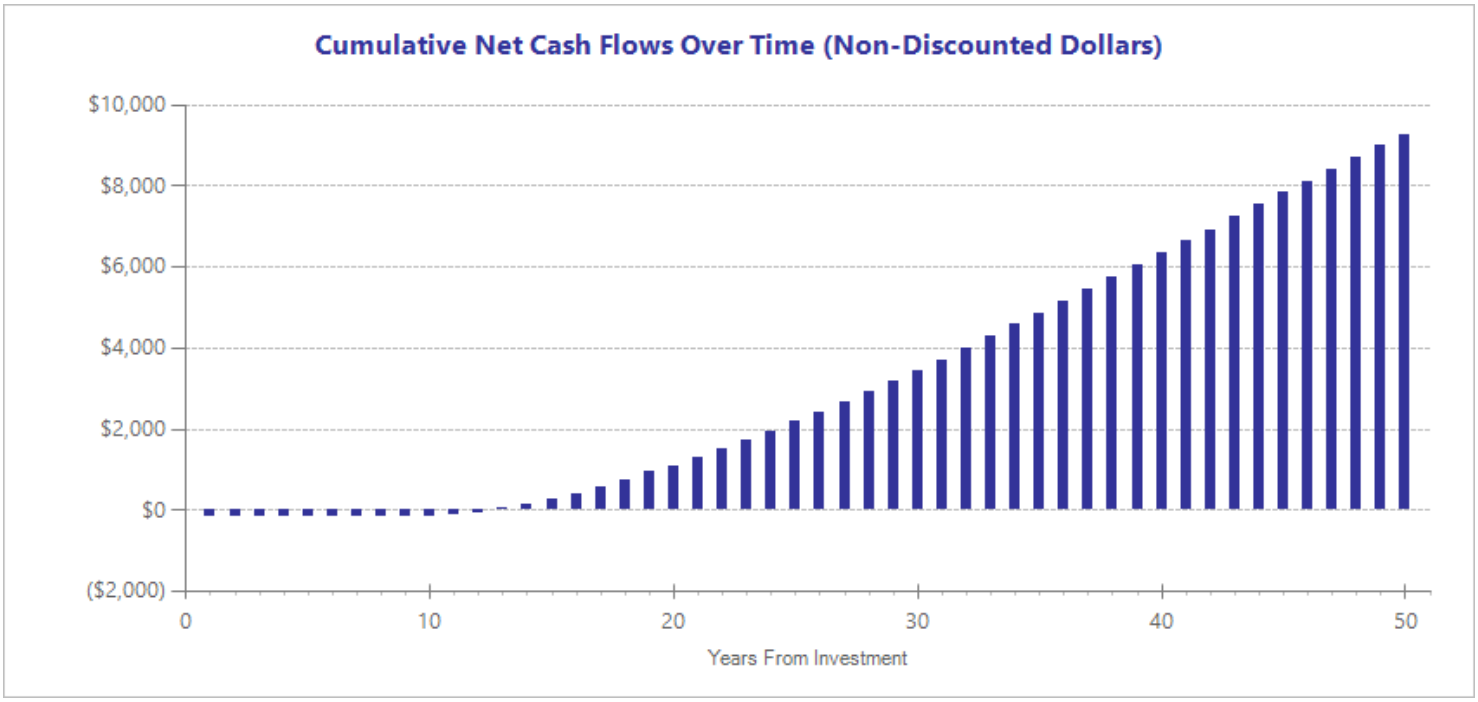
Source of benefits	Benefits to				
	Participants	Taxpayers	Other	Other indirect	Total benefits
From primary participant					
Crime	$0	$2	$4	$1	$7
Labor market earnings (test scores)	$1,851	$789	$907	$0	$3,547
Health care (educational attainment)	($20)	$153	($113)	$78	$98
Adjustment for deadweight cost of program	$0	$0	$0	($57)	($57)
Totals	$1,831	$944	$798	$22	$3,595

Detailed Cost Estimates

	Annual cost	Program duration	Year dollars	Summary statistics	
Program costs	$114	1	2013	Present value of net program costs (in 2013 dollars)	($114)
Comparison costs	$0	1	2013	Uncertainty (+ or - %)	10 %

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 class time and time to administer the program. 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 uncertainty range is used in Monte Carlo risk analysis, described in our technical manual.



Meta-Analysis of Program Effects

Outcomes measured	Primary or secondary participant	No. of effect sizes	Unadjusted effect size (random effects model)			Adjusted effect sizes and standard errors used in the benefit-cost analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Test scores	Primary	4	0.079	0.106	0.455	0.044	0.106	10	0.029	0.117	17
High school grad via test scores	Primary	n/a	n/a	n/a	n/a	0.008	0.028	18	0.008	0.028	17

Citations Used in the Meta-Analysis

Kim, J.S. (2006). Effects of a voluntary summer reading intervention on reading achievement: Results from a randomized field trial. *Educational Evaluation and Policy Analysis, 28*(4), 335-355.

Kim, J.S., & Guryan, J. (2010). The efficacy of a voluntary summer book reading intervention for low-income Latino children from language minority families. *Journal of Educational Psychology, 102*(1), 20-31.

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.

Pagan, S. (2010). *Children reading for pleasure: Investigating predictors of reading achievement and the efficacy of a paired-reading intervention to foster children's literacy skills.* (Doctoral dissertation, Carleton University, 2010, UMI No. NR70556).

Summer learning programs: Academically focused

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

Program Description: This analysis includes a variety of summer learning programs 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

Program benefits		Summary statistics	
Participants	$3,049	Benefit to cost ratio	$4.85
Taxpayers	$1,528	Benefits minus costs	$4,355
Other	$1,369	Probability of a positive net present value	93 %
Other indirect	($459)		
Total	$5,488		
Costs	($1,133)		
Benefits minus cost	$4,355		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2013). The economic discount rates and other relevant parameters are described in our technical manual.

Detailed Monetary Benefit Estimates

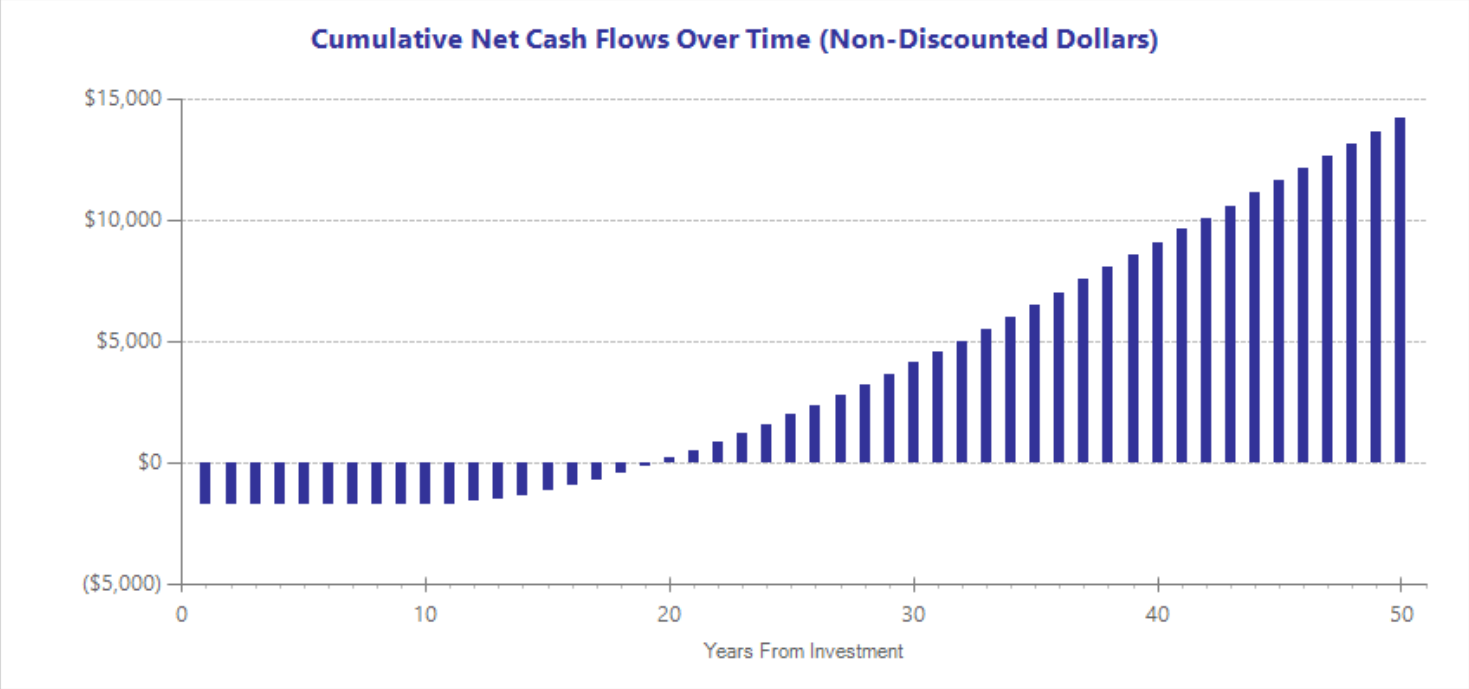
Source of benefits	Benefits to				
	Participants	Taxpayers	Other	Other indirect	Total benefits
From primary participant					
Crime	$0	$2	$7	$1	$10
Labor market earnings (test scores)	$3,076	$1,312	$1,520	$0	$5,909
Health care (educational attainment)	($27)	$213	($158)	$107	$136
Adjustment for deadweight cost of program	$0	$0	$0	($567)	($567)
Totals	$3,049	$1,528	$1,369	($459)	$5,488

Detailed Cost Estimates

	Annual cost	Program duration	Year dollars	Summary statistics	
Program costs	$1,132	1	2013	Present value of net program costs (in 2013 dollars)	($1,133)
Comparison costs	$0	1	2013	Uncertainty (+ 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 use 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 uncertainty range is used in Monte Carlo risk analysis, described in our technical manual.



Meta-Analysis of Program Effects

Outcomes measured	Primary or secondary participant	No. of effect sizes	Unadjusted effect size (random effects model)			Adjusted effect sizes and standard errors used in the benefit-cost analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Test scores	Primary	13	0.080	0.019	0.000	0.081	0.019	9	0.049	0.021	17
High school grad via test scores	Primary	n/a	n/a	n/a	n/a	0.013	0.005	18	0.013	0.005	17

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.

Borman, G.D., Goetz, M. E., & Dowling, N.M. (2009). Halting the summer achievement slide: A randomized field trial of the KindergARTen summer camp. *Journal of Education for Students Placed at Risk, 14*(2), 133-147.

Chaplin, D., & Capizzano, J. (2006). *Impacts of a summer learning program: A random assignment study of Building Educated Leaders for Life (BELL)*. Washington DC: Urban Institute.

Geis, R. (1968). *A preventive summer program for kindergarten children likely to fail in first grade reading, Final Report*. La Canada, CA: La Canada Unified School District.

Jacob, B.A., & Lefgren, L. (2004). Remedial education and student achievement: A regression-discontinuity analysis. *The Review of Economics and Statistics, 86*(1), 226-244.

Mariano, L.T., & Martorell, P. (2013). The academic effects of summer instruction and retention in New York City. *Educational Evaluation and Policy Analysis, 35*(1), 96-117.

Matsudaira, J.D. (2008). Mandatory summer school and student achievement. *Journal of Econometrics, 142*(2), 829-850.

Opalinski, G.B. (2006). *The effects of a middle school summer school program on the achievement of NCLB identified subgroups* (Doctoral dissertation, University of Oregon, 2006, UMI No. 3224110).

Schacter, J., & Jo, B. (2005). Learning when school is not in session: A reading summer day-camp intervention to improve the achievement of exiting first-grade students who are economically disadvantaged. *Journal of Research in Reading, 28*(2), 158-169.

Zvoch, K., & Stevens, J. (2011). Summer school and summer learning: An examination of the short- and longer-term changes in student literacy. *Early Education & Development, 22*(4), 649-675.

Zvoch, K., & Stevens, J. J. (2013). Summer school effects in a randomized field trial. *Early Childhood Research Quarterly, 28*(1), 24-32.

Teacher professional development: Induction/mentoring

Benefit-cost estimates updated July 2014. Literature review updated July 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 in comparison with less-intensive programs.

Benefit-Cost Summary

Program benefits		Summary statistics	
Participants	$1,209	Benefit to cost ratio	$32.11
Taxpayers	$604	Benefits minus costs	$2,285
Other	$543	Probability of a positive net present value	61 %
Other indirect	$4		
Total	$2,360		
Costs	($74)		
Benefits minus cost	$2,285		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2013). The economic discount rates and other relevant parameters are described in our technical manual.

Detailed Monetary Benefit Estimates

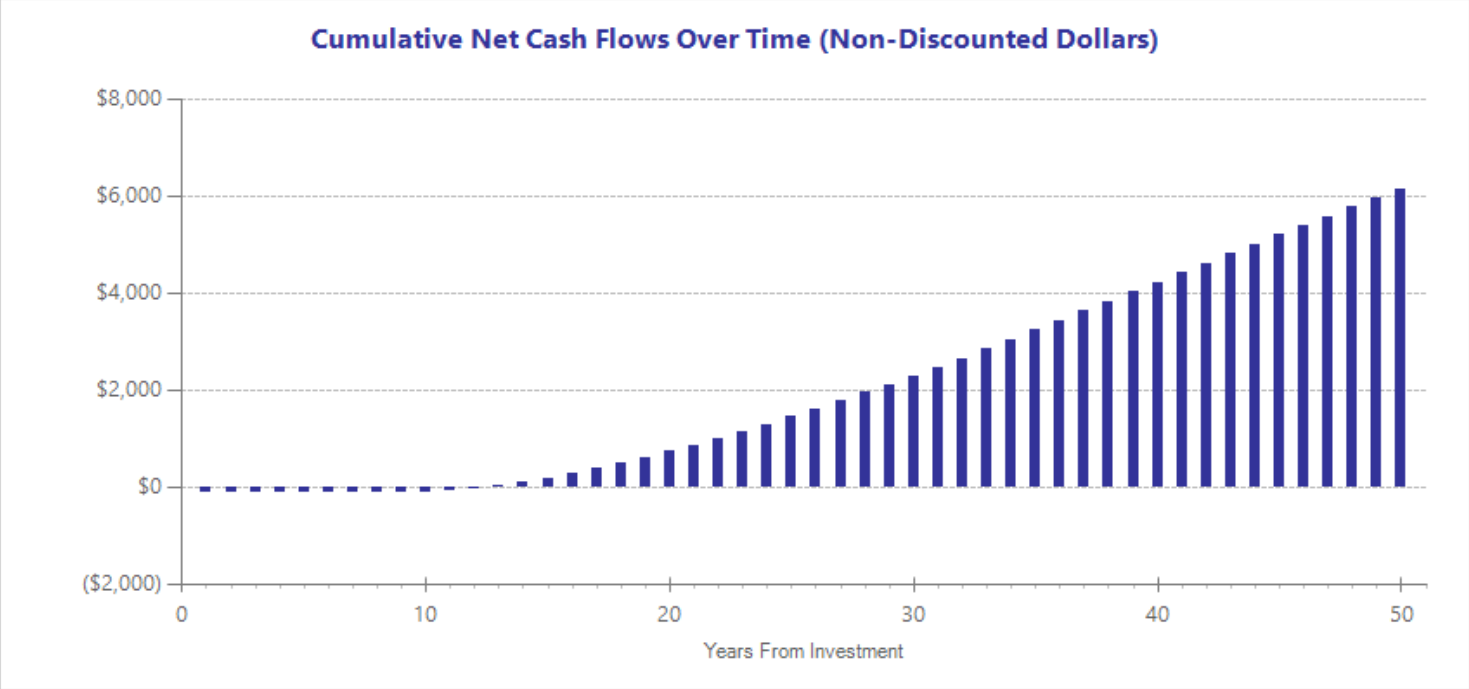
Source of benefits	Benefits to				
	Participants	Taxpayers	Other	Other indirect	Total benefits
From primary participant					
Crime	$0	$1	$3	$1	$4
Labor market earnings (test scores)	$1,219	$520	$601	$0	$2,341
Health care (educational attainment)	($11)	$83	($61)	$41	$52
Adjustment for deadweight cost of program	$0	$0	$0	($37)	($37)
Totals	$1,209	$604	$543	$4	$2,360

Detailed Cost Estimates

	Annual cost	Program duration	Year dollars	Summary statistics	
Program costs	$106	1	2013	Present value of net program costs (in 2013 dollars)	($74)
Comparison costs	$29	1	2009	Uncertainty (+ or - %)	20 %

The cost estimate for the treatment group—those 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 uncertainty range is used in Monte Carlo risk analysis, described in our technical manual.



Meta-Analysis of Program Effects

Outcomes measured	Primary or secondary participant	No. of effect sizes	Unadjusted effect size (random effects model)			Adjusted effect sizes and standard errors used in the benefit-cost analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Test scores	Primary	4	0.027	0.060	0.653	0.027	0.060	10	0.018	0.066	17
High school grad via test scores	Primary	n/a	n/a	n/a	n/a	0.005	0.017	18	0.005	0.017	17

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.

Rockoff, J.E. (2008). *Does mentoring reduce turnover and improve skills of new employees? Evidence from teachers in New York City (Working Paper No. 13868).* Cambridge, MA: National Bureau of Economic Research.

Wechsler, M.E., Caspary, K., Humphrey, D.C., & Matsko, K.K. (2010). *Examining the effects of new teacher induction*. Menlo Park, CA: SRI International.

Teacher professional development: Not targeted

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

Program benefits		Summary statistics	
Participants	$2	Benefit to cost ratio	($0.47)
Taxpayers	$0	Benefits minus costs	($127)
Other	$1	Probability of a positive net present value	34 %
Other indirect	($43)		
Total	($40)		
Costs	($86)		
Benefits minus cost	($127)		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2013). The economic discount rates and other relevant parameters are described in our technical manual.

Detailed Monetary Benefit Estimates

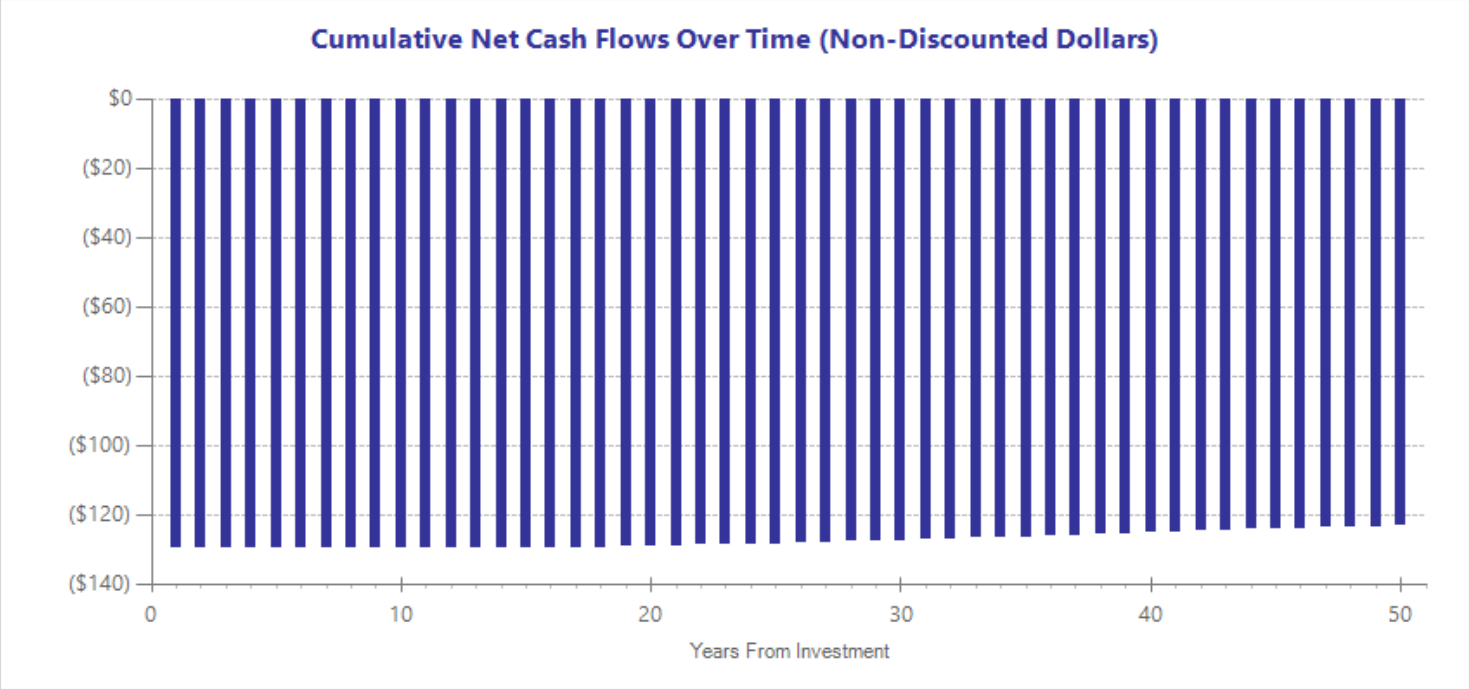
Source of benefits	Benefits to				
	Participants	Taxpayers	Other	Other indirect	Total benefits
From primary participant					
Crime	$0	$0	$0	$0	$0
Labor market earnings (hs grad)	$2	$1	$1	$0	$3
Health care (educational attainment)	$0	$0	$0	$0	$0
Adjustment for deadweight cost of program	$0	$0	$0	($43)	($43)
Totals	$2	$0	$1	($43)	($40)

Detailed Cost Estimates

	Annual cost	Program duration	Year dollars	Summary statistics	
Program costs	$86	1	2013	Present value of net program costs (in 2013 dollars)	($86)
Comparison costs	$0	1	2013	Uncertainty (+ 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 calculate 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 divide compensation costs by the number of students per classroom in Washington's prototypical schools formula and add per-student materials, supplies, and operating 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 uncertainty range is used in Monte Carlo risk analysis, described in our technical manual.



Meta-Analysis of Program Effects

Outcomes measured	Primary or secondary participant	No. of effect sizes	Unadjusted effect size (random effects model)			Adjusted effect sizes and standard errors used in the benefit-cost analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Test scores	Primary	12	0.000	0.005	0.934	0.000	0.005	10	0.000	0.006	17
High school grad via test scores	Primary	n/a	n/a	n/a	n/a	0.000	0.002	18	0.000	0.002	17

Citations Used in the Meta-Analysis

Angrist, J.D., & Lavy, V. (2001). Does teacher training affect pupil learning? Evidence from matched comparisons in Jerusalem public schools. *Journal of Labor Economics, 19*(2), 343-369.

Antoniou, P., & Kyriakides, L. (2013). A Dynamic Integrated Approach to teacher professional development: Impact and sustainability of the effects on improving teacher behaviour and student outcomes. *Teaching and Teacher Education, 29*(1), 1-12.

Cardelle-Elawar, M. (1995). Effects of metacognitive instruction on low achievers in mathematics problems. *Teaching and Teacher Education, 11*(1), 81-95.

Dalton, E.A. (2010). *Relationship between professional development expenditures and student achievement.* (Doctoral dissertation, Tarleton State University, 2010, UMI No. 3428757).

Duffy, G.G., Roehler, L.R., Meloth, M.S., Vavrus, L.G., Book, C., Putnam, J., & Wesselman, R. (1986). The relationship between explicit verbal explanations during reading skill instruction and student awareness and achievement: A study of reading teacher effects. *Reading Research Quarterly, 21*(3), 237-252.

Harris, D.N., & Sass, T.R. (2011). Teacher training, teacher quality and student achievement. *Journal of Public Economics, 95*(7-8), 798-812.

Jacob, B.A., & Lefgren, L. (2004). The impact of teacher training on student achievement: Quasi-experimental evidence from school reform efforts in Chicago. *The Journal of Human Resources, 39*(1), 50-79.

McGill-Franzen, A., Allington, R.L., Yokoi, L., & Brooks, G. (1999). Putting books in the classroom seems necessary but not sufficient. *The Journal of Educational Research, 93*(2), 67-74.

Siegle, D. & McCoach, D. (2007). Increasing student mathematics self-efficacy through teacher training. *The Journal of Secondary Gifted Education, 18*(2), 278-331.

Sloan, H.A. (1993). Direct instruction in fourth and fifth grade classrooms. *Dissertation Abstracts International, 54*(08), 2837A.

Teacher professional development: Online, targeted

Benefit-cost estimates updated July 2014. Literature review updated July 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 areas (such as reading, math, and science) and/or a particular grade level.

Benefit-Cost Summary

Program benefits		Summary statistics	
Participants	$941	Benefit to cost ratio	$5.93
Taxpayers	$471	Benefits minus costs	$1,430
Other	$422	Probability of a positive net present value	57 %
Other indirect	($113)		
Total	$1,721		
Costs	($291)		
Benefits minus cost	$1,430		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2013). The economic discount rates and other relevant parameters are described in our technical manual.

Detailed Monetary Benefit Estimates

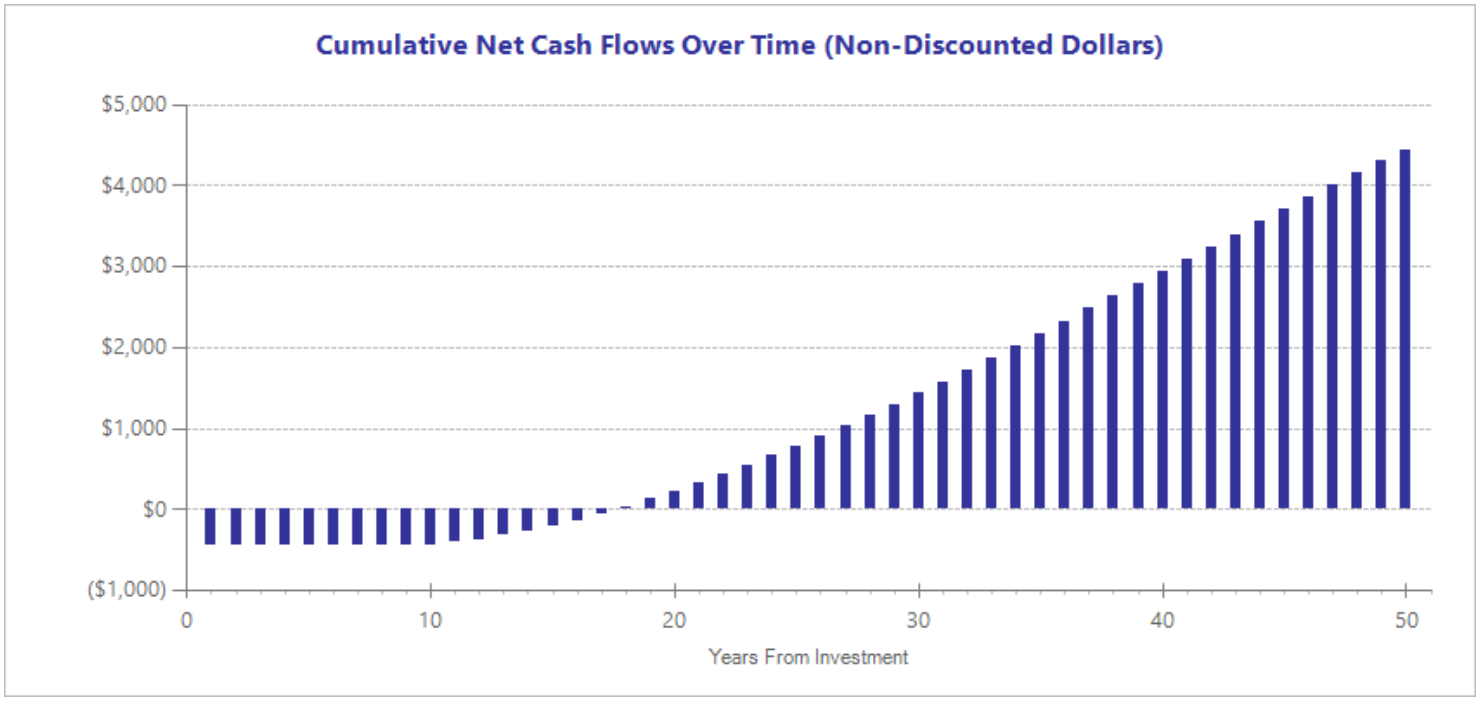
Source of benefits	Benefits to				
	Participants	Taxpayers	Other	Other indirect	Total benefits
From primary participant					
Crime	$0	$1	$2	$0	$3
Labor market earnings (test scores)	$950	$405	$468	$0	$1,822
Health care (educational attainment)	($8)	$65	($48)	$31	$40
Adjustment for deadweight cost of program	$0	$0	$0	($145)	($145)
Totals	$941	$471	$422	($113)	$1,721

Detailed Cost Estimates

	Annual cost	Program duration	Year dollars	Summary statistics	
Program costs	$291	1	2013	Present value of net program costs (in 2013 dollars)	($291)
Comparison costs	$0	1	2013	Uncertainty (+ 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 calculate 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 divide compensation costs by the number of students per classroom in Washington's prototypical schools formula and add per-student materials, supplies, and operating 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 uncertainty range is used in Monte Carlo risk analysis, described in our technical manual.



Meta-Analysis of Program Effects

Outcomes measured	Primary or secondary participant	No. of effect sizes	Unadjusted effect size (random effects model)			Adjusted effect sizes and standard errors used in the benefit-cost analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Test scores	Primary	3	0.164	0.049	0.002	0.021	0.049	10	0.014	0.054	17
High school grad via test scores	Primary	n/a	n/a	n/a	n/a	0.004	0.014	18	0.004	0.014	17

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.

Teacher professional development: Targeted

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

Program benefits	
Participants	$2,676
Taxpayers	$1,347
Other	$1,199
Other indirect	($32)
Total	$5,190
Costs	($260)
Benefits minus cost	$4,930

Summary statistics	
Benefit to cost ratio	$20.02
Benefits minus costs	$4,930
Probability of a positive net present value	84 %

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2013). The economic discount rates and other relevant parameters are described in our technical manual.

Detailed Monetary Benefit Estimates

Source of benefits	Benefits to				
	Participants	Taxpayers	Other	Other indirect	Total benefits
From primary participant					
Crime	$0	$2	$6	$1	$9
Labor market earnings (test scores)	$2,700	$1,152	$1,336	$0	$5,188
Health care (educational attainment)	($25)	$193	($142)	$97	$122
Adjustment for deadweight cost of program	$0	$0	$0	($129)	($129)
Totals	$2,676	$1,347	$1,199	($32)	$5,190

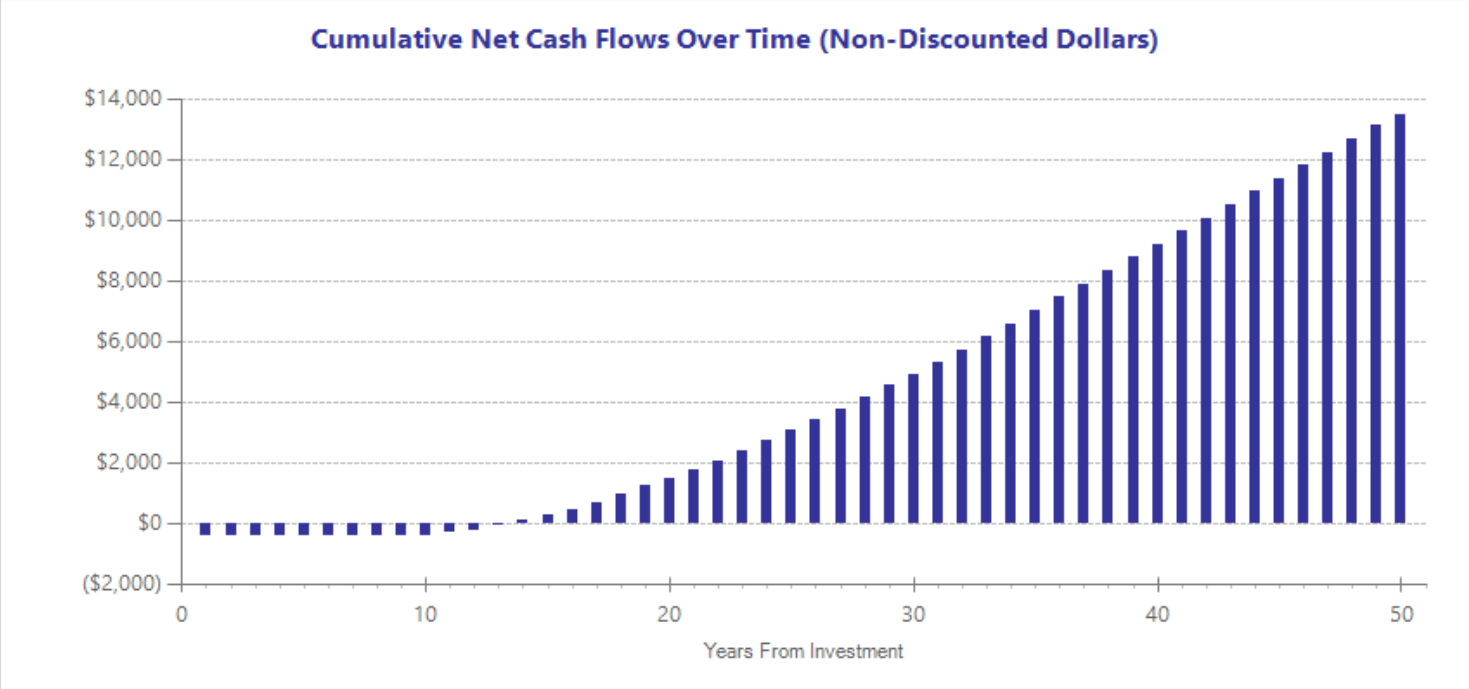
Detailed Cost Estimates

	Annual cost	Program duration	Year dollars
Program costs	$260	1	2013
Comparison costs	$0	1	2013

Summary statistics	
Present value of net program costs (in 2013 dollars)	($260)
Uncertainty (+ 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 calculate 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 divide compensation costs by the number of students per classroom in Washington's prototypical schools formula and add per-student materials, supplies, and operating 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 uncertainty range is used in Monte Carlo risk analysis, described in our technical manual.



Meta-Analysis of Program Effects

Outcomes measured	Primary or secondary participant	No. of effect sizes	Unadjusted effect size (random effects model)			Adjusted effect sizes and standard errors used in the benefit-cost analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Test scores	Primary	14	0.158	0.035	0.002	0.064	0.035	10	0.042	0.039	17
High school grad via test scores	Primary	n/a	n/a	n/a	n/a	0.011	0.010	18	0.011	0.010	17

Citations Used in the Meta-Analysis

Abe, Y., Thomas, V., Sinicrope, C., & Gee, K.A. (2012). *Effects of the Pacific CHILD professional development program.* (NCEE 2013–4002). Washington DC: National Center for Education Evaluation and Regional Assistance.

Borman, K.M., Cotner, B.A., Lee, R.S., Boydston, T.L., & Lanehart, R. (2009). *Improving elementary science instruction and student achievement: The impact of a professional development program.* Paper presented at the Second Annual Conference of the Society for Research on Educational Effectiveness, Crystal City, VA.

Borman, G.D., Gamoran, A., & Bowdon, J. (2008). A randomized trial of teacher development in elementary science: First-year achievement effects. *Journal of Research on Educational Effectiveness, 1*(4), 237-264.

Carpenter, T.P., Fennema, E., Peterson, P.L., Chiang, C.P., & Loef, M. (1989). Using knowledge of children's mathematics thinking in classroom teaching: An experimental study. *American Educational Research Journal, 26*(4), 499-531.

Foster, J.M., Toma, E.F., & Troske, S.P. (2013). Does teacher professional development improve math and science outcomes and is it cost effective? *Journal of Education Finance, 38*(3), 255-275.

Garet, M.S., Cronen, S., Eaton, M., Kurki, A., Ludwig, M., Jones, W., . . . Silverberg, M. (2008). *The impact of two professional development interventions on early reading instruction and achievement.* Washington, DC: National Center for Education Evaluation and Regional Assistance.

Garet, M.S., Wayne, A. J., Stancavage, F., Taylor, J., Walters, K., Song, M., . . . Warner, E. (2010). *Middle school mathematics professional development impact study: Findings after the first year of implementation.* Washington, DC: National Center for Education Evaluation and Regional Assistance.

Heller, J.I., Daehler, K.R., Wong, N., Shinohara, M., & Miratrix, L. W. (2012). Differential effects of three professional development models on teacher knowledge and student achievement in elementary science. *Journal of Research in Science Teaching, 49*(3), 333-362.

Johnson, C.C., Kahle, J.B., & Fargo, J.D. (2007). A study of the effect of sustained, whole-school professional development on student achievement in science. *Journal of Research in Science Teaching, 44*(6), 775-786.

McCutchen, D., Abbott, R.D., Green, L.B., Beretvas, S.N., Cox, S., Potter, N.S., . . . Gray, A.L. (2002). Beginning literacy: Links among teacher knowledge, teacher practice, and student learning. *Journal of Learning Disabilities, 35*(1), 69-86.

Santagata, R., Kersting, N., Givvin, K. B., & Stigler, J.W. (2011). Problem implementation as a lever for change: An experimental study of the effects of a professional development program on students' mathematics learning. *Journal of Research on Educational Effectiveness, 4*(1), 1-24.

Saxe, G., Gearhart, M., & Nasir, N. (2001). Enhancing students' understanding of mathematics: A study of three contrasting approaches to professional support. *Journal of Mathematics Teacher Education, 4*(1), 55-79.

Teacher professional development: Use of data to guide instruction

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

Program benefits		Summary statistics	
Participants	$6,923	Benefit to cost ratio	$128.45
Taxpayers	$3,478	Benefits minus costs	$13,602
Other	$3,112	Probability of a positive net present value	100 %
Other indirect	$196		
Total	$13,709		
Costs	($107)		
Benefits minus cost	$13,602		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2013). The economic discount rates and other relevant parameters are described in our technical manual.

Detailed Monetary Benefit Estimates

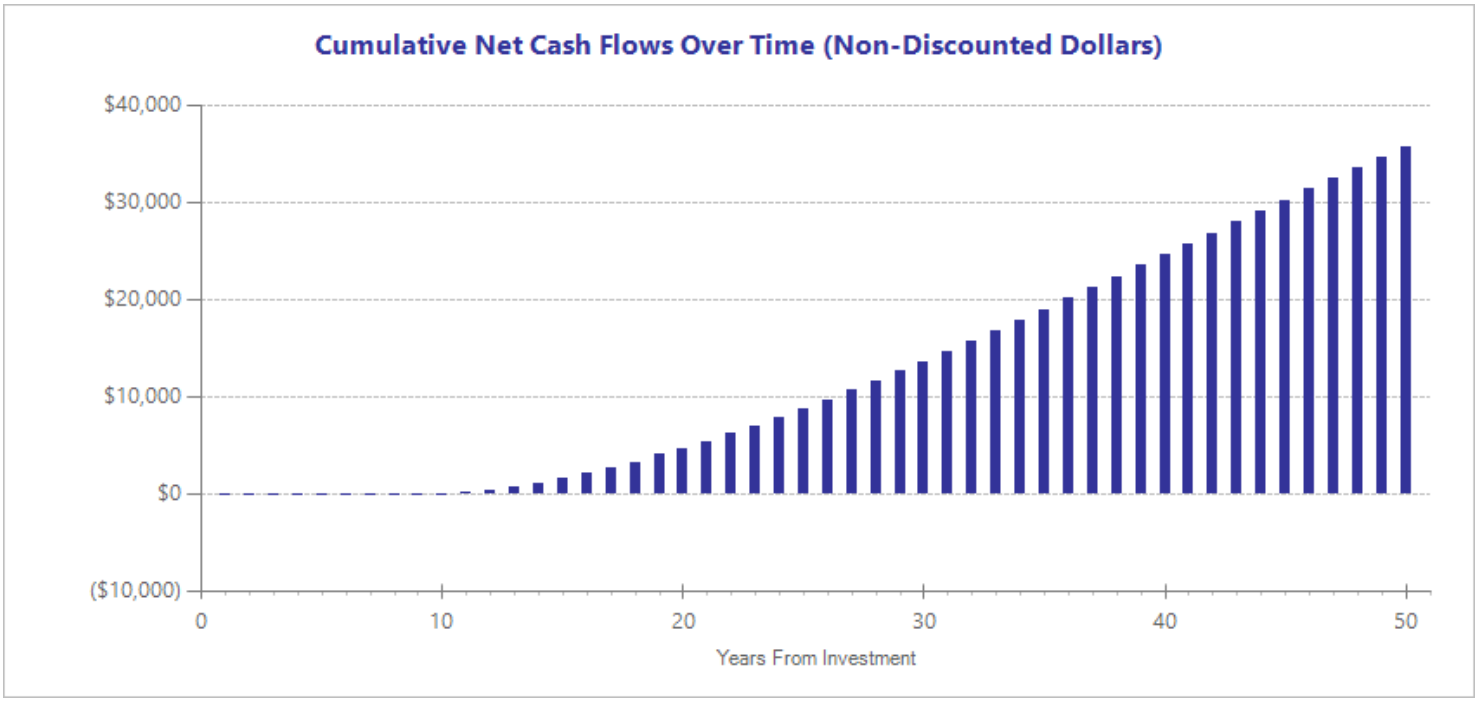
Source of benefits	Benefits to				
	Participants	Taxpayers	Other	Other indirect	Total benefits
From primary participant					
Crime	$0	$6	$15	$3	$23
Labor market earnings (test scores)	$6,985	$2,980	$3,461	$0	$13,426
Health care (educational attainment)	($63)	$493	($364)	$247	$313
Adjustment for deadweight cost of program	$0	$0	$0	($54)	($54)
Totals	$6,923	$3,478	$3,112	$196	$13,709

Detailed Cost Estimates

	Annual cost	Program duration	Year dollars	Summary statistics	
Program costs	$107	1	2013	Present value of net program costs (in 2013 dollars)	($107)
Comparison costs	$0	1	2013	Uncertainty (+ 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 calculate 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 divide compensation costs by the number of students per classroom in Washington's prototypical schools formula and add per-student materials, supplies, and operating 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 uncertainty range is used in Monte Carlo risk analysis, described in our technical manual.



Meta-Analysis of Program Effects

Outcomes measured	Primary or secondary participant	No. of effect sizes	Unadjusted effect size (random effects model)			Adjusted effect sizes and standard errors used in the benefit-cost analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Test scores	Primary	8	0.210	0.030	0.000	0.162	0.030	10	0.107	0.033	17
High school grad via test scores	Primary	n/a	n/a	n/a	n/a	0.028	0.009	18	0.028	0.009	17

Citations Used in the Meta-Analysis

Al Otaiba, S., Connor, C.M., Folsom, J.S., Greulich, L., Meadows, J., & Li, Z. (2011). Assessment data-informed guidance to individualize kindergarten reading instruction: Findings from a cluster-randomized control field trial. *The Elementary School Journal, 111*(4), 535-560.

Connor, C.M., Morrison, F.J., Fishman, B.J., Schatschneider, C., & Underwood, P. (2007). The early years. Algorithm-guided individualized reading instruction. *Science (New York, NY), 315*(5811), 464-5.

Fuchs, L.S., Fuchs, D., Karns, K., Hamlett, C L., & Katzaroff, M. (1999). Mathematics performance assessment in the classroom: Effects on teacher planning and student problem solving. *American Educational Research Journal, 36*(3), 609-646.

Heller, J.I., Daehler, K.R., Wong, N., Shinohara, M., & Miratrix, L.W. (2012). Differential effects of three professional development models on teacher knowledge and student achievement in elementary science. *Journal of Research in Science Teaching, 49*(3), 333-362.

Konstantopoulos, S., Miller, S. R., & van de Ploeg, A. (2013). The impact of Indiana's system of interim assessments on mathematics and reading achievement. *Educational Evaluation and Policy Analysis, 35*(4), 481-499.

Tyler, J. H. (2013). If you build it will they come? Teachers' online use of student performance data. *Education Finance and Policy, 8*(2), 168-207.

Quint, J.C., Sepanik, S., & Smith, J.K. (2008). *Using student data to improve teaching and learning: Findings from an evaluation of the Formative Assessments of Students Thinking in Reading (FAST-R) Program in Boston Elementary Schools.* New York: MDRC.

Slavin, R.E., Cheung, A., Holmes, G.C., Madden, N.A., & Chamberlain, A. (2013). Effects of a data-driven district reform model on state assessment outcomes. *American Educational Research Journal, 50*(2), 371-396.

Tutoring: By adults, one-on-one, non-structured

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

Program benefits		Summary statistics	
Participants	$1,408	Benefit to cost ratio	$1.47
Taxpayers	$710	Benefits minus costs	$669
Other	$629	Probability of a positive net present value	52 %
Other indirect	($654)		
Total	$2,093		
Costs	($1,424)		
Benefits minus cost	$669		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2013). The economic discount rates and other relevant parameters are described in our technical manual.

Detailed Monetary Benefit Estimates

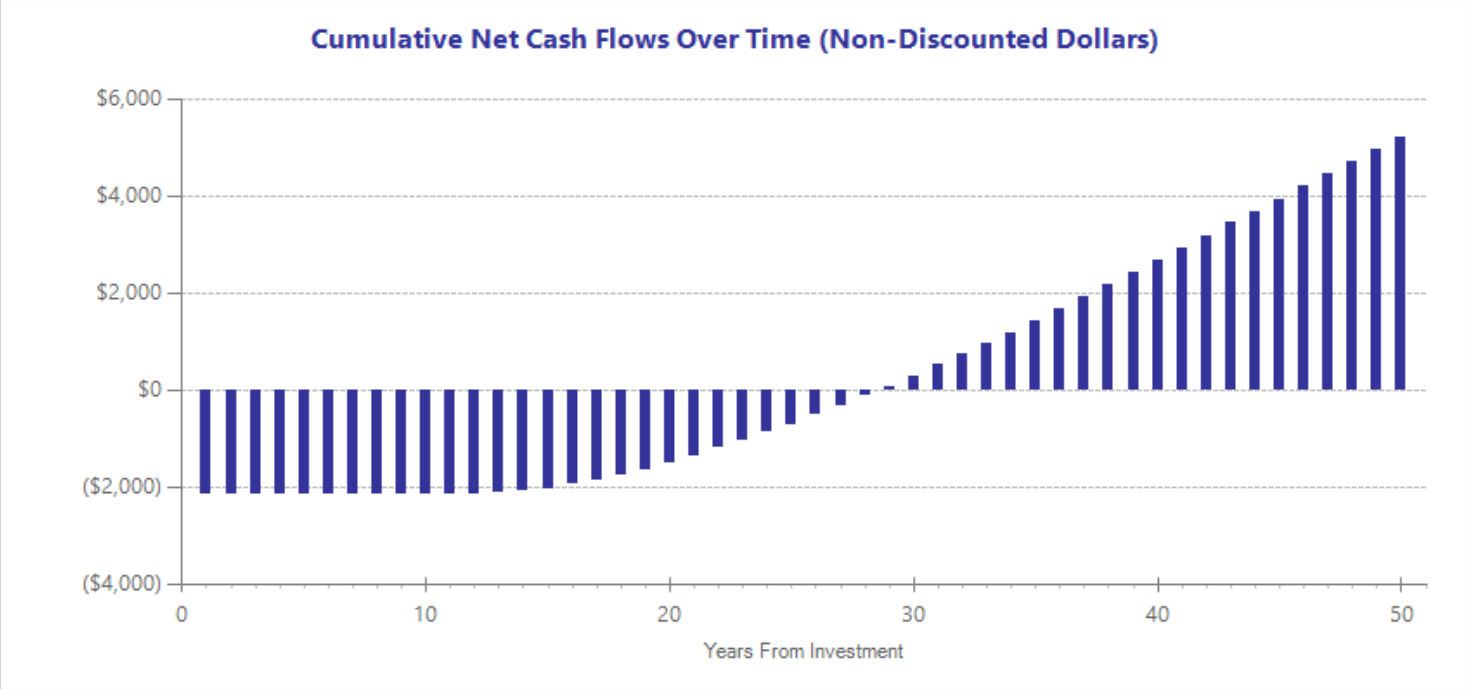
Source of benefits	Benefits to				
	Participants	Taxpayers	Other	Other indirect	Total benefits
From primary participant					
Crime	$0	$1	$3	$1	$5
Labor market earnings (test scores)	$1,422	$606	$702	$0	$2,730
Health care (educational attainment)	($13)	$103	($76)	$51	$65
Adjustment for deadweight cost of program	$0	$0	$0	($706)	($706)
Totals	$1,408	$710	$629	($654)	$2,093

Detailed Cost Estimates

	Annual cost	Program duration	Year dollars	Summary statistics	
Program costs	$1,425	1	2013	Present value of net program costs (in 2013 dollars)	($1,424)
Comparison costs	$0	1	2013	Uncertainty (+ 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 assumes that certificated teachers provide approximately four hours of planning support and oversight. To calculate a per-student annual cost, we use 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 uncertainty range is used in Monte Carlo risk analysis, described in our technical manual.



Meta-Analysis of Program Effects

Outcomes measured	Primary or secondary participant	No. of effect sizes	Unadjusted effect size (random effects model)			Adjusted effect sizes and standard errors used in the benefit-cost analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Test scores	Primary	15	0.052	0.042	0.214	0.050	0.042	7	0.024	0.046	17
High school grad via test scores	Primary	n/a	n/a	n/a	n/a	0.006	0.012	18	0.006	0.012	17

Citations Used in the Meta-Analysis

Baker, S., Gersten, R., & Keating, T. (2000). When less may be more: A 2-year longitudinal evaluation of a volunteer tutoring program requiring minimal training. *Reading Research Quarterly, 35*(4), 494-519.

Cobb, J.B. (2000). The effects of an early intervention program with preservice teachers as tutors on the reading achievement of primary grade at risk children. *Reading Horizons, 41*(3), 155-173.

Cook, J.A. (2001). Every moment counts: Pairing struggling young readers with minimally trained tutors. *Dissertation Abstracts International, 62*(08), 2714A.

McKinney, A.D. (1995). The effects of an after-school tutorial and enrichment program on the academic achievement and self-concept of below grade level first and second grade students. *Dissertation Abstracts International, 56*(06), 2176A.

Rimm-Kaufman, S.E., Kagan, J., & Byers, H. (1999). The effectiveness of adult volunteer tutoring on reading among 'at risk' first grade children. *Reading Research and Instruction, 38*(2), 143-152.

Ritter, G.W. (2000). The academic impact of volunteer tutoring in urban public elementary schools: Results of an experimental design evaluation. *Dissertation Abstracts International, 61*(03), 890A.

Weiss, J.A., Thurlow, M.L., Christenson, S.L., & Ysseldyke, J.E. (1989). *Paired reading with adult volunteer tutors as a reading intervention for students with reading difficulties.* Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco, CA. Retrieved from ERIC database. (ED305606)

Zimmer, R., Hamilton, L., & Christina, R. (2010). After-school tutoring in the context of No Child Left Behind: Effectiveness of two programs in the Pittsburgh Public Schools. *Economics of Education Review, 29*(1), 18-28.

Tutoring: By adults, one-on-one, structured

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

Program Description: The tutoring programs included in this meta-analysis are structured, systematic approaches to tutoring struggling students 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) Reading Recovery, Mathematics Recovery, Edmark Reading Program, Howard Street Tutoring, and Early Intervention Program. The programs 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

Program benefits		Summary statistics	
Participants	$5,665	Benefit to cost ratio	$4.42
Taxpayers	$2,848	Benefits minus costs	$7,813
Other	$2,539	Probability of a positive net present value	89 %
Other indirect	($948)		
Total	$10,104		
Costs	($2,291)		
Benefits minus cost	$7,813		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2013). The economic discount rates and other relevant parameters are described in our technical manual.

Detailed Monetary Benefit Estimates

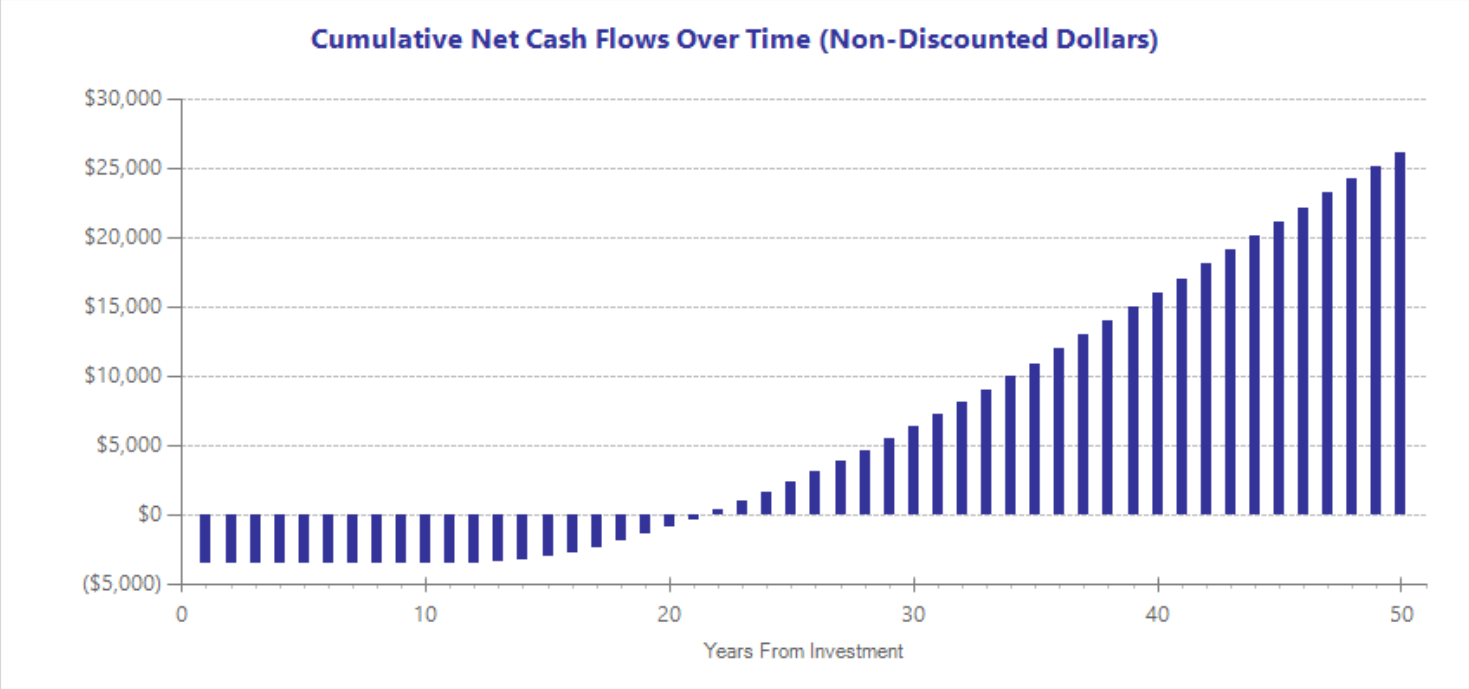
Source of benefits	Benefits to				
	Participants	Taxpayers	Other	Other indirect	Total benefits
From primary participant					
Crime	$0	$5	$12	$2	$19
Labor market earnings (test scores)	$5,717	$2,438	$2,826	$0	$10,981
Health care (educational attainment)	($52)	$405	($299)	$205	$259
Adjustment for deadweight cost of program	$0	$0	$0	($1,155)	($1,155)
Totals	$5,665	$2,848	$2,539	($948)	$10,104

Detailed Cost Estimates

	Annual cost	Program duration	Year dollars	Summary statistics	
Program costs	$2,291	1	2013	Present value of net program costs (in 2013 dollars)	($2,291)
Comparison costs	$0	1	2013	Uncertainty (+ 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 use 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 uncertainty range is used in Monte Carlo risk analysis, described in our technical manual.



Meta-Analysis of Program Effects											
Outcomes measured	Primary or secondary participant	No. of effect sizes	Unadjusted effect size (random effects model)			Adjusted effect sizes and standard errors used in the benefit-cost analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Test scores	Primary	24	0.525	0.045	0.000	0.206	0.045	7	0.097	0.050	17
High school grad via test scores	Primary	n/a	n/a	n/a	n/a	0.026	0.013	18	0.026	0.013	17

Citations Used in the Meta-Analysis

Allor, J., & McCathren, R. (2004). The efficacy of an early literacy tutoring program implemented by college students. *Learning Disabilities Research and Practice, 19*(2), 116-129.

Fuchs, L.S., Geary, D.C., Compton, D.L., Fuchs, D., Schatschneider, C., Hamlett, C. L., DeSelms, J., ... Changas, P. (2013). Effects of first-grade number knowledge tutoring with contrasting forms of practice. *Journal of Educational Psychology, 105*(1), 58-77.

Iversen, S., & Tunmer, W. E. (1993). Phonological processing skills and the Reading Recovery program. *Journal of Educational Psychology, 85*(1), 112-126.

Jacob, R.T., Smith, T.J., Willard, J.A., and & Rifkin, R.E. (2014). *Reading Partners: The implementation and effectiveness of a one-on-one tutoring program delivered by community volunteers* (MDRC Policy Brief). New York: MDRC.

Mantzicopoulos, P., Morrison, D., Stone, E., & Setrakian, W. (1992). Use of the SEARCH/TEACH tutoring approach with middle-class students at risk for reading failure. *Elementary School Journal, 92*(5), 573-586.

Mayfield, L.G. (2000). The effects of structured one-on-one tutoring in sight word recognition of first-grade students at-risk for reading failure. *Dissertation Abstracts International, 61*(02), 481A.

McCarthy, P., Newby, R.F., & Recht, D.R. (1995). Results of an early intervention program for first grade children at risk for reading disability. *Reading Research and Instruction, 34*(4), 273-294.

Morris, D., Shaw, B., & Perney, J. (1990). Helping low readers in grades 2 and 3: An after-school volunteer tutoring program. *Elementary School Journal, 91*(2), 133-150.

Mostow, J., Aist, G., Burkhead, P., Corbett, A., Cuneo, A., Eitelman, S., . . . Tobin, B. (2003). Evaluation of an automated reading tutor that listens: Comparison to human tutoring and classroom instruction. *Journal of Educational Computing Research, 29*(1), 61-117.

Nielson, B.B. (1992). Effects of parent and volunteer tutoring on reading achievement of third grade at-risk students. *Dissertation Abstracts International, 52*(10), 3570A.

Pinnell, G.S., DeFord, D.E., & Lyons, C.A. (1988). *Reading recovery: Early intervention for at-risk first graders.* Arlington, VA: Educational Research Service. (ERIC Document Reproduction Service No. ED 303790)

Pinnell, G.S., Lyons, C.A., DeFord, D.E., Bryk, A.S., & Seltzer, M. (1994). Comparing instructional models for the literacy education of high-risk first graders. *Reading Research Quarterly, 29*(1), 9-39.

Pullen, P.C., Lane, H.B., & Monaghan, M.C. (2004). Effects of a volunteer tutoring model on the early literacy development of struggling first grade students. *Reading Research and Instruction, 43*(4), 21-40.

Rodick, J.D., & Henggeler, S.W. (1980). The short-term and long-term amelioration of academic and motivational deficiencies among low-achieving inner-city adolescents. *Child Development, 51*(4), 1126-1132.

Schwartz, R.M. (2005). Literacy learning of at-risk first-grade students in the reading recovery early intervention. *Journal of Educational Psychology, 97*(2), 257-267.

Smith, T.M., Cobb, P., Farran, D.C., Cordray, D.S., & Munter, C. (2013). Evaluating math recovery: Assessing the causal impact of a diagnostic tutoring program on student achievement. *American Educational Research Journal, 50*(2), 397-428.

Vadasy, P.F., Jenkins, J.R., Antil, L.R., Wayne, S.K., & O'Connor, R.E. (1997). The effectiveness of one-to-one tutoring by community tutors for at-risk beginning readers. *Learning Disability Quarterly, 20*(2), 126-139.

Vadasy, P.F., Jenkins, J.R., & Pool, K. (2000). Effects of tutoring in phonological and early reading skills on students at risk for reading disabilities. *Journal of Learning Disabilities, 33*(6), 579-590.

Vadasy, P.F., Sanders, E.A., & Tudor, S. (2007). Effectiveness of paraeducator-supplemented individual instruction: Beyond basic decoding skills. *Journal of Learning Disabilities, 40*(6), 508-525.

Tutoring: By certificated teachers, small-group, structured

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

Program Description: The small-group tutoring programs included in this analysis are structured, systematic approaches to tutoring struggling students 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

Program benefits		Summary statistics	
Participants	$6,096	Benefit to cost ratio	$8.12
Taxpayers	$3,054	Benefits minus costs	$9,997
Other	$2,739	Probability of a positive net present value	97 %
Other indirect	($486)		
Total	$11,404		
Costs	($1,406)		
Benefits minus cost	$9,997		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2013). The economic discount rates and other relevant parameters are described in our technical manual.

Detailed Monetary Benefit Estimates

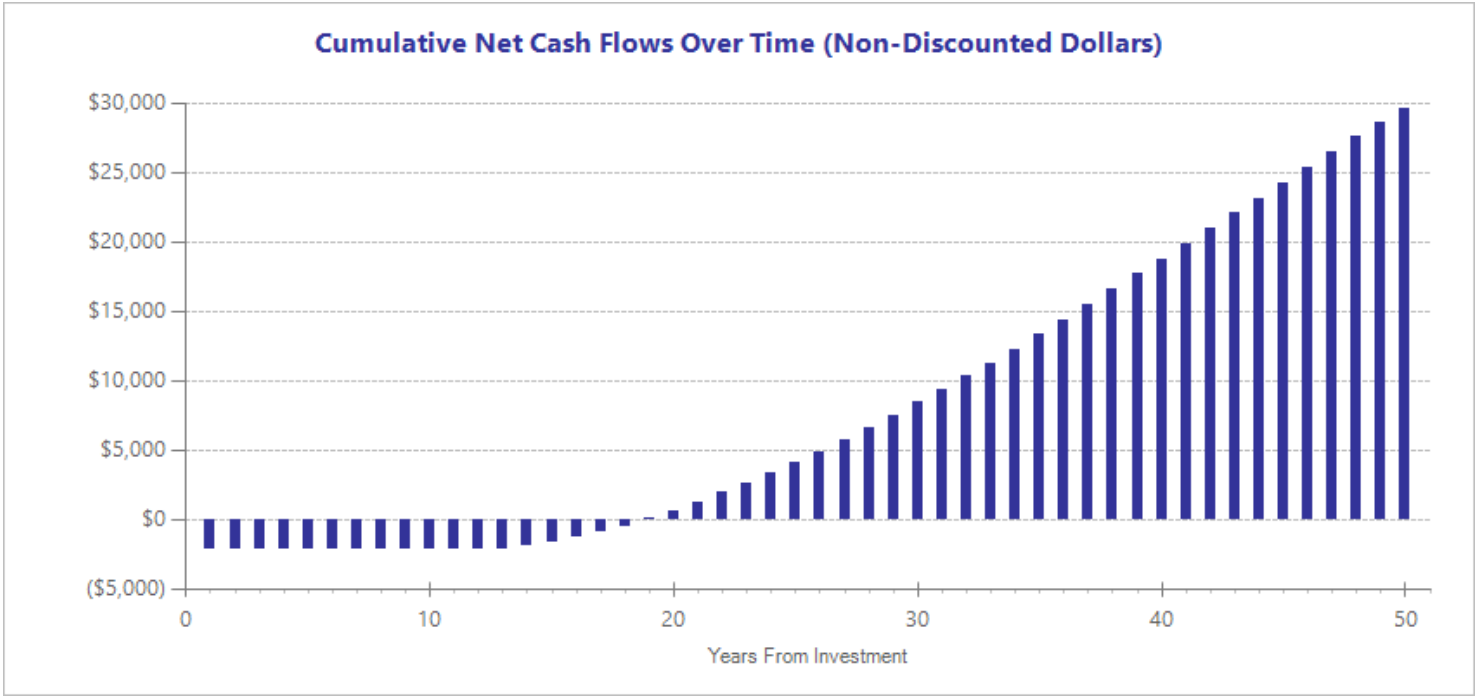
Source of benefits	Benefits to				
	Participants	Taxpayers	Other	Other indirect	Total benefits
From primary participant					
Crime	$0	$5	$13	$2	$20
Labor market earnings (test scores)	$6,151	$2,623	$3,040	$0	$11,814
Health care (educational attainment)	($54)	$426	($314)	$214	$272
Adjustment for deadweight cost of program	$0	$0	$0	($702)	($702)
Totals	$6,096	$3,054	$2,739	($486)	$11,404

Detailed Cost Estimates

	Annual cost	Program duration	Year dollars	Summary statistics	
Program costs	$1,406	1	2013	Present value of net program costs (in 2013 dollars)	($1,406)
Comparison costs	$0	1	2013	Uncertainty (+ 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 use 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 uncertainty range is used in Monte Carlo risk analysis, described in our technical manual.



Meta-Analysis of Program Effects

Outcomes measured	Primary or secondary participant	No. of effect sizes	Unadjusted effect size (random effects model)			Adjusted effect sizes and standard errors used in the benefit-cost analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Test scores	Primary	14	0.265	0.039	0.000	0.220	0.039	7	0.103	0.043	17
High school grad via test scores	Primary	n/a	n/a	n/a	n/a	0.027	0.012	18	0.027	0.012	17

Citations Used in the Meta-Analysis

Fien, H., Santoro, L., Baker, S.K., Park, Y., Chard, D. J., Williams, S., & Haria, P. (2011). Enhancing teacher read alouds with small-group vocabulary instruction for students with low vocabulary in first-grade classrooms. *School Psychology Review, 40*(2), 307-318.

Kerins, M.R., Trotter, D., & Schoenbrodt, L. (2010). Effects of a tier 2 intervention on literacy measures: Lessons learned. *Child Language Teaching and Therapy, 26*(3), 287-302.

Lennon, J.E., & Slesinski, C. (1999). Early intervention in reading: Results of a screening and intervention program for kindergarten students. *School Psychology Review, 28*(3), 353-364.

Mathes, P.G., Denton, C., Anthony, J., Francis, D., & Schatschneider, C. (2005). The effects of theoretically different instruction and student characteristics on the skills of struggling readers. *Reading Research Quarterly, 40*(2), 148-182.

Pinnell, G.S., Lyons, C.A., DeFord, D.E., Bryk, A.S., & Seltzer, M. (1994). Comparing instructional models for the literacy education of high-risk first graders. *Reading Research Quarterly, 29*(1), 9-39.

Ransford-Kaldon, C.R., Flynt, E.S., Ross, C.L., Franceschini, L., Zoblotsky, T., Huang, Y., & Gallagher, B. (2010). *Implementation of effective intervention: An empirical study to evaluate the efficacy of Fountas & Pinnell's Leveled Literacy Intervention* (LLI) *2009-2010*. Memphis, TN: University of Memphis, Center for Research in Education Policy.

Rashotte, C.A., MacPhee, K., & Torgesen, J.K. (2001). The effectiveness of a group reading instruction program with poor readers in multiple grades. *Learning Disability Quarterly, 24*(2), 119-134.

Rolfhus, E., Gersten, R., Clarke, B., Decker, L.E., Wilkins, C., & Dimino, J. (2012). *An Evaluation of Number Rockets: A tier-2 intervention for grade 1 students at risk for difficulties in mathematics* Final Report (NCEE 2012-4007). Washington DC: U.S. Department of Education, Institute for Education Sciences, National Center for Education Evaluation and Regional Assistance.

Torgesen, J.K., Wagner, R.K., Rashotte, C.A., Herron, J., & Lindamood, P. (2010). Computer-assisted instruction to prevent early reading difficulties in students at risk for dyslexia: Outcomes from two instructional approaches. *Annals of Dyslexia, 60*(1), 40-56.

Torgeson, J., Schirm, A., Castner, L., Vartivarian, S., Mansfield, W., Myers, D. ... Haan, C. (2007). National assessment of Title I final report: Volume II: Closing the reading gap: Findings from a randomized trial of four reading interventions for striving readers (NCEE 2008-4013). Washington DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance.

Tutoring: By non-certificated adults, small-group, structured

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

Program Description: The small-group tutoring programs included in this analysis are structured, systematic approaches to tutoring struggling students 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

Program benefits		Summary statistics	
Participants	$3,527	Benefit to cost ratio	$12.60
Taxpayers	$1,770	Benefits minus costs	$6,201
Other	$1,582	Probability of a positive net present value	78 %
Other indirect	($141)		
Total	$6,737		
Costs	($536)		
Benefits minus cost	$6,201		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2013). The economic discount rates and other relevant parameters are described in our technical manual.

Detailed Monetary Benefit Estimates

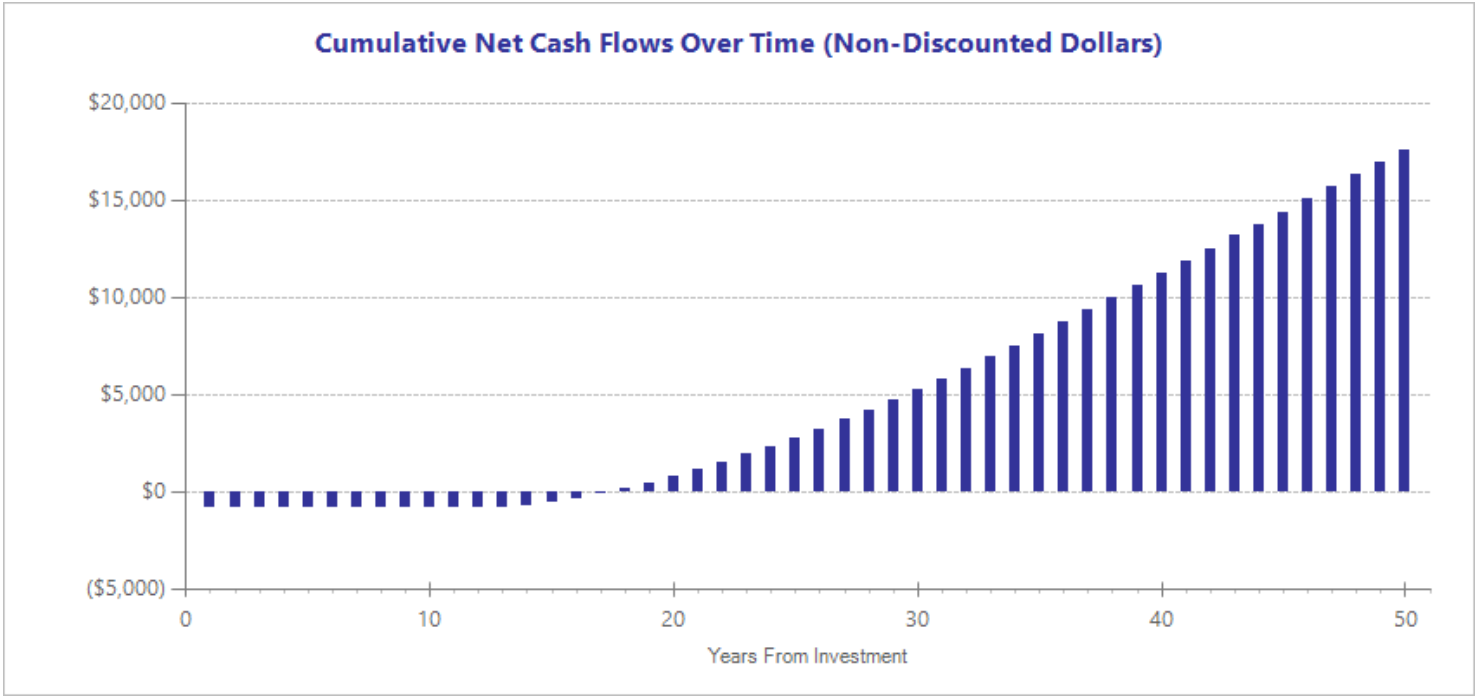
Source of benefits	Benefits to				
	Participants	Taxpayers	Other	Other indirect	Total benefits
From primary participant					
Crime	$0	$3	$8	$1	$12
Labor market earnings (test scores)	$3,559	$1,518	$1,758	$0	$6,835
Health care (educational attainment)	($32)	$249	($184)	$125	$158
Adjustment for deadweight cost of program	$0	$0	$0	($267)	($267)
Totals	$3,527	$1,770	$1,582	($141)	$6,737

Detailed Cost Estimates

	Annual cost	Program duration	Year dollars	Summary statistics	
Program costs	$536	1	2013	Present value of net program costs (in 2013 dollars)	($536)
Comparison costs	$0	1	2013	Uncertainty (+ 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 use 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 uncertainty range is used in Monte Carlo risk analysis, described in our technical manual.



Meta-Analysis of Program Effects

Outcomes measured	Primary or secondary participant	No. of effect sizes	Unadjusted effect size (random effects model)			Adjusted effect sizes and standard errors used in the benefit-cost analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Test scores	Primary	9	0.327	0.064	0.000	0.129	0.064	7	0.061	0.070	17
High school grad via test scores	Primary	n/a	n/a	n/a	n/a	0.016	0.018	18	0.016	0.018	17

Citations Used in the Meta-Analysis

Case, L.P., Speece, D.L., Silverman, R., Ritchey, K.D., Schatschneider, C., Cooper, D.H., Montanaro, E., ... Jacobs, D. (2010). Validation of a supplemental reading intervention for first-grade children. *Journal of Learning Disabilities,* 43, 5.

Fuchs, L.S., Compton, D.L., Fuchs, D., Paulsen, K., Bryant, J.D., & Hamlett, C.L. (2005). The prevention, identification, and cognitive determinants of math difficulty. *Journal of Educational Psychology, 97*(3), 493-513.

Fuchs, L.S., Fuchs, D., Craddock, C., Hollenbeck, K.N., Hamlett, C.L., & Schatschneider, C. (2008). Effects of small-group tutoring with and without validated classroom instruction on at-risk students' math problem solving: Are two tiers of prevention better than one? *Journal of Educational Psychology, 100*(3), 491-509.

Gilbert, J.K., Compton, D.L., Fuchs, D., Fuchs, L.S., Bouton, B., Barquero, L.A., & Cho, E. (2013). Efficacy of a first-grade responsiveness-to-intervention prevention model for struggling readers. *Reading Research Quarterly, 48*(20, 135-154.

Gottshall, D.L. (2007). *Gottshall early reading intervention: A phonics based approach to enhance the achievement of low performing, rural, first grade boys* (Doctoral dissertation). Denton, TX: University of North Texas.

Jordan, N.C., Glutting, J., Dyson, N., Hassinger-Das, B., & Irwin, C. (2012). Building kindergartners' number sense: A randomized controlled study. *Journal of Educational Psychology, 104*(3), 647-660.

Ritchey, K.D., Silverman, R.D., Montanaro, E. A., Speece, D.L., & Schatschneider, C. (2012). Effects of a tier 2 supplemental reading intervention for at-risk fourth-grade students. *Exceptional Children, 78*(3), 318-334.

Vadasy, P.F., & Sanders, E.A. (2008). Repeated reading intervention: Outcomes and interactions with readers' skills and classroom instruction. *Journal of Educational Psychology, 100*(2), 272-290.

Tutoring: By peers, cross-age

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

Program Description: In cross-age peer tutoring, older students are paired with younger, underachieving students to provide one-on-one academic assistance. The evaluated tutoring programs in this analysis provide, on average, 30 hours of peer tutoring time each year and about 7.5 hours of training time for teachers and students to learn program procedures.

Benefit-Cost Summary

Program benefits		Summary statistics	
Participants	$16,565	Benefit to cost ratio	$286.85
Taxpayers	$8,405	Benefits minus costs	$32,806
Other	$7,377	Probability of a positive net present value	83 %
Other indirect	$573		
Total	$32,921		
Costs	($115)		
Benefits minus cost	$32,806		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2013). The economic discount rates and other relevant parameters are described in our technical manual.

Detailed Monetary Benefit Estimates

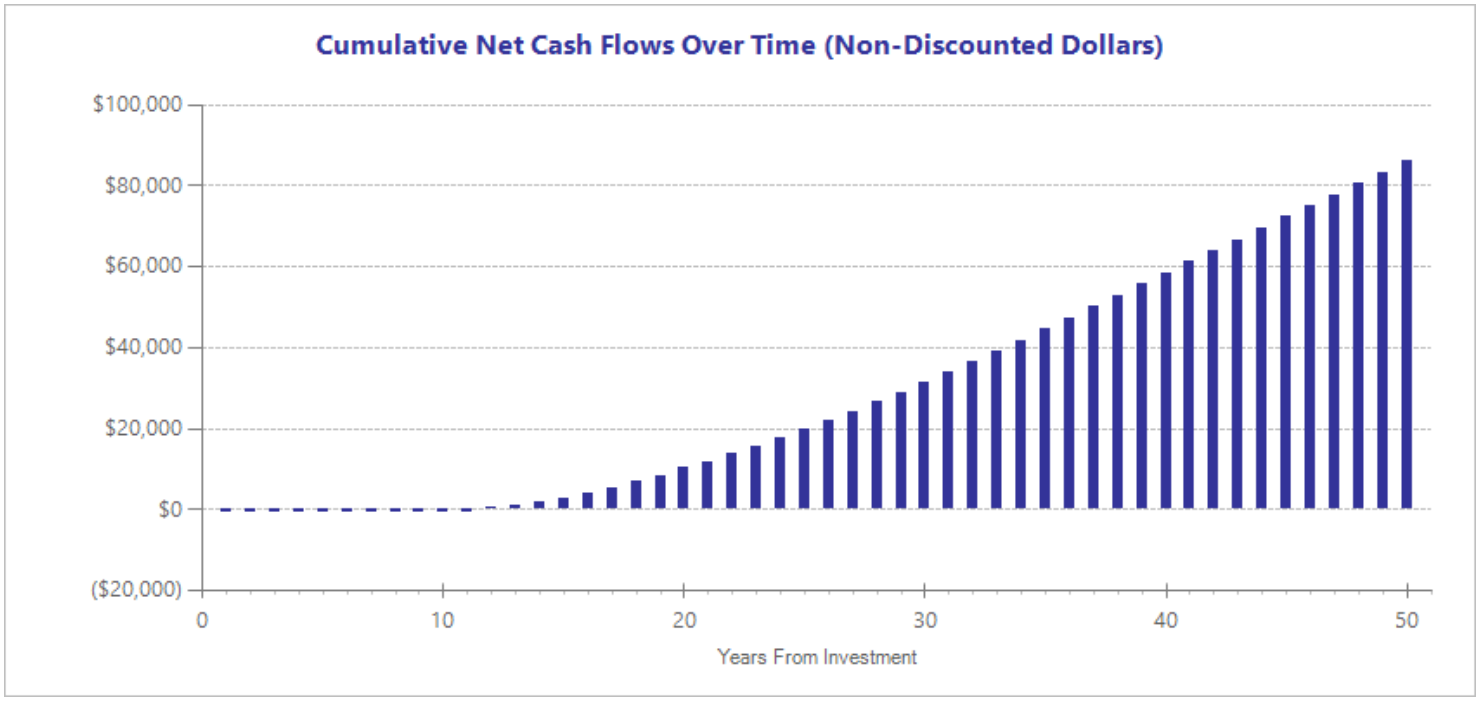
Source of benefits	Benefits to				
	Participants	Taxpayers	Other	Other indirect	Total benefits
From primary participant					
Crime	$0	$14	$39	$7	$60
Labor market earnings (test scores)	$16,725	$7,134	$8,267	$0	$32,126
Health care (educational attainment)	($160)	$1,257	($928)	$623	$792
Adjustment for deadweight cost of program	$0	$0	$0	($57)	($57)
Totals	$16,565	$8,405	$7,377	$573	$32,921

Detailed Cost Estimates

	Annual cost	Program duration	Year dollars	Summary statistics	
Program costs	$115	1	2013	Present value of net program costs (in 2013 dollars)	($115)
Comparison costs	$0	1	2013	Uncertainty (+ or - %)	10 %

In the evaluations included in the meta-analysis, the average cross-age peer tutoring program provides 30 hours tutoring time and 7.5 hours of training time per class. 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, 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 uncertainty range is used in Monte Carlo risk analysis, described in our technical manual.



Meta-Analysis of Program Effects											
Outcomes measured	Primary or secondary participant	No. of effect sizes	Unadjusted effect size (random effects model)			Adjusted effect sizes and standard errors used in the benefit-cost analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Test scores	Primary	2	0.556	0.261	0.025	0.441	0.261	9	0.265	0.287	17
High school grad via test scores	Primary	n/a	n/a	n/a	n/a	0.076	0.080	18	0.076	0.080	17

Citations Used in the Meta-Analysis

Lamport, K.C. (1983). The effects of inverse tutoring on reading disabled students in a public school setting. *Dissertation Abstracts International, 44*(03), 729A.

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.

Tutoring: By peers, same-age and classwide

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

Program Description: In same-age peer tutoring, students from the same classrooms provide academic assistance to struggling peers. Tutoring assistance occurs 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 include (in no particular order): ClassWide Peer Tutoring, Peer-Assisted Learning Strategies, and Reciprocal Peer Tutoring. The evaluated programs provide, on average, 30 hours of peer tutoring time each year and about five hours of training time for teachers and students to learn program procedures.

Benefit-Cost Summary

Program benefits		Summary statistics	
Participants	$5,678	Benefit to cost ratio	$104.33
Taxpayers	$2,874	Benefits minus costs	$11,140
Other	$2,538	Probability of a positive net present value	76 %
Other indirect	$159		
Total	$11,248		
Costs	($108)		
Benefits minus cost	$11,140		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2013). The economic discount rates and other relevant parameters are described in our technical manual.

Detailed Monetary Benefit Estimates

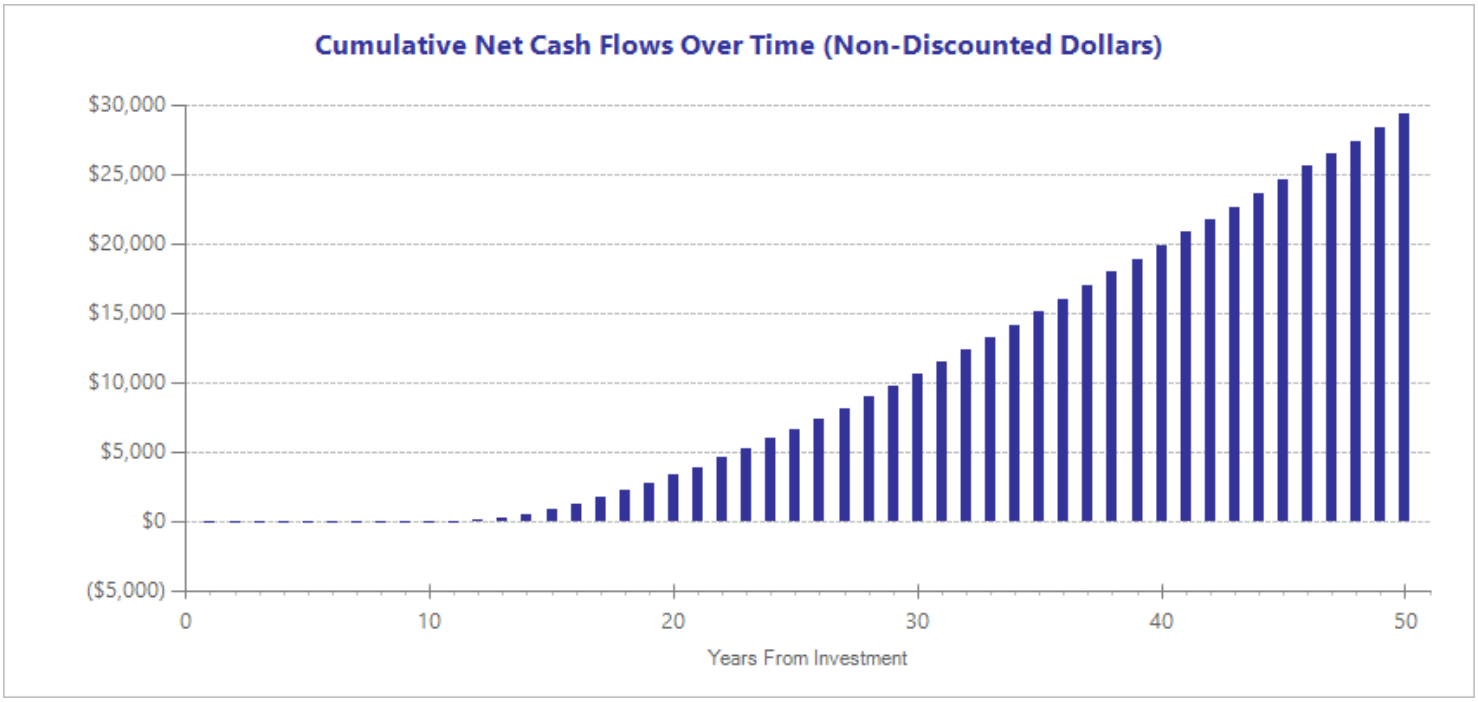
Source of benefits	Benefits to				
	Participants	Taxpayers	Other	Other indirect	Total benefits
From primary participant					
Crime	$0	$5	$13	$2	$20
Labor market earnings (test scores)	$5,732	$2,445	$2,838	$0	$11,014
Health care (educational attainment)	($54)	$424	($313)	$211	$268
Adjustment for deadweight cost of program	$0	$0	$0	($54)	($54)
Totals	$5,678	$2,874	$2,538	$159	$11,248

Detailed Cost Estimates

	Annual cost	Program duration	Year dollars	Summary statistics	
Program costs	$108	1	2013	Present value of net program costs (in 2013 dollars)	($108)
Comparison costs	$0	1	2013	Uncertainty (+ or - %)	10 %

In the evaluations included in this meta-analysis, the average same-age peer tutoring program provides 30 hours tutoring time and five hours of training time per class. 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 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 uncertainty range is used in Monte Carlo risk analysis, described in our technical manual.



Meta-Analysis of Program Effects

Outcomes measured	Primary or secondary participant	No. of effect sizes	Unadjusted effect size (random effects model)			Adjusted effect sizes and standard errors used in the benefit-cost analysis					
						First time ES is estimated			Second time ES is estimated		
			ES	SE	p-value	ES	SE	Age	ES	SE	Age
Test scores	Primary	7	0.395	0.120	0.001	0.154	0.120	9	0.092	0.132	17
High school grad via test scores	Primary	n/a	n/a	n/a	n/a	0.025	0.035	18	0.025	0.035	17

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.

Greenwood, C. R., & Terry, B. (1993). Achievement, placement, and services: Middle school benefits of classwide peer tutoring used at the elementary school. *School Psychology Review, 22*(3), 497-516.

Heller, L.R., & Fantuzzo, J.W. (1993). Reciprocal peer tutoring and parent partnership: Does parent involvement make a difference? *School Psychology Review, 22*(3), 517-534.

Mathes, P.G., & Fuchs, L.S. (1993). Peer-mediated reading instruction in special education resource rooms. *Learning Disabilities Research and Practice, 8*(4), 233-243.

Future Updates

The legislature directed WSIPP to update this inventory every two years, with the first update due August 1, 2016. WSIPP will produce an additional update by July 1, 2015 to align with OSPI's ongoing work on a menu of best practices for use in the Learning Assistance Program.

WSIPP's initial report and inventory of evidence- and research-based practices can be found on the WSIPP website.

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