Measuring the Cost of Reading Recovery: A Practical Approach

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Introduction

Reading Recovery is a one-to-one intervention that uses specially trained personnel. Providing this preventive service for the most at-risk first-grade readers often raises cost concerns for participating school districts.

The purpose of this article is to demonstrate that, using standard National Data Evaluation Center (NDEC) reports and data readily available to school districts, local decision makers can calculate the cost and benefit of the Reading Recovery intervention in their school districts. Rather than reporting on specific results, this paper will illustrate a simple method of cost analysis for school districts implementing Reading Recovery.

We do not attempt a full-blown cost analysis here. Reading Recovery serves about 150,000 students in about 3,300 school districts; this represents an average of 45 students per district. Clearly, most districts are not going to engage in a formal cost-effectiveness or cost-benefit analysis of Reading Recovery. Rather, local decision makers will be more interested in a simple but accurate assessment of the cost-efficiency of their Reading Recovery implementation.

Cost analysis is an applied branch of economics. It refers to a broad set of techniques used for evaluation and decision making that takes costs into account (Levin & McEwan, 2001). *Cost-effectiveness analysis,* on the other hand, involves the evaluation of alternatives according to both their costs and their effects in relation to a specific outcome (Levin & McEwan, 2001). Specifically, cost-effectiveness compares costs to units of program objectives (Kee, 1994).

In this paper, I will focus on the cost-effectiveness approach because it is designed to "compare two or more alternatives with similar objectives" (Levin & McEwan, 2001, p. 108). This may be the most direct method of comparing educational programs in terms of costs and outcomes.

An important caveat is in order. In the literature on Reading Recovery, this intervention is often compared to programs that have dissimilar goals or serve different populations. As Reading Recovery serves the lower 20% readers, it cannot readily be compared to interventions that serve all students, as is often done; the outcome or unit of program objective is quite different. Helping a struggling emerging reader to learn to read is a different objective than helping an average student learn to read. Different costs are likely to be involved.

Case studies have repeatedly shown that Reading Recovery provides cost savings. Dyer and Binkney (1995) quantified the costs of alternatives to Reading Recovery and the cost savings that resulted from implementing Reading Recovery. Because the cost of alternatives is evaluated, not their effectiveness in supporting literacy learning, this is not strictly a cost-effectiveness analysis.

The Dyer and Binkney analysis included training costs for Reading Recovery teachers. The alternatives used for comparison were grade retention, Title I placement, and special education placement. When analyzing the cost of grade retention, the cost is assumed to be the yearly expenditure per pupil for that school district. This is almost always considerably more than the cost of the Reading Recovery

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intervention. For Title I analyses, the assumption is made that the child will be served for five years in Title I. Although the yearly cost is lower than for Reading Recovery because instruction is in small groups as opposed to one-to-one, students typically spend several years in Title I, resulting in higher overall costs. For special education, the assumption is that with Reading Recovery, some students will avoid inappropriate referral and placement into special education. Since students are likely to remain in special education throughout elementary school, the overall cost is much greater than other alternatives (Dyer & Binkney, 1995).

Using the same criteria as Dyer and Binkney, Lyons and Beaver (1995) looked at two Ohio school districts. In one district, they found that rates of placement in learning disability reading and in Title I programs decreased as Reading Recovery became implemented. Retention rates were reduced as well; in the other district, both retention rates and learning disability placement declined, resulting in measurable cost savings. Another study in Massachusetts found similar cost savings due to lower special education and Title I referral rates (Assad & Condon, 1996).

With these studies as models and with available district data, a before-and-after comparison of retention and learning disability and Title I placement rates can provide a simple but powerful cost analysis. Even in the absence of any historical data, district administrators can still perform cost-effectiveness analyses.

This paper does not look into more complex issues of training and other ancillary costs for two reasons. First, all reading interventions are going to have training and ancillary costs. Second, most decision makers are not going to invest the considerable resources needed for such an in-depth analysis. I am limiting my scope here to what any local decision maker could do with a standard NDEC school district report,[1] a pocket calculator, and one hour of free time.

The data procedure examined here may not convince everyone that Reading Recovery is cost-effective. However, the Reading Recovery evaluation research design obtains data that can be used as measures of cost-effectiveness. These measures can be used to compare alternative interventions targeting a similar population or to evaluate changes in the efficiency of a local Reading Recovery implementation over time. Because Reading Recovery targets the lowest 20% of readers, any comparison program must also target the most at-risk students.

Methods

The standard unit of reporting for Reading Recovery data is the teacher training site. These sites often encompass more than one school district. In 2000–2001, 571 sites served 3,293 school districts, an average of six school districts per site (Gómez-Bellengé, 2002). NDEC prepares site reports for these teacher training sites. Analyzing costs at the district level is better than at the site level because per pupil spending and teacher salaries are dependent on the school district, not the teacher training site. Funding decisions, as well, are also usually made at the school district level.

Two school districts from a large and diverse midwestern state were chosen for this analysis. They represent two of the most common types of districts served by Reading Recovery:

- urban districts with high poverty and a high percentage of minority students

- suburban districts with relatively low poverty and percentage of minority students.

Specific data about the school districts used in this study comes from the Web site of the state department of education. We also use the standard school district reports generated by NDEC, available to any school district served by Reading Recovery.

The Data: Definition of Terms and Sources

All the data in this study are for the 2000–2001 school year. (Similar information should be available locally for your district.) The following terms and sources serve to better explain the process for calculating the cost-effectiveness of Reading Recovery (illustrated in the tables appearing in this article).

The following information is readily available from state departments of education:

1. **Average Teacher Salary:** This figure has been rounded to the nearest $100 to protect the anonymity of the school district.

2. **Adjusted Teacher Cost:** Because benefits are an important part of the total employment cost, the adjusted teacher cost is the average teacher salary plus an added 30% for fringe benefits.

3. **Annual Spending Per Pupil:** This figure has been rounded to the nearest $100.

4. **Pupil-Teacher Ratio:** This is a districtwide student-to-teacher ratio.

The following come from the standard NDEC district reports.

5. **Reading Recovery Full-Time Equivalent (FTE) Teachers:** The total FTE of the Reading Recovery teach-

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[1] School district superintendents can request Reading Recovery school district reports by calling the National Data Evaluation Center at 614-688-8245.

ers who work in a school district. Table S6 in the NDEC district report lists the number of time slots allotted to Reading Recovery by each teacher. Most teachers have four slots, meaning they teach four children at any one time. This is considered to be 50% FTE. Therefore, one FTE equals eight slots.

6. **Number of Students Served:** Table 2.1 of the district report is the source for this figure.

7. **Number of Reading Recovery Students Served Per FTE:** To obtain the number served per full-time equivalent, the total FTEs are calculated for a school district and then divided by the total number of children served. Tables 2.1 and S6 of the NDEC district report will detail this information.

8. **Cost Per Student Served:** This is computed by dividing the adjusted teacher salary by the number of Reading Recovery students served per FTE.

9. **Number of Discontinued Students:** This figure comes from Table 2.1 of the district report. A discontinued child is a child who successfully met the rigorous criteria to be discontinued from the intervention during the school year or at the time of year-end testing.

10. **Number of Discontinued Students Per FTE:** The total number of discontinued students divided by the total FTE.

11. **Cost Per Discontinued Student:** The number of discontinued students per FTE divided by the adjusted teacher salary.

12. **Number of Students Reaching Text Reading Level 14 or Higher:** This reading level is commonly associated with the second semester of first grade. This is an alternate measure of success although it generally represents a lower standard than the discontinuing rate. The data are found in Table 3.2 of the NDEC district report.

13. **Number of Students Reaching Text Reading Level of 14 or Higher Per FTE:** The number of students reaching that level divided by the total FTE.

14. **Cost Per Student Reaching a Text Reading Level of 14 or Higher:** The number of students reaching that level per FTE divided by the adjusted teacher salary.

Results

The 14 measures described above are calculated based on publicly available information and on the 2000–2001 NDEC district reports for each school district. To help administrators use NDEC reports to perform their own analyses, the numbers of tables from the standard NDEC reports are included here in brackets.

Case 1: Urban District

Background Information
This district has 23 Reading Recovery teachers who served 192 children in 18 schools [Table S0]. Data were also collected for 60 children randomly selected from these 18 schools. The random sample represents the population of higher (top 90%) of readers who did not receive Reading Recovery services. The state's department of education classifies this school district as major urban, very high poverty.

Reading Recovery uses the concept of *level of coverage* to quantify the proportion of the population in need of services that can be served given existing resources. This is defined at the school level. In this urban district of 18 schools, 12 had less than 25% coverage, meaning that instead of serving the lowest 20% readers, as is ideal, the teachers in those schools served the lowest 5% readers. In four other schools, the level of coverage was between 25% and 50%; in one school, it was 50% to 75%; data were missing in one school. Overall in this school district, Reading Recovery should be compared to other interventions serving the lowest 5% to 10% readers.

Reading Recovery has been established for between 3 and 10 years in these schools [Table S1]. One teacher was in the training year, while the others averaged 7 years of Reading Recovery experience Table [Table S5]. The district funds Reading Recovery services from local, state, and Title I funds [Table S2].

Discussion
The average teacher salary was $44,500. Adjusted to include fringe benefits, the cost was $57,850. Although this is a very high-poverty

school district, the $9,400 annual spending per pupil easily surpasses the state average as well as the 1999–2000 national average of $6,911 (U.S. Department of Education, 2002).

The district's student-to-teacher ratio is 11:1. This very low ratio probably includes a large number of nonteaching certified personnel. The Reading Recovery average of students served per FTE is 15.8, meaning Reading Recovery teachers in this district probably work with more students per year than the elementary school average and certainly the first-grade average where ratios are usually lowest. This runs contrary to a common perception that Reading Recovery teachers' case loads are less than those of their colleagues.

The number of FTE teachers was 12.125, and the number of students served was 192. The cost of the Reading Recovery intervention per student served was $3,661. With 145 children discontinuing, the cost per discontinued student was $4,837, a little more than half the annual per pupil spending. Each FTE teacher discontinues almost 12 students per year.

In this district, Reading Recovery teachers serve almost 16 students per year and discontinue successfully almost 12 of those students per FTE position—numbers similar to the class size of many first-grade classrooms. Given the fact that this is one-to-one teaching, this is an important indicator of teacher productivity.

Another way of assessing the cost-efficiency of Reading Recovery is to determine how many children served reach a certain reading level by year-end and how much this costs the district per student. In this district, 128 students reached this level. Level 14 is used as a year-end text reading level because the district average for

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the random sample is 13 and because in some leveled readers, Levels 14 and 16 correspond to the second semester of first grade (see Fountas & Pinnell, 1999). The cost of the Reading Recovery intervention per student reaching Level 14 (regardless of status outcome) is $5,457—still less than the average annual per pupil spending. On average, each FTE teacher brought 10.6 students up to Level 14.

In this particular district, the best gauge of efficiency is probably the cost per child who discontinued. We know that discontinued children do well in this district; they finish the year reading at a much higher level than the district average (by almost six levels), and those who discontinue in the first round make substantial progress between mid-year and year-end.

An assumption is that if these discontinued children had not been served by Reading Recovery, they would have had to repeat a grade at a cost of $9,400. After all, if their peers who were in the top 80% in fall averaged less than a Level 13 at year-end, one can only imagine where these Reading Recovery students, who were the lower 5–10% in fall, would have ended up. If we subtract the $4,837 cost per discontinued student from

Table 1.
Case 1: Urban District Accountability Outcomes

1. Average Teacher Salary	$44,500
2. Adjusted Teacher Cost	$57,850
3. Annual Spending Per Pupil	$9,400
4. Pupil-Teacher ratio	11.1
5. Reading Recovery FTE	12.125
6. No. of Reading Recovery students served	192
7. No. of Reading Recovery students served per FTE	15.8
8. Cost per student served	$3,661
9. No. of Discontinued students	145
10. No. of Discontinued students per FTE	11.96
11. Cost per discontinued student	$4,837
12. No. of students reaching TRL 14 or higher	128
13. No. of students reaching TRL 14 or higher per FTE	10.6
14. Cost per student reaching TRL 14	$5,457

the annual spending per pupil of $9,400, the district saves $4,563 for each student who discontinues (assuming all these children would have repeated a grade). Multiplied by the 145 children who discontinued, the district saves $661,635 in predicted retention costs for an additional year in first grade by this measure of cost savings.

If $4,837 per discontinued child sounds expensive, remember this district spends $9,400 per child to bring the top 80% first-grade children to the inadequate average text reading level of 13 at year-end. If it is expensive to help teach a child to read, it is almost twice as expensive not to teach that child to read if the alternative is grade retention.

The benefits of avoiding retention are more than financial. In addition to the negative financial impact and the obvious negative social impact on the child, retention is often thought to have a negative impact on a child's academic development. Yet, it remains a pervasive practice in districts with a high proportion of poor and minority students (Allington & McGill-Franzen, 1995).

Reading Recovery is not the only literacy intervention in this district; 22 of the 60 children in the random sample received some other type of pull-out literacy instruction. They did not receive Reading Recovery instruction because they were not the lowest readers at the time of selection; these 22 children averaged a text reading level of less than 10 at year-end.

Assuming these children were in a Title I program and assuming each teacher taught 35 children in one school year (see Dyer & Binkney, 1995), we could divide the adjusted teacher cost of $57,850 by 35 to yield

an average $2,630 cost per child served—less than the $3,661 cost for Reading Recovery.

However, if we use an outcome criterion applicable to both groups, the cost per student reaching a text reading level of 14 or higher, we see a different picture. Only four of the students receiving other literacy instruction read at Level 14 or higher at year-end. If a Title I teacher works with 35 students per year, 4 students represent 11.4% of the teacher's time or a total cost of $6,595 per child reaching a text level of 14; this compares to $5,457 for each Reading Recovery child reaching Level 14. Using these criteria, it can be said that Reading Recovery is more cost-effective than other literacy instruction in this school district, even without accounting for the fact that the children identified for Reading Recovery instruction are the lowest-achieving readers and that Reading Recovery is a one-to-one intervention.

These calculations do not include cost savings resulting from fewer and more appropriate referrals to special education. Only one child who discontinued was referred for special education (not literacy related), and only 4 of 15 (26%) children recommended for services were referred for special education [Table 7.1]. In such a population (the lowest 5–10% readers in a high-poverty district), one would expect to see a much larger proportion awaiting screening for special education at year-end. In this district, the state department of education reports that 15% of the entire student population are classified as disabled.

Screening itself is expensive. Shortening the waiting time for testing and reducing the number of children tested is in itself an important contri-

bution. Overall, only 3% of students who received a full program of instruction in Reading Recovery were referred for special education, far lower than the 15% district average classification as disabled.

The cost of the Reading Recovery intervention cannot readily be compared to the annual spending per pupil. A conservative scenario would assume the cost of the Reading Recovery intervention is additional to the annual spending per pupil. This would assume that any instruction or service beyond the regular classroom is additional to the $9,400 annual spending per pupil.

If it is expensive to help teach a child to read, it is almost twice as expensive not to teach that child to read if the alternative is grade retention.

This is unlikely. Many if not most children in the district are the beneficiaries of some form of non-classroom spending. As discussed above, more than one-third of the random sample received Title I literacy instruction; 14 of the 18 schools are schoolwide Title I schools, meaning that all students in those schools receive some form of Title I services. The remaining four schools are Title I schools, meaning many students in those schools also receive Title I services.

Are all these services additional spending? The answer is probably yes in relation to a baseline, but this is a baseline that most students exceed. As mentioned earlier, Reading Recovery

▢▢▢▢ Research

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serves only the lowest 5% of readers in many of these schools. In such a population, special education services, even if only screening and assessment services, are highly likely to be provided as well. This could certainly be seen as additional to any baseline spending.

In these 18 Reading Recovery schools, the percentage of students with disabilities ranges from 6.2% of the school's student population to 24%, with an average of 15.7% of all children classified as having one or more disabilities. Since Reading Recovery served the lowest 5% readers in most of these schools, it is highly likely that many Reading Recovery students also received disability services.

Spending on the Reading Recovery intervention is best seen as additional spending within an array of special interventions, all of which connote spending additional monies beyond any theoretical per-pupil-spending baseline. The issue here centers on the likely academic and financial outcome of these expenditures.

Spending on disability services is not structured to reduce long-term costs by preventing grade retention or to improve academic outcomes relative to the general school population. Title I services tend to be provided over a child's entire elementary school career.

Reading Recovery alone is a short-term intervention that is likely to both prevent grade retention in those children who discontinue successfully and reduce special education placements. In these schools with such high proportions of students classified as disabled, it is reasonable to assume that a child is less likely to continue being classified disabled after discontinuing from Reading Recovery.

In sum, the cost of Reading Recovery can be considered as additional to baseline spending rather than to the annual cost per student because this latter cost includes an array of additional services. Also, the cost of Reading Recovery is likely to reduce future spending where other interventions are not intended to do so.

Case 2: Suburban District

Background Information
This district has 13 Reading Recovery teachers working in seven schools. They served 94 students in 2000–2001 [Table S0]. The state department of education classifies this district as urban/suburban, high socioeconomic status. In this district, three of the seven schools served only the lowest 5% readers (a level of coverage of less than 25%), one served the lowest 10–15%, one served the lowest 15–20%, and two served all of the eligible students, the lowest 20%.

Reading Recovery has been available in these schools, ranging from 1 to more than 10 years [Table S1]. Three teachers were in their training year while the others averaged almost 12 years of experience with Reading Recovery [Table S5]. The district funds Reading Recovery services from local and Title I funds [Table S2].

Discussion
The average teacher salary is $53,700. Adding fringe benefits yields an adjusted teacher cost of $69,810. Annual spending per pupil is $7,900. The student-to-teacher ratio is 16.2. Six FTE teachers served 94 Reading Recovery students, which yields a 15.7 number of Reading Recovery students served per FTE, only slightly less than the district average.

This results in a $4,446 cost per student served. Fifty-nine students discontinued successfully, which amounts to 9.8 discontinued students per FTE, yielding in turn a cost of $7,123 per discontinued student. This is less than the annual spending per pupil. A simple cost analysis that assumes a student who discontinues would have been retained if not served by Reading Recovery yields a saving of $7,900 - $7,123 = $777 per discontinued student. Multiplied by the 59 students who discontinued, this yields a total cost saving to this district of $45,607 for the year. This is the saving of a repeated grade less the cost of Reading Recovery.

There were 60 Reading Recovery students in this district reading at a text reading level of 16 or higher at year-end. Selecting Level 16 instead of Level 14 for the urban district is somewhat arbitrary. The year-end average text reading level for the random sample is 22. The average for discontinued students is 20.[2] If district decision makers feel that students reading at Level 16 can keep up with classroom instruction when the top 80% are reading at Level 22, this would be a valid criterion for measuring cost-efficiency.

There were also 63 students at Level 14 or above and 38 at Level 18 or

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[2] These numbers are rounded to the nearest text reading level.

above. Which level to use is something that needs to be decided at a district level. Using Level 16 as a criterion yields ten students per FTE reaching Level 16 or higher at a cost of $6,981 per student.

Twenty percent of all students receiving a full Reading Recovery program were referred for special education services. However, only 7% of all students were actually placed in special education and only 4% were placed in a literacy-related learning disability program. [Table 7.1]. These proportions for children who were the lowest 20% readers in the fall of first grade compare to nearly 13% of the students in that district classified as disabled. Even though this suburban district's placement percentages for children receiving the full Reading Recovery program are much higher than the national average of 4% referred and placed in special education and 1% referred and placed in

literacy-related special education, the proportions are much lower than the district's percentage of students classified as disabled even though Reading Recovery students are by definition an at-risk group (Gómez-Bellengé, 2002).

Using Alternate Criteria to Analyze District Data

A number of different measures available locally or in the NDEC-generated district reports could be used to evaluate cost-effectiveness. Some of the Observation Survey measures have a ceiling effect and therefore are not appropriate for this type of analysis.

In many cases, local decision makers will want longitudinal follow-up data to gauge the cost-effectiveness of Reading Recovery. This is appropriate if done properly and if results are

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compared to similar interventions that target and work with only the lowest readers. Some teacher leaders have already conducted methodologically sound longitudinal studies (see Lukas, 2001). NDEC is working on a number of initiatives to facilitate longitudinal data collection and analysis by teacher training sites. A student data dump, a spreadsheet with all of a teacher training site's data, is a good starting point for any longitudinal data collection.

Each district should use its own criteria for evaluating Reading Recovery, but a financial analysis should be part of this assessment. Cost analysis as well as program evaluations are most useful when they consider the multiple outcomes of a program or intervention. Clearly, NDEC reports can be a vital part of this process.

In situations where local decision makers feel the program is not performing to their expectations, they need to enlist the help of the local teacher leader in analyzing what the issues are and how improvements can be made. Accountability in education often means little more than assigning

Table 2.
Case 2: Suburban District Accountability Outcomes

1. Average Teacher Salary	$53,700
2. Adjusted Teacher Cost	$69,810
3. Annual Spending Per Pupil	$7,900
4. Student to Teacher Ratio-District	16.2
5. Reading Recovery FTE	6
6. No. of Reading Recovery students served	94
7. No. of Reading Recovery students served per FTE	15.7
8. Cost per student served	$4,446
9. No. of Discontinued students	59
10. No. of Discontinued students per FTE	9.8
11. Cost per discontinued student	$7,123
12. No. of students reaching TRL 16 or higher	60
13. No. of students reaching TRL 16 or higher per FTE	10
14. Cost per student reaching TRL 16	$6,981

blame when outcomes, usually high-stakes standardized tests, do not match externally imposed expectations.

Reading Recovery stakeholders are in a different position because in addition to having outcome data, their standard reports provide them with process data that allow decision makers to see how things need to be changed in order for improvements to occur. This implementation information can be used to improve cost-efficiency over time.

NDEC reports corroborate the effectiveness of the national and local Reading Recovery implementations in several ways: through student status outcomes, Observation Survey scores, retention rates, and placement rates in special education. Any discussion of cost-effectiveness requires that other programs demonstrate that they can produce similarly impressive results with the same population of at-risk students and a dissemination design that allows replication across the variety of educational settings found in U.S. schools. Then we can begin to compare the cost of insuring that no child is left behind.

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