

## Text message interventions for parents to support early learning for students in preschool Pre-K to 12 Education

Benefit-cost estimates updated December 2023. Literature review updated November 2020.

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

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

**Program Description:** Text message interventions aim to support early learning by sending regular messages to parents of preschoolers. The text message interventions included in this analysis focus on a set of skills and/or parenting practices. Parents receive a "fact" text explaining the importance of the skill or practice, a "tip" text that teaches efficient ways to engage with children, and a "growth" text that encourages continued practice. Among studies included in this analysis, parents received three texts per week for eight months to encourage behavior that supports their children's early literacy and math development.

### Benefit-Cost Summary Statistics Per Participant

Benefits to:

Taxpayers	\$301	Benefit to cost ratio	\$167.70
Participants	\$708	Benefits minus costs	\$1,369
Others	\$373	Chance the program will produce	
Indirect	(\$4)	benefits greater than the costs	53%
<b>Total benefits</b>	<b>\$1,378</b>		
<b>Net program cost</b>	<b>(\$8)</b>		
<b>Benefits minus cost</b>	<b>\$1,369</b>		

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2022). The chance the benefits exceed the costs are derived from a Monte Carlo risk analysis. The details on this, as well as the economic discount rates and other relevant parameters are described in our [Technical Documentation](#).

### Meta-Analysis of Program Effects

Outcomes measured	Treatment age	No. of effect sizes	Treatment N	Adjusted effect sizes and standard errors used in the benefit-cost analysis						Unadjusted effect size (random effects model)	
				First time ES is estimated			Second time ES is estimated				
				ES	SE	Age	ES	SE	Age	ES	p-value
Test scores	4	2	427	0.033	0.068	4	0.007	0.075	17	0.076	0.266

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

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

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

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

### Detailed Monetary Benefit Estimates Per Participant

Affected outcome:	Resulting benefits: <sup>1</sup>	Benefits accrue to:				
Test scores	Labor market earnings associated with test scores	Taxpayers \$301	Participants \$708	Others <sup>2</sup> \$373	Indirect <sup>3</sup> \$0	Total \$1,382
Program cost	Adjustment for deadweight cost of program	\$0	\$0	\$0	(\$4)	(\$4)
Totals		\$301	\$708	\$373	(\$4)	\$1,378

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

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

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

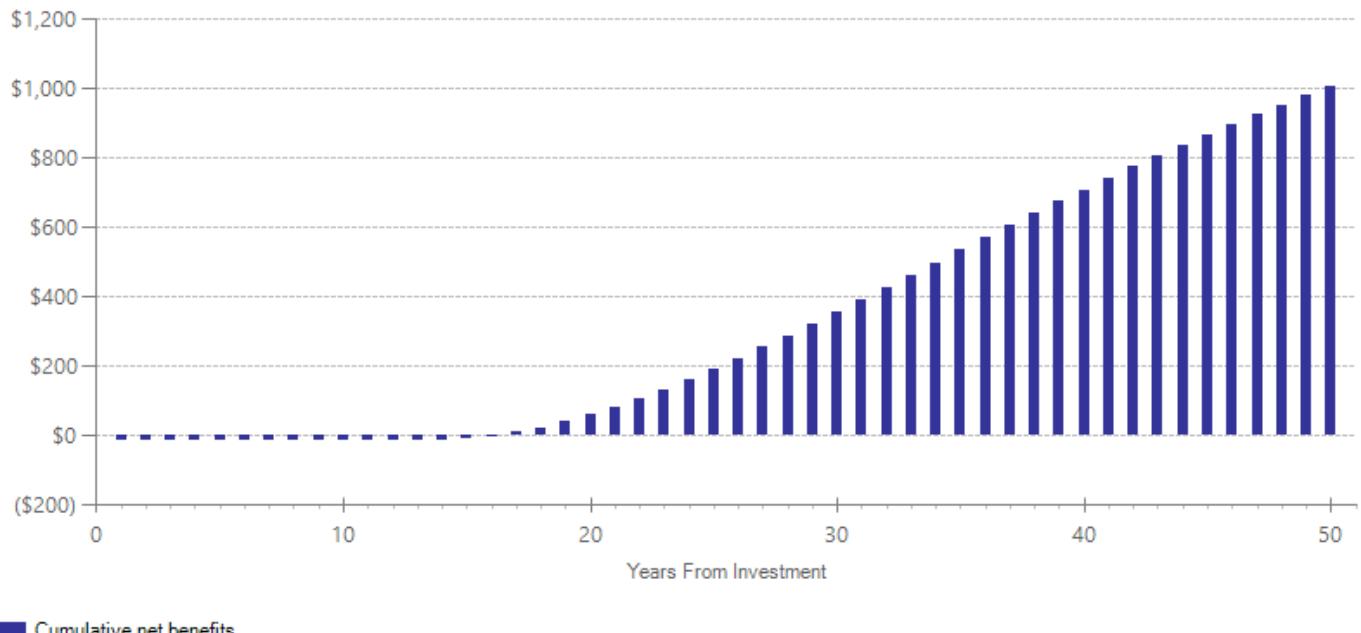
### Detailed Annual Cost Estimates Per Participant

	Annual cost	Year dollars	Summary	
Program costs	\$7	2019	Present value of net program costs (in 2022 dollars)	(\$8)
Comparison costs	\$0	2019	Cost range (+ or -)	60%

Cost estimates vary across studies and may include training, software used to automate text delivery, and staffing time to compose message content. We estimate an average per-participant cost based on the following sources: York et al. (2019); Kraft, M.A., & Rogers, T. (2015). The underutilized potential of teacher-to-parent communication: Evidence from a field experiment. *Economics of Education Review*, 47, 49-63; and Bergman, L.S., & Chan, E.W. (2017). Leveraging technology to engage parents at scale: Evidence from a randomized controlled trial. CESifo Working Paper, No. 6493. Center for Economic Studies Institute.

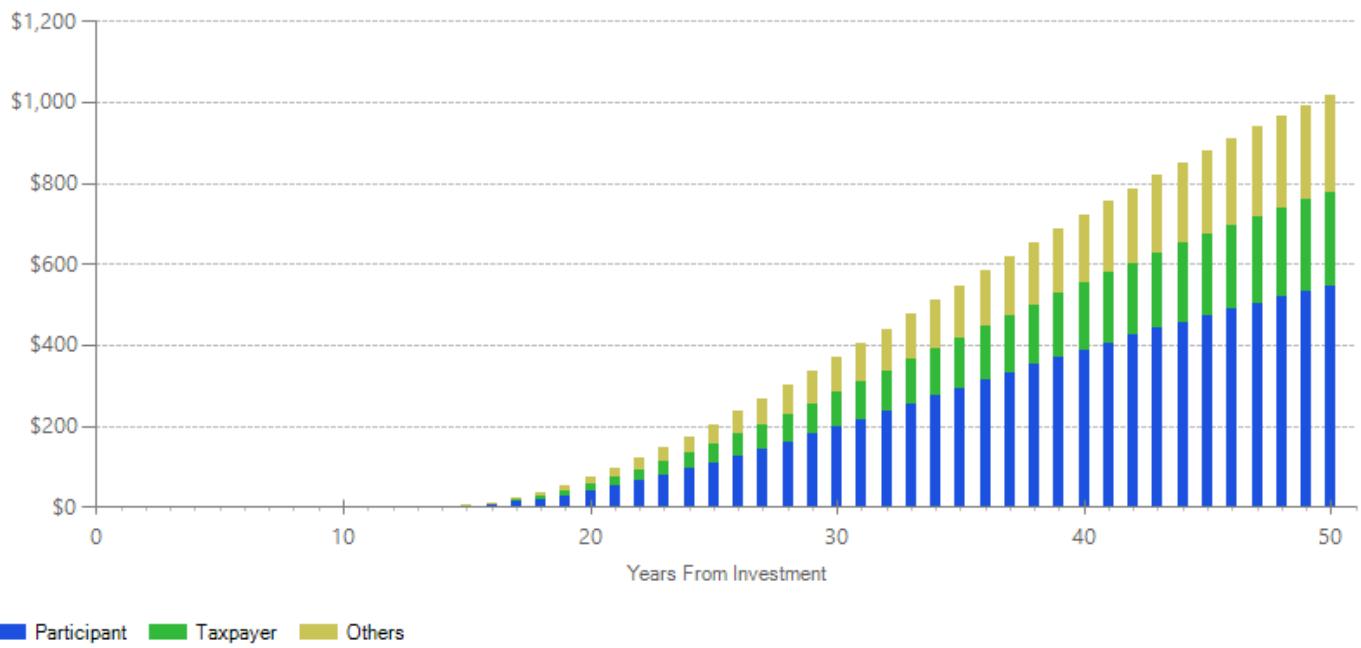
The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta-analysis. The cost range reported above reflects potential variation or uncertainty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

## Benefits Minus Costs Over Time (Cumulative Discounted Dollars)

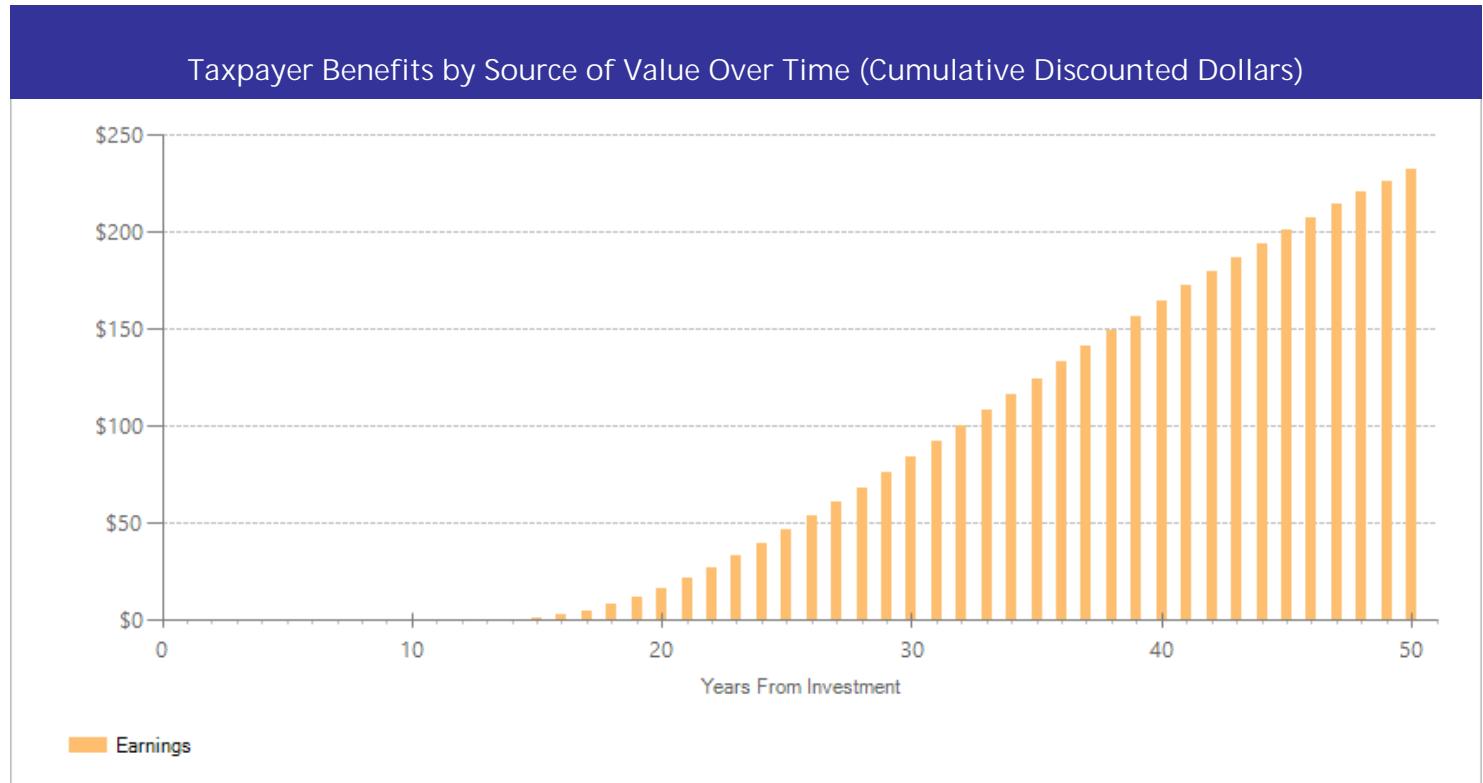


The graph above illustrates the estimated cumulative net benefits per-participant for the first fifty years beyond the initial investment in the program. We present these cash flows in discounted dollars. If the dollars are negative (bars below \$0 line), the cumulative benefits do not outweigh the cost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

## Benefits by Perspective Over Time (Cumulative Discounted Dollars)



The graph above illustrates the breakdown of the estimated cumulative benefits (not including program costs) per-participant for the first fifty years beyond the initial investment in the program. These cash flows provide a breakdown of the classification of dollars over time into four perspectives: taxpayer, participant, others, and indirect. "Taxpayers" includes expected savings to government and expected increases in tax revenue. "Participants" includes expected increases in earnings and expenditures for items such as health care and college tuition. "Others" includes benefits to people other than taxpayers and participants. Depending on the program, it could include reductions in crime victimization, the economic benefits from a more educated workforce, and the benefits from employer-paid health insurance. "Indirect benefits" includes estimates of the changes in the value of a statistical life and changes in the deadweight costs of taxation. If a section of the bar is below the \$0 line, the program is creating a negative benefit, meaning a loss of value from that perspective.



The graph above focuses on the subset of estimated cumulative benefits that accrue to taxpayers. The cash flows are divided into the source of the value.

## Citations Used in the Meta-Analysis

Doss, C.J., Fricke, H., & Loeb, S. (2020). Math is for girls: The unequal effects of text messaging to help parents support early math development. *EdWorkingPaper: 20-310*.

York, B.N., Loeb, S., & Doss, C. (2019). One step at a time: The effects of an early literacy text-messaging program for parents of preschoolers. *Journal of Human Resources*, 54(3), 537-566.

