

Calculating the Cost of Reading Failure

Reading by third grade is a critical milestone in a child's educational career because it is the point at which schooling changes from "learning to read" to "reading to learn." Children who have not mastered reading by this point have about a 70 percent chance of either dropping out of school or graduating unprepared for college or career entry. In the longer term, they will be far less likely to earn a family-sustaining wage and far more likely to become heavy users of public services such as health care, public safety, and welfare.

Building on studies reported by ACT, The Annie E. Casey Foundation, and The Teachers College Campaign for Education Equity, the Education Consumers Foundation has developed an online calculator that permits users to estimate the added public expenditures that result from students not learning to read. The projections are adjusted for state and local differences in cost of living and based on the number of third grade students who are *below proficient* in reading.¹

The Casey Foundation's [Double Jeopardy](#) report allows prediction of drop-outs from 3rd grade reading skills and [ACT's report](#) enables prediction of preparedness for college or career from 4th grade reading skills. Given those projections, the [Teachers College report](#) is then used to estimate the extraordinary government expenditures made on behalf of dropouts and unprepared graduates over their working lifetimes.

ECF's calculator is a first attempt to project the fiscal consequences of unsuccessful reading instruction at the school, district, and state level. There is a substantial foundation of economic and educational literature pertaining to the cost of educational failure, but few studies that tie these costs to the tens of thousands of individual schools and districts that are responsible for teaching children to read.

Substantial tax savings are attainable

Inevitably, the precision of these estimates is constrained by the limitations inherent in the foundational studies and the lack of settled findings regarding the linkages between test scores, preparedness for college or a career, and economic and workforce outcomes. Nonetheless, even back-of-the-envelope estimates are a useful reminder of a vital but rarely discussed consequence of ineffective schooling: The hidden tax burden it imposes at the local, state, and federal levels. It is an issue that can and should be addressed by local citizens through their directly elected local officials. Cost-effective improvement is attainable in virtually every community and urgently needed in most.

1 Although terminology can differ, most states distinguish four levels of reading performance using the terms *advanced*, *proficient*, *basic*, and *below-basic*. The *advanced* and *proficient* levels are at or above grade level and collectively referred to as *proficient*. The *basic* and *below-basic* levels are below grade level and collectively referred to as *below-proficient*. For states that distinguish fewer than 4 levels of reading proficiency, the calculator divides their *below-proficient* percentages on the basis of the percentages reported in 2013 by the National Assessment of Educational Progress (NAEP).

The enrollment and student proficiency data for schools, districts, and states are drawn from each state's online education report card. The local cost-of-living adjustments are based on data from the [Council for Community and Economic Research](#).

The calculator's cost estimates are based on a detailed study of education's social and economic returns by [Teachers College, Columbia University](#), and indirectly buttressed by the wide-ranging literature on which its authors relied. The calculator focuses on only one aspect of its findings--the excess cost-of-living-adjusted public services consumed by dropouts and unprepared graduates.² In order to ensure that its estimates are relatively conservative, it does not address the vastly larger losses of personal earnings, tax receipts, and economic productivity that are known to result.³

The calculator combines local reading proficiency, student enrollment, and cost of living data with student achievement projections and spending estimates, all drawn from published reports. It is intended to provide an empirically grounded estimate of the hidden taxpayer burden that results from unsuccessful schooling.

Students who do not learn to read, do not succeed in school—and neither do they disappear after they graduate. In reality, they live educationally disabled lives, working in low paying occupations in the midst of every American community. They have little chance at prosperity or escape from the social safety net, and they absorb public funds well in excess of those required by their successfully educated peers. It is important that Americans recognize that a very large segment of the dependent and chronically unemployed of today's workforce were once fresh-faced children sitting in kindergarten and looking forward to a happy and prosperous future.

Bottom Line: Success in early reading instruction may be schooling's most important goal because reading failure is prohibitively expensive to both the individual and society. Reading failure annually generates what amounts to a hidden surtax on the adult population--one that cumulates with each graduating class. The dollar amounts are shocking.

An Example: The Destiny of 100 Third Graders Who Have Not Yet Mastered Reading

The Casey Foundation study found that 16% of 3rd grade students who are *below-proficient* (i.e., who read at the *basic* or *below-basic* levels) will eventually drop out. An unrelated study of 4th graders by ACT found that only 37% of *basic* readers (i.e., non-dropouts identified as "Off Track") and 9% of *below-basic* (i.e., non-dropouts identified as Far Off Track) reach the ACT's 8th grade college and career readiness benchmarks, and that less than one in three would ultimately be ready for college or a career. The Teachers College study compiled the lifetime present values of the costs to taxpayers occasioned by high school dropouts and unprepared graduates.

2 The estimates produced by the calculator are the difference between the cost of public services used by dropouts and high school completers versus the cost of services used by students who complete some college, but not a bachelor's degree. Moreover, they reflect only the numbers of dropouts and unprepared students predictable from reading skill deficiencies, not the larger numbers attributable to the broad array of factors that affect the preparedness of high school graduates.

3 There is a growing body of research that examines the broad fiscal and social costs that stem from the growth of the "Opportunity Youth" population i.e., the 6.7 million marginally employable 16-24 year olds who have exited the public schools in recent years. The findings produced the [Center for Benefit-Cost Studies of Education](#) at Teachers College (Levin, Belfield, et al.) and the recent [Endangering Prosperity](#) by Hanushek, Peterson, and Woessmann both point to the conclusion that continued educational failure and the resulting growth of this population are well on their way to creating economic and social catastrophe for the U.S.

The ECF calculator puts the findings of these studies together with local and state school performance data to produce a cost-of-living-adjusted estimate of the local, state, and federal tax burden predictable from the lack of reading mastery at 3rd grade.⁴

The following is an illustration of how the calculator would predict the high school outcomes and fiscal impact of 100 students who *enter and exit* the 4th grade with below-proficient reading scores as assessed by NAEP standards (i.e., scores at the *basic* or *below-basic* levels).

Because many states report reading proficiency rates that are double those reported by the NAEP, the count of *below-proficient* students for states other than Arizona, Louisiana, Massachusetts, and Florida should be considered [underestimates](#). In coming years, however, these gaps may be expected to narrow as states report scores based on the more rigorous Common Core standards.

Estimating the number of dropouts

The Casey Foundation's 2011 [Double Jeopardy](#) report estimates school dropouts from third grade reading scores. It also provides more refined estimates of dropouts based on poverty and ethnic membership data. The following calculations, however, are founded only on the predictions of dropouts that can be made from knowledge of *basic* and *below-basic* levels of reading performance for all students.

From Appendix II, page 13 of *Double Jeopardy*:

- Dropout rate predicted for 3rd grade students reading at the *basic* level = 9%
- Dropout rate predicted for 3rd grade students reading at the *below-basic* level = 23%

Applying these percentages to 100 third graders, 50 at the *basic* level and 50 at the *below basic* level, the calculator predicts:

- 4 of the *basic* level readers (9% x 50 students = 4) will eventually drop out, leaving 46 on path to grade 8
- 12 of the *below-basic* readers (23% x 50 students = 12) will eventually drop out, leaving 38 on path to grade 8

Summary: Of the 100 *below-proficient readers*, 4+12 = 16 will eventually drop out and the remaining 84 *below-proficient* students will remain on path to grade 8.

- 46 *basic* level readers
- 38 *below-basic* level readers

Estimating the number of college and career-ready high school graduates

ACT's 2012 [Catching up to College and Career Readiness](#) provides an estimate of college and career readiness from an analysis of grade 4, 8, and 12 reading and math data obtained from multiple cohorts of students. Dropouts were not included. College and career readiness at grade 12 was predicted from scores obtained at grade 4 and at grade 8. Results were disaggregated by ethnic group; however, the present calculations pertain only to the percentage of college and career-ready students that can be predicted from reading mastery.

⁴ Refinements in the calculator will be forthcoming as linkages between K-3 reading skills and postsecondary outcomes become more fully articulated in the scholarly literature.

The [original ACT Report](#) on which the *Catching up* briefing is based describes the *Off Track* and *Far Off Track* reading levels used by ACT as “roughly” representing the same segment of the score distribution as the *basic* and *below-basic* levels of reading proficiency used by the National Assessment of Educational Progress (NAEP; see footnote 5, page 7 of the Research Report). Although the terms have not been empirically shown to be equivalents, they are treated as such by the calculator. ACT’s reading benchmark is only one of four indicators used by ACT to determine student need for remedial coursework and likelihood of success in college. In the following analysis, however, ACT’s reading benchmark is also treated as the functional equivalent of the college-level reading proficiency [breakpoint](#) used by the National Assessment of Educational Progress—one of the two key indicators that will, in coming years, define college readiness—according to recent [reports](#) by the National Assessment Governing Board.

Bottom line: Reading proficiency at grade 12 is becoming increasingly relied on as indispensable to any assessment of college and career readiness.⁵ Postsecondary education and work of almost any description require reading skills adequate to keep up with changing job needs.

Estimating the attainment of 8th grade College Readiness Benchmarks from 4th grade reading scores

The following percentages are drawn from Figure 6, page 6 of the *Catching up* briefing:

- 37% of *Off Track* (i.e., *basic* level) 4th grade readers will attain the 8th grade College Readiness Benchmark
- 9% of *Far Off Track* (i.e., *below-basic* level) 4th grade readers will attain the 8th grade College Readiness Benchmark

Applying the above percentages to the non-dropouts on path to grade 8 yields the following outcomes:

- 17 of the 46 *Off Track* 4th graders will reach the 8th grade College Readiness Benchmark (37% x 46 *basic*-level non-dropouts = 17)
- 3 of the *Far Off Track* 4th graders will reach the 8th grade College Readiness Benchmark (9% x 38 *below-basic* level non-dropouts = 3)

In summary, a total of 20 (17 + 3) of the 84 non-dropout 4th graders will attain ACT’s 8th grade College Readiness Benchmark and 64 fall short (i.e., will remain *Off Track* or *Far Off Track* at grade 8).

From 4th grade projections to 8th grade outcomes

The following calculations treat *On Track*, *Off Track*, and *Far Off Track* results predicted from grade 4 data as though the 84 non-dropouts were tested again at grade 8. Inevitably, this procedure disregards the various types of error that long term statistical predictions entail.

The *Catching up* briefing (Figure 6, page 6) predicts the number of 4th graders who would attain the 8th grade College Readiness Benchmarks but it does not specify the level of reading performance attained by the 64 below-proficient students who fall short. Therefore, it is necessary for the calculator to create an estimate of the proportion of 64 non-dropouts who are *Off Track* and *Far Off Track* at grade 8.

5 NY college and career readiness: <http://usny.nysed.gov/docs/2014-p-12-budget-testimony.pdf>

Figure 2, page 2 of the ACT study reports that 30% of students who are tested at grade 8 are found to be *Off Track* and an additional 27% *Far Off Track*. Using these findings, the calculator estimates the following:

- Students estimated to be *Off Track* is $30/57 = 53\%$ of the *below-proficient* group
- Students estimated to be *Far Off Track* = $27/57 = 47\%$ of the *below-proficient* group

Applying the above percentages to the 64 *below-proficient* survivors from the original group:

- 34 will be *Off Track* (i.e., $53\% \times 64 = 34$ *Off Track* 8th graders)
- 30 will be *Far Off Track* (i.e., $47\% \times 64 = 30$ *Far Off Track* 8th graders)

Estimating the attainment of 12th grade College Readiness Benchmarks from 8th grade reading scores

The following percentages are drawn from Figure 3, page 3 of the ACT study:

- 76% of *On Track* 8th grade readers will reach the 12th grade College Readiness Benchmark
- 29% of *Off Track* 8th graders will reach the 12th grade College Readiness Benchmark
- 10% of *Far Off Track* 8th grade readers reach the 12th grade College Readiness Benchmark

Applying ACT's projections from Figure 3, page 3 to the 84 non-dropouts who are now in grade 8:

- 15 of the *On Track* 8th graders will attain the 12th grade College and Career-Ready Benchmark in reading (i.e., $76\% \times 20$ *On Track* students = 15)
- 10 of the *Off Track* 8th graders will attain the 12th grade College and Career-Ready benchmark in reading (i.e., $29\% \times 34$ *Off Track* 8th graders = 10)
- 3 of the *Far Off Track* 8th graders will attain the 12th grade College and Career-Ready benchmark in reading (i.e., $10\% \times 30$ *Far Off Track* 8th graders=3)

Summary: Of the original 100 *below-proficient* 3rd grade students in reading:

- 28 will reach ACT's College and Career-Ready Benchmark in reading by grade 12 (i.e., $15+10+3=28$)
- 16 will have dropped out
- 56 will have graduated unprepared for college or a career

This estimate lacks the statistical precision customary for a scholarly analysis, but it does allow local leaders—especially educators, school board members, and taxpayers—to see for themselves the critical impact of K-3 reading instruction on coming generations and their economic prospects. Children who have not mastered reading by grade 3 have a greatly diminished chance of succeeding in college or a career; and in an era of declining opportunities for the unskilled, they are mostly consigned to live a life of dependence on some form of public assistance.

Estimating the cost of dropouts and unprepared graduates

The calculator relies on the findings of a study reported as part of a series by the Campaign for Educational Equity hosted by Teachers College, Columbia University. Published fourth in the series, [*Providing Comprehensive Educational Opportunity to Low-Income Students, What Are the Social and Economic Returns*](#) analyzes the broad range of economic benefits and costs that arise as a result of

students failing to graduate or completing high school unprepared for success in college or a career.⁶

In compiling local, state, and federal costs, the calculator counts as high school graduates those non-dropouts whose 12th grade reading proficiency is below the ACT reading benchmark. Only those students who meet the 12th grade reading proficiency benchmark are counted as having some college or an associate degree. Variations such as qualified students not entering a college or career, or unqualified students who complete remedial work are not considered.

The reported findings are expenditures for individuals over their lifetimes (lifetime present values); however, it must be borne in mind that a new cohort of individuals exit k-12 schooling and enter the workforce every year. Thus, as a practical matter, the numbers produced by the ECF calculator cumulate with each succeeding year.

The calculator focuses only on the report's findings pertaining to the lifetime present values of federal, state, and local expenditures made on behalf of dropouts and unprepared high school graduates in the areas of healthcare, criminal justice, welfare, and education (see table 4, page 9). The far more extensive economic costs of schooling failure discussed by the report are beyond the scope of the present project.

The expenditures reported for students with an “associate degree or some college” are the baseline against which expenditures for dropouts and unprepared graduates are compared to determine excess expenditures.

Thus for example, in the case of federal healthcare costs for dropouts versus those for individuals with an associate degree or some college, the estimated federal expenditure for the some-college individual (\$15,770) is compared to the estimated lifetime federal expenditure (\$56,020) for the dropout. The difference (\$40,250) is the estimated excess federal expenditure for healthcare made in behalf of a dropout.

In the case of a federal expenditures, the cost differences are the same nationwide. State and local expenditures, however, are adjusted for local cost of living factors. The most recent data from the Council for Community and Economic Research were the basis for all such adjustments.

For More Information

If you have questions about the use of these estimates and their underlying foundations and limitations, please contact the Education Consumers Foundation at calculator@education-consumers.org.

⁶ Belfield, C., Hollands, F., & Levin, H. (2011). Providing comprehensive educational opportunity to low income students: What are the social and economic returns? New York, NY: Campaign for Educational Equity, Teachers College, Columbia University.