Making a Wonderful Life: Cost-Effectiveness and Return on Investment

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Decisions have consequences. Lives have meaning. In the movie *It's a Wonderful Life*, George Bailey is given the chance to see what impact his life had on his family, community, and country. Here's a little sample:

Clarence: (explaining) Your brother, Harry Bailey, broke through the ice and was drowned at the age of nine.

George Bailey: That's a lie! Harry Bailey went to war! He got the Congressional Medal of Honor! He saved the lives of every man on that transport!

Clarence: Every man on that transport died! Harry wasn't there to save them, because you weren't there to save Harry. (Internet Movie Database)

Only in Hollywood, right? In real life, we make decisions every day and never get to know the full consequences of those decisions or the alternative realities that different choices could create. Evidence, research, and professional judgment often seem like too fallible substitutes for the more miraculous guidance provided by a guardian angel, even one like Clarence, who hasn't yet earned his wings.

Common Core State Standards, response to intervention, achievement gaps, and early intervention are among the many current initiatives that require important decisions and resource allocations. Barbara Hummel-Rossi and Jane Ashdown (2010) have developed new tools to aid administrators and literacy professionals in selecting and implementing these initiatives and interventions. Cost-effectiveness and return on investment may seem more suited to the scheming of an evil banker like Mr. Potter than to the highly principled George Bailey, but even principled decisions have costs.

Hummel-Rossi and Ashdown (2010) help us consider the dimensions of our decisions. In their literature review, they address four guiding questions:

1. What has economic analysis revealed about the importance of early intervention?
2. What do we know about effectiveness and cost-effectiveness of early literacy interventions?
3. What variables (e.g., intervention duration, intensity, implementation fidelity, teacher training) impact the effectiveness and cost-effectiveness of early literacy interventions?
4. How can school administrators integrate cost-effectiveness considerations into their decision making?

I won't try to summarize their 28-page review, or the 75 references (available from the authors as an Excel spreadsheet) that informed their discussion of these questions. Summarizing complex issues is always risky and likely to reflect the biases of the summarizer more than the perspectives of the original authors. Rather than travel that dangerous route, let me share my perspective on the two practical decision tools that Hummel-Rossi and Ashdown (2010) present in the appendices of their article.

The Decision-Making Checklist for Early Literacy Interventions highlights the important, research-based dimensions critical to evaluating and comparing different intervention curricula. It helps decision makers to focus on the salient aspects of the decision-making process. The Methods for Calculation of Cost-Effectiveness and Return on Investment for Literacy Interventions makes cost-effectiveness methodology acces-

sible to those who are not trained as economists or statisticians. A step-by-step worksheet takes the educator through the methods for comparing the cost of alternative early literacy interventions.

Decision-Making Checklist for Early Literacy Interventions

The Decision-Making Checklist for Early Literacy Interventions (Hummel-Rossi & Ashdown, 2010, Appendix A) is a relatively easy tool to apply to Reading Recovery and alternative early intervention approaches. This tool (the Checklist) requires rating the amount of evidence (little, moderate, or substantial) related to five intervention characteristics: Student Achievement, Program Comprehensiveness, Capacity Building, Efficiency and Efficacy of the Design, and Cost Factors.

"Relatively easy" may be somewhat of an exaggeration given that the What Works Clearinghouse (WWC) was only able to find 52 qualifying studies in their review of 183 beginning reading programs (WWC, 2007a). Most of these programs had no studies that qualified as evidence of student achievement. The WWC evaluation provides the strong foundation that supports the other evidence available related to the questions in this section (Schwartz, Askew, & Gómez-Bellengé, 2007; WWC, 2007b). Their analysis of the experimental evidence establishes that Reading Recovery causes the large increases in student performance and that these increases are much larger than what would be expected by just participating in classroom instruction.

With this foundation in place, the national Reading Recovery evaluation data, published annually on every participating child from districts around the country (https://www.idecweb.us/Documentation.asp), provides additional information on achievement outcomes. Once it is established that an intervention causes achievement gains, additional experimental studies aren't needed to address other important questions related to student achievement. The Reading Recovery evaluation data has been used to demonstrate that participating students do close the achievement gap with their average peers, that these gains are substantial for subgroups by gender, race, socioeconomic status, and for English language learners (Brown, Denton, Kelly, & Neal, 1999; Kelly, Gómez-Bellengé, Chen, & Schulz, 2008; Rodgers, Gómez-Bellengé, & Wang, 2004; Rodgers, Gómez-Bellengé, Wang, & Schulz, 2005), and that these achievement gains reduce special education referrals (O'Connor & Simic, 2002; Schmitt, Askew, Fountas, Lyons, & Pinnell, 2005; Schwartz, 2009; Schwartz, Hobsbaum, Briggs, & Scull, 2009). With this evidence, Reading Recovery rates high on the five questions about student achievement on the Hummel-Rossi and Ashdown checklist. The combination of experimental studies and evaluation data from thousands of students and hundreds of districts is a research base that is not matched by any other early intervention approach.

The next three sections of the Checklist address issues related to implementation, professional development, and measurements for screening and determining outcomes. Reading Recovery is widely recognized for its strengths in these areas. Evidence related to each of these topics is nicely summarized in *Changing Futures: The Influence of Reading Recovery in the United States* (Schmitt, et al., 2005).

One issue that Hummel-Rossi and Ashdown raise related to implementation is the intensity of the delivery model. In response to intervention (RTI) discussions this often relates to tiers of intervention. As school budgets continue to be slashed, many administrators decide they can't afford to provide individual instruction for their most at-risk first graders. It is easy to implement this type of cut and then ignore the impact of this decision on outcomes for the most at-risk children. Since Clarence isn't available to show the impact of this decision on children's lives, Schwartz, Schmitt and Lose (in press) examined how teacher-student ratios influence intervention outcomes.

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Administrators justify the decision to shift from individual instruction to small groups as cost-effective. They often value the expertise of their Reading Recovery teachers, but want to reach more children at a lower cost. To accomplish this they abandon their individual Reading Recovery intervention and reallocate these teachers to working in small groups with a ratio of 1:5, or higher. Schwartz et al. (in press) found that this change reduced the ability of these teachers to achieve outcomes that closed the achievement gap from 60% in the one-to-one condition to 20% in the one-to-five condition. Only individual, early intervention had the power to accelerate learning for the lowest-performing first graders. Schwartz et al. conclude that a combination of one-to-one and small group services could be optimized by adjusting the balance among these services based on local outcome data.

Methods for Calculation of Cost-Effectiveness and Return on Investment

The final section of the Checklist returns to the issue of costs and return on investment (ROI). For this discussion we move to Hummel-Rossi and Ashdown's (2010) second decision tool. In Appendix C, they present Methods for Calculation of Cost-Effectiveness and Return on Investment for Literacy Interventions (the Methods). The Methods worksheets provide support for the calculation of costs and ROI from two alternative approaches to early intervention. The comparison of alternatives is central to any analysis of cost-effectiveness (Hummel-Rossi & Ashdown, 2002). Both the cost and effectiveness information needs to be judged against some alternative, even if that alternative is no early intervention support. This judgment of effectiveness against an alternative is why the What Works Clearinghouse only reviews research studies with a comparison group.

To make this process somewhat more manageable for a school or district, Hummel-Rossi and Ashdown (2010) envision two cohort groups: perhaps the set of at-risk first graders from the year prior to implementing the new program (comparison group) and the first set of at-risk first graders to participate in the new approach (intervention group). Cost and benefits for both groups would be collected from first grade through fourth grade. For both groups, the worksheets support calculation of costs related to salary, training, materials, and subsequent resource room or special education support. The benefits would be measured based on end-of-year scores on some measure that provides a meaningful indication of growth, like the Development Reading Assessment (DRA) or Clay's Text Reading Level.

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Given this information, Hummel-Rossi and Ashdown (2010) show how to calculate a cost-effectiveness ratio for each year and how to use this information to think about the ROI over the 4-year period. Dividing the literacy gains for each group by the costs for that intervention provides their relative cost-effectiveness. If over the 4-year period the intervention group achieves at a higher level than the comparison group, and the long-term costs are similar, this would indicate a positive ROI.

The Center, Wheldall, Freeman, Outhred, and McNaught (1995) study provides a good data set to illustrate this logic. They tracked a Reading Recovery intervention group and an equivalent comparison group of at-risk students from the beginning of first grade and reported the relative performance of these two groups on multiple measures at the end of the intervention period, the end of first grade, and the middle of second grade. They did not report cost information, but we can project the cost-effectiveness using some upper and lower limits on costs. Schwartz et al. (2009) provide additional analyses of the mid-second-grade data not included in Center et al. (1995). On Clay's Text Reading measure the effect size at this point is 1.55 standard deviation units (text level 17.4 for the Reading Recovery group versus 6.9 for the comparison group). To turn this into a cost effectiveness ratio, we need some estimation of cost. The upper and lower limits for per pupil cost in the literature range from $2,500 per student to a high of $10,000 per student (Gross, Jones, Raby, & Tolfree, 2006; Shanahan & Barr, 1995). Dividing the effect size by these limits gives the cost-

Decisions made by administrators like Dr. Dot Schoeller, principal at Gwinnett County Public Schools in Georgia, change the professional lives of teachers and provide a strong literacy start for first-grade students.

effectiveness per $1,000 of per pupil expenditure. These cost-effectiveness estimates range from 0.15 to 0.62 for these upper and lower cost estimates, respectively.

Is this good? Hummel-Rossi and Ashdown (2010) discuss an article by Borman and Hewes (2002) that describes a cost-effectiveness comparison of Success For All against three other large-scale literacy interventions, the Tennessee Class-Size Reduction Program, the Abecedarian Project, and the Perry Pre-School Program. The cost-effectiveness ratios for these four programs on reading measures were 0.09, 0.07, 0.03, and 0.07, respectively (Borman & Hewes, 2002, Table 4, p. 257). Even with the highest per pupil estimate, Reading Recovery would be the most cost-effective intervention among this set.

I've presented a simplified version of the cost-effectiveness analysis conducted by Borman & Hewes (2002) or described in the Methods by Hummel-Rossi and Ashdown (2010). In a long-term analysis the achievement differences might not be as large. Changes in types of outcomes measured for older readers and the amount of variation in these outcomes work to reduce estimates of effect size.

The Center et al. (1995) study also has implications for Reading Recovery as an RTI approach that can reduce long-term cost from overidentification of students for special education (O'Connor & Simic, 2002; Schwartz, et al., 2009). By the middle of second grade, 66% of the comparison group students had a text reading level of 4 or below. This is the level of average students in the beginning of first grade. The achievement gap for these initially at-risk students relative to their average peers has greatly increased. All of these children are now likely candidates for learning disabled (LD) reading services. In the Reading Recovery group, only 10% of the students had text reading levels below 10. If these represent the results for the bottom 20% of the first-grade cohort, the special education rates would be 13.2% for the comparison group versus 2% for the Reading Recovery group. The savings on long-term costs for special education services, in this type of scenario, would certainly lead to a positive ROI.

Implications for Decision Makers

As Hummel-Rossi and Ashdown (2010, p. 21) recognize, the "economic complexities of decision making" may deter administrators from following this path. The tools they provide will help your decision-making team to navigate this path, but it is unlikely that the final decision will be based solely on an economic analysis. A comprehensive and effective system for early literacy instruction is a central part of every school's mission. Achieving this goal with maximum efficiency is the major reason for engaging in cost-effectiveness analysis. Developing and refining an effective and efficient comprehensive approach is hard work that goes well beyond the initial decision to adopt a particular program or approach.

Schools and districts that take on this mission have been able to accomplish remarkable results by carefully attending to local data as they refine their system. Administrator's reflections on this mission are shared on the RRCNA website (RRCNA, 2011a, 2011b).

For example, Lisa McLaughlin, principal of Deer Park Elementary, TX, explains, "When the school board was looking at programs to cut, one thing that really convinced them to keep Reading Recovery was that we were able to present them with data, longitudinal data, on student performances. We could show that students who had been through Reading Recovery in first grade—kids who had been way behind in first grade—by third grade had passed the TAKS (Texas Assessment of Knowledge and Skills) test."

Randy Overbeck, assistant superintendent of Ohio's Xenia Community Schools says Reading Recovery is "instructionally effective. Compare it with any other approach that you will use — I don't care if it's a pull-out model, if it's a replacement model, if you study how the impact that dollars have on a per child basis, you will find over and over again that the instructional impact is stronger and more long-term going the Reading Recovery route than taking those same dollars and using them differently."

Dr. Robert Villarreal, former principal of Eastridge Elementary School in Aurora, CO, experienced similar success in his setting with "723 students, 47% on free and reduced-price lunch; 60% are children of color who represent five of the world's seven continents and speak 42 different languages." All of his lowest-ranked first graders were supported by Reading Recovery teachers and achieved positive outcomes. He met with each child at the beginning and end of their Reading Recovery intervention. Dr. Villarreal said, "I'll often tell them, 'When you came here 20 weeks ago, you couldn't name three letters, now you're reading at level 16!' The child's wide, toothy smile of achievement often brings tears to my eye."

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The decisions by these principals and others to implement effective early intervention services make wonderful lives. Their decisions changed the professional lives of teachers and the school experiences of thousands of children. Of course, we don't need the miraculous insight of a guardian angel like Clarence to imagine the lives of children who struggle with literacy. We all know too many of these children. Instead, imagine what our country will be like when every child receives a strong literacy start in first grade, because a Reading Recovery teacher is there for those children who need help the most, because a dedicated administrator was there to make it happen!

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