We Don't Need No Stinkin' Exercises: The Impact of Extended Instruction and Storybook Reading on Vocabulary Acquisition

Jeff McQuillan

Introduction

Reading stories to young children has a significant impact on a child's vocabulary development (Mol & Bus, 2011).[1]Children acquire words incidentally by being read to, and show growth in word knowledge even upon a single exposure to a novel word (Carey & Bartlett, 1978). In general, the more exposure to an unknown word children have, the more likely they are to acquire that word, without any explicit vocabulary instruction (Robbins & Ehri, 1994). These findings are consistent with current theories of language acquisition (Krashen, 2003; Smith, 2004), which hold that the development of literacy is primarily a result of language comprehension (listening and reading), not of direct instruction and "practice."

Despite the success of "unaided" storybook reading in promoting vocabulary growth, several researchers have attempted to improve the effectiveness of reading stories to children by adding explicit instruction of unknown words in the story. Wasik, Hindman, and Snell (2016) reviewed 36 studies on the effectiveness of various vocabulary interventions with storybook reading, including re-readings, dialogic reading, questioning, defining, props, and additional or "extended activities." They concluded that "word learning was enhanced when adults asked questions and engaged children in discussion about target vocabulary words, relative to simply recasting the meanings of the words" (p. 52). Nevertheless, the overall effects of these interventions were modest, accounting typically for less than 10% of the variance explained in vocabulary scores (p. 53).

Although the gains from instruction appear to be small, some researchers have argued that "at-risk" children especially need intensive vocabulary teaching. Coyne, Simmons, Kame'enui, and Stoolmiller (2004), for example, advocate for what they term "conspicuous instruction":

> Conspicuous instruction is explicit and unambiguous and consists of carefully designed and delivered teacher actions. During vocabulary instruction, this would include direct presentations of word meanings using clear and consistent wording and extensive teacher modeling of new vocabulary in multiple contexts. (p. 149)

Wasik et al. (2016) included in their review 15 studies that contained some form of this intensive approach. All of the studies included giving children word definitions during the reading of the story, as well as post-reading activities intended to promote vocabulary acquisition. In all cases, the researchers found that children receiving direct instruction made significant gains in word knowledge on immediate post-tests.

But raw score gains on a vocabulary measure alone is an insufficient reason to recommend direct instruction. Teachers must also consider the *time efficiency* of instruction – in this case, how many words are gained per unit of time.

Since at-risk children are thought to need direct instruction in order to "catch up" to their age peers, a focus on efficiency should be of particular interest to vocabulary researchers. Yet in none of the 15 studies did the researchers attempt to calculate the relative efficiency of their approach.

Previous reading acquisition studies have shown that while some forms of direct instruction can lead to greater absolute word gains on post-tests, when the efficiency of instruction (words gained divided by instructional time) is considered, simply reading or being read to is usually as good as or superior to direct instruction. Krashen (1989) re-analyzed several studies of vocabulary instruction and concluded that most forms of instruction were less efficient in terms of promoting vocabulary growth than simply reading. McQuillan (2016) found a similar pattern for second language acquirers: "reading only" conditions were more time efficient as a means of improving vocabulary growth than reading plus direct instruction.

In this paper, I examine the studies from Wasik et al.'s review that included some form of extra or "extended" instruction. I calculate for each study the relative efficiency of storybook reading alone versus storybook reading plus post-reading vocabulary activities to determine if the added instruction really was worth the extra time teachers spent on it. I also compare the rates of "forgetting" in studies that included both an immediate and delayed post-test.

Analysis

Study Selection

Of the 15 studies that included some type of "additional instruction" in Wasik et al. (2016; Table 5, p. 49), eight did not include a reading-only comparison group that used same storybooks as the treatment group (Coyne, McCoach, & Kapp, 2007 (Study 2); Coyne, McCoach, Loftus, Zipoli, Ruby, Crevecoeur, & Kapp, 2010; Gonzalez, Pollard-Durodola, Simmons, Taylor, Davis, Kim, & Simmons, 2011; Leung, 2008; Loftus, Coyne, McCoach, Zipoli, & Pullen, 2010; Beck & McKeown, 2007; Silverman, Crandell, & Carlis, 2013; and Zipoli, Coyne, & McCoach, 2011).Three of the studies had appropriate comparison groups but lacked sufficient information on the amount of time spent in the experimental or comparison condition (Wasik & Bond, 2001; Wasik, Bond, & Hindman, 2006; and Zucker, Solari, Landry, & Swank, 2013).[2]

This left only four studies with enough data to calculate instructional efficiency: Coyne, McCoach, & Kapp, 2007 (Study 1); Coyne, McCoach, Loftus, Zipoli, & Kapp, 2009 (Study 2); McKeown & Beck, 2014 (Study 3); and Weisberg, Ilgaz, Hirsh-Pasek, Golinkoff, Nicolopoulou, & Dickinson, 2015 (Study 4). To these four I've added: Loftus-Rattan, Mitchell, and Coyne (2016), which was published after Wisek et al.'s review.

Time Estimates

Not all studies reported detailed information on the time spent on instructional activities. For those that did not, I justify my estimate in my discussion of the study, attempting to be as conservative as possible when estimating the total time of the intervention (i.e. using the lowest time estimate I could reasonably derive from the description of the instruction).

Determining a proper estimate for incidental exposure to a word during storybook reading is more problematic, however. How much reading time should be allotted to individual words read within the story? In studies of "context effects" in word acquisition, the single sentence in which the novel word appears is often considered the unit of analysis (e.g. Stanovich, 1982; West & Stanovich, 1978). This would mean the time spent on each incidental exposure would be around five seconds for most sentences in a typical storybook.

Coyne, McCoach, Loftus, Zipoli, and Kapp (2009, Table 3, p. 14) suggested an estimate of 10 seconds per incidental word exposure, which would effectively extend the "context" for the target word to one or two sentences prior to the one containing the word itself. I use Coyne et al.'s10-second estimate for the incidental exposure conditions in my analysis. A 10-second estimate is sufficient to account for the immediate context around the target word, as well as representing a more conservative approach than the estimates used in previous studies of context effects.

The *relative* efficiency of incidental exposure versus direct instruction is calculated here by first determining the number of words gained per minute in each condition (efficiency), and then using the formula:

(Incidental Exposure Efficiency /Direct Instruction Efficiency)/

Incidental Exposure Efficiency X 100.

Since three of the studies used very similar designs (Coyne et al., 2007; Coyne et al., 2009; and Loftus-Rattan et al., 2016), I discuss those first, followed by the McKeown and Beck (2014) and Weisberg et al. (2015) studies.

Study 1: Coyne, McCoach, & Kapp (2007)

Coyne et al. (2007) used a within-subject design to study the effects of extended instruction versus reading-only with a group of kindergarten children ($N = 31$). All the students heard the same story (*The Three Little Pigs*) read to them three times containing six target words. Students were given a pre-test on all of the target words. Direct instruction was given on three of the six target words as part of the "Extended Instruction" condition. The two conditions in which words were encountered were:

1. Incidental Exposure: Teachers read the storybooks as they usually did without any vocabulary explanations or "follow-up" activities related to the target words.
2. Extended Instruction: Teachers reviewed the target words before the story was read, and asked students to listen for the three words and raise their hands when they came up in the story. The teacher then gave a definition of the word (e.g. "A *weald* is forest or some woods" (p. 398)), re-read the line in which it appeared, and had the children repeat the word. After the story was read, there were follow-up activities with additional direct instruction on the three target words.

Children were given a battery of tests that included both "expressive" or recall tests (e.g. "What does *cauldron* mean?") and "receptive" or recognition tests (e.g. "Which of these two sentences uses the word *cauldron* correctly?"). Students scored higher on words in the experimental condition than in the reading-only or incidental condition on both vocabulary measures, but scored relatively higher on the recall measure than on the receptive one. In order to present the "best-case scenario" for direction instruction, I used the recall measure to calculate efficiency, as it favored more heavily extended instruction.

Table 1 contains the recall gain scores on the immediate post-test, the time spent on the target words in each condition, the words per minute gained on the post test, and relative efficiency (that is, how much more or less efficient reading-alone was compared to extended instruction). There was a maximum score of 2 points awarded for each word on the recall test, so gain scores were divided by two to yield the number of words acquired.

The reading-only condition spent a total of 1.5 minutes on the three target words (10 seconds X 3 readings X 3 words). The researchers reported that the total time for the post-reading

vocabulary activities for each of the three readings of the story was around 15 minutes (15 minutes X 3 readings = 45 minutes).

However, to this figure must be added the additional time for vocabulary instruction given before and during the reading. Coyne et al. (2007) did not provide any data on this part of the treatment, but in a nearly identical study design used in a later study (Coyne et al., 2009), the researchers used an estimate of one minute per word per reading for pre- and during-reading instruction (what they called "embedded instruction"). This would add 9 minutes to the extended instruction (1 minute X 3 readings X 3 words), making the total extended instruction time 54 minutes.

As seen in Table 1, the words that children encountered incidentally in the text were acquired almost one-third (31%) more efficiently than those given extended instruction.

Table 1: Word Gains and Relative Efficiency on Recall Tests in Coyne et al. (2007)

	Extended Instruction	**Reading Only**
Recall scores (immediate post-test) (max. score = 3)	2.12	.085
Time on treatment (minutes)	54	1.5
Words per minute	.039	.057
Relative efficiency of reading-only vs. extended instruction	+31%	--

From Coyne et al., 2007, Tables 1 and 2. Recall gains adjusted for pre-test scores

Study 2: Coyne, McCoach, Loftus, Zipoli, &Kapp (2009)

Coyne et al. (2009) compared three different conditions of word exposure in a within-subjects design with kindergarten students ($N = 42$). As in Coyne et al. (2007), students heard a storybook (*Goldilocks*) read three times. There were 9 target words included in the story. Three of the words were given "extended instruction" similar to what was done in Coyne et al. (2007). Three words were part of the reading-only condition, and three words were presented in "embedded instruction."

Embedded instruction involved asking students to say the words before the story was read, to listen for the words in the story, and then to raise their hands when they heard them. Teachers then gave "simple definitions" of the words and then re-read the sentence containing the word (p. 7).

Coyne and colleagues estimated the amount of time spent on embedded instruction (before and during the reading) was approximately 1 minute per word per reading (Table 3, p. 14), so the total time was 9 minutes (1 minute X 3 readings X 3 words). The extended instruction (post-reading activities) took about 15 minutes per reading, for a total of 45 minutes (15 minutes X 3 readings). As in Coyne et al. (2007), we must add the time spent on embedded instruction (9

minutes) to the extended instruction estimate, for a total of 54 minutes.

Similar to Coyne et al. (2007), students were given a pre-test on the target words and then both recall and comprehension vocabulary measures as post-tests. However, since the researchers determined that students were not performing above chance on the pre-tests, only post-test scores were used in their analysis. The greatest raw score advantage for the extended and embedded instruction conditions compared to reading-only was again on the recall tests, so that is the data I used for the efficiency calculation.

Table 2 lists the number of words gained, the time on treatment, the words gained per minute, and the relative efficiency of the reading-only condition versus embedded and extended instruction.

Words in the reading-only condition were acquired at the same rate as those in the embedded instruction condition, meaning there was no advantage for the pre- and during-reading activities on vocabulary growth. The extended instruction condition did far worse, however, with reading-only proving to be 50% more efficient than providing extended direct instruction.

Table 2: Time Efficiency of Extended Instruction and Reading-Only for Vocabulary Acquisition in Coyne et al. (2009)

	Embedded Instruction	Extended Instruction	Reading Only
Recall scores (immediate post-test) (max. score = 3)	.73	1.89	.12
Time on treatment(minutes)	9	54	1.5
Words per minute gained	.08	.04	.08
Relative efficiency of reading -only vs. condition	0%	50%	--

From Coyne et al., 2009, Table 1, p. 11

Loftus-Rattan, Mitchell, &Coyne (2016)

Loftus-Rattan et al. (2016) is a partial replication of Coyne et al. (2009). The researchers compared three storybook reading conditions in a within-subjects design with a group of preschool children ($N = 25$), with three unknown target words per condition. The three conditions were identical to those described previously for Coyne et al. (2009): reading-only, embedded instruction, and extended instruction.

The children were randomly assigned to one of the three storybook conditions, and heard the story (*Goldilocks*) three times over a period of one week. There were given similar recall and comprehension vocabulary measures as post-tests as used in the Coyne et al. (2007).

For reasons that are not explained, Loftus-Rattan et al. used different instructional time estimates for the embedded and extended conditions than those used in previous studies, even though the descriptions of the procedures used were the same. This may be due to better tracking of teacher instructional time in this study, but no explanation is given.

For the embedded instruction condition, Loftus-Rattan et al. estimated teachers spent 2 minutes per word per reading, for a total of 18 minutes per three word set (2 minutes X 3 reading X 3 words). For the extended condition, the post-reading instruction time is estimated to be 5 minutes per word. Adding this 5 minutes to the 2 minutes used in pre- and during-reading instruction, we get a total of 63 minutes (7 minutes X 3 reading X 3 words). Results from the three conditions are shown in Table 3.

The reading-only condition was 79% more efficient for word acquisition than extended instruction, and 75% more efficient than the less intensive embedded instruction. Alternatively, we

Table 3: Time Efficiency of Embedded Instruction, Extended Instruction, and Reading-Only in Loftus-Rattan et al. (2016)

	Embedded Instruction	Extended Instruction	Reading Only
Recall scores (immediate post-test) (max. score = 3)	.30	.94	.10
Time on treatment(minutes)	18	63	1.5
Words per minute gained	.016	.014	.066
Relative efficiency of reading -only vs. condition	76%	79%	--

From Loftus-Rattan et al., 2016, Table 1, p. 402

could calculate efficiency by simply dividing the words per minute gains of the reading-only condition by the gains made by experimental conditions. Using this approach, we find reading-only words were acquired at more than four times the rate of those in either the embedded or extended instruction conditions.

Study 3: McKeown & Beck (2014)

McKeown and Beck (2014) compared three storybook reading conditions using a within-subjects design with a group of kindergarten students (N = 131): repetition, "interactive," and control. The researchers choose (or inserted) 10 target words into each of three stories, for a total of 30 target words. Words presented in the control condition were heard just once in the context of the storybook, without any explanations or extension activities. Words in the repetition and interactive conditions were heard at least 12 times over a seven-day "instructional cycle."

On Day 1 of the repetition condition, the first reading of the storybook included a brief definition of each target word after it occurred in the story, followed by additional review for five of the 10 target words for that story. The review consisted of re-reading the sentences in which the target words occurred, "paraphrasing the context, and presenting the friendly explanation." On Day 2, the story was read again with target word definitions inserted, and the other five target words were reviewed after the reading. Day 3 included reading the story a third time, with definitions given for all the words once more while reading. Days 4 to 7 consisted of "activities to practice the friendly definitions," including "game-like formats such as "Concentration" that required matching words to their definitions (p. 523).

The interactive condition's seven day cycle began by reading the entire story to the children without interruption, followed by reviewing five of the target words in a manner similar to the repetition condition review. Then "follow-up" activities took place for the first five words "in which students were asked to distinguish between examples and non-examples of the word's application" (p. 523). Day 2 was a repeat of Day 1, but with the second set of five target words. Days 3 to 7 involved even more activities related to the 10 target words, such as asking if the use of a word in a particular sentence made sense and explaining why or why not.

Unlike one of their previous studies on storybook reading and direct instruction (Beck & McKeown, 2007), McKeown and Beck gave no time estimates for any of their activities.[3] For the "control" or reading-only condition, I again used 10 seconds per word based on Coyne et al.'s (2009) estimate for incidental exposure. This gives us a total of 5 minutes (10 seconds X 10 target words X 3 stories).

For the repetition group, I estimated 30 seconds for the within-the-story definition (listening to the sentence with the target word plus explanation), similar to previous estimates from Coyne et al. (2009). To this I added three minutes per day to review the five words after the story was read for Days 1 to 3, for a total of 24 minutes. For Days 4 to 7, I added an additional 10 minutes per day to review the 10 target word definitions and engage in related follow-up activities. This gives us a total estimate of 54 minutes for the seven-day cycle.

For the interactive condition, I estimated slightly more time, since the treatment description indicates this was a more intensive form of instruction, presumably with more time and activities per word. I estimated an additional 5 minutes per day for each seven-day cycle, for a total of 101 minutes (54 + (7 X 5). Based on the descriptions of the instruction provided by McKeown and Beck, 5 minutes per day is almost certainly an underestimate of the actual instructional time.

Children in all three conditions were given a several vocabulary assessments, including meaning recognition and production tests. Since the effect size differences between the control and experimental conditions were overall highest in the production/recall measure on the raw number of words gained (d = .44 for repetition condition and .70 for the interactive condition),

Table 4: Time Efficiency of Repetition, Interactive, and Control Conditions in McKeown and Beck (2014)

	Repetition	Interactive	Control (Reading only)
Production scores (immediate post-test) (max. score = 10)	1.43	1.92	.61
Time on treatment(minutes)	54	104	1.6
Words per minute gained	.027	.018	.381
Relative efficiency of reading-only vs. condition	93%	95%	--

From McKeown & Beck, 2014, Table 7, p. 526

I used that measure in Table 4 to estimate the time efficiency of the instructional conditions.

Words presented in the reading-only condition were acquired 93% more efficiently than those in the repetition treatment, and 95% faster than in the more intensive, interactive condition. Not only is simply reading the storybook more efficient than direct instruction, but the more time spent on direct instruction, the less efficient it became. Compared to the reading-only condition, the relative efficiency of the more time-intensive interactive condition was lower than the repetition condition, despite the fact that the interactive condition took almost twice as long.

Study 4: Weisberg, Ilgaz, Hirsh-Pasek, Golinkoff, Nicolopoulou, and Dickinson (2015)

Weisberg, Ilgaz, Hirsh-Pasek, Golinkoff, Nicolopoulou, and Dickinson (2015) compared three conditions under which a group of pre-school children ($N = 154$) encountered novel vocabulary. In the "exposure" condition, words appeared in either "realistic" or "fantastical" themed storybooks, but were not defined or discussed by the teacher. In the second condition, "target" words appeared in realistic themed books, which were also taught using direct instruction. The third condition was identical to the second, but the words appeared instead in "fantastical" themed books.

Each book contained 10 target words that were taught explicitly, and each child heard two stories from their assigned theme, for a total of 20 target words taught over the eight storybook reading sessions. In addition to the target words, there were eight realistic and nine fantastical exposure words that appeared in the stories to measure incidental, uninstructed word acquisition.

Teachers in the experiment were given "bookreading scripts" to guide their instruction. After one of the target words appeared in the story, teachers stopped and gave a definition of the word (e.g. "The little dragon came out of the egg; he *emerged* from it. See how Grog is *emerging* from the egg?" (Weisberg et al., 2015, p. 5)). At the end of each book, teachers reviewed all of the target words, using both hand gestures and illustrations from the book. In addition, the realistic and fantastical target words were included in a set of "play" activities that were also scripted for the teachers. Toys related to the 10 target words from that book were used during this post-reading instruction.

Weisberg et al. noted that the storybook reading sessions, including during-story definitions of target words and the post-reading play sessions, each took 10 minutes. I estimated that the reading only "exposure" condition took a total of 11.3 minutes (average of 8.5 words per story X 10 seconds X 8 sessions). For the target word instruction, I assigned 30 seconds per during story word definition, plus the 10 minutes of "play" activities, for a total of 120 minutes ((10 words X 30 seconds) + 10 minutes of post-reading activities) X 8 sessions).

Children were given vocabulary comprehension and production tests pre-tests and immediate post-tests. The comprehension test included four illustrations, and children were asked to point to the one closest to the meaning of the word. The production measure involved asking the child to recall the meaning of the word in a one-on-one interview with the experimenters.

Since there were fewer total exposure words than target words, the researchers reported their results as the percentage of correct answers. In Table 5 below, I have multiplied the percentage gain, pre-test to post-test, by the number of total number of words encountered in that condition: out of 20 words for the instructed words, and out of 17 words for the

Table 5: Time Efficiency of Extended Instruction and Reading-only Conditions in Weisberg et al. (2015)

	Instructed: Fantastical	Instructed: Realistic	Exposure (Combined)
Production scores (max. score = 20 instructed; 17 exposure)	7.8	7.4	2.5
Time on treatment (minutes)	120	120	11.3
Words per minute gained	.065	.062	.22
Relative efficiency of reading -only vs. condition	70%	72%	--

From Weisberg et al., 2015, Table 3, p. 9

exposure condition (combining fantastical and realistic themes).

The reading-only words were acquired 70 - 72% more efficiently than words encountered in the direct instruction conditions, with little difference between the themes of the words.

Vocabulary Retention: Studies with Delayed Post-Tests

Three of the five studies reviewed above included delayed post-tests to measure the amount of vocabulary retention (Coyne et al., 2007; Coyne et al., 2009; and Loftus-Rattan et al., 2016). I summarize in Table 6 the recall vocabulary scores (raw scores) for all three studies for the immediate post-test (done within a few days after the treatment) and the delayed post-test, given 6 – 8 weeks later. When there was more than one treatment group, I used the data from most intensive form of instruction provided (extended instruction) for the experimental group. Both the immediate and delayed post-test cores for Coyne et al. (2007) were adjusted for pre-test scores.

To calculate the percent of word knowledge loss over time, the delayed post-test score was

Table 6: Vocabulary Retention in Extended Instruction vs. Reading-Only Condition Vocabulary Recall Scores from Immediate to Delayed Post-Test

	Coyne et al. (2007)		Coyne et al. (2009)		Loftus-Rattan et al.(2016)	
Group	Extended Instruction	Reading-Only	Extended Instruction	Reading-Only	Extended Instruction	Reading-Only
Immediate Post Test (words gained)	2.12	.09	1.89	.12	.94	.10
Delayed Post-Test (words gained)	1.45	.17	.91	.12	.76	.08
% Change in recall scores*	-27%	+88%	-52%	0%	-19%	-20%

*% Change = (Immediate posttest - Delayed post-test)/Immediate post-test

subtracted from the immediate post-test score, and that result was divided by the immediate post-test score.

In two of the three comparisons, scores in the direct instruction condition declined considerably more than the reading-only condition. In Loftus-Rattan et al. (2016), the decline in scores was virtually the same. The average change for the extended instruction words across the three studies was -33%; for the reading-alone condition words, it was +23%.

Discussion

Reading alone was more efficient for vocabulary acquisition than reading plus extended instruction in eight of the nine comparisons reviewed here, and was as efficient in the remaining one. This was true even though we used measures that most favored the direct instruction conditions (production or recall tests). The average of the efficiency advantage for "just reading" over explicit instruction was 63%. This is a large, practical difference for teachers to consider when allocating their limited instructional time.

Our findings are similar to those from other areas of literacy acquisition in both the first and second language. Nagy, Herman, and Anderson (1985) found that incidental acquisition of vocabulary during reading could account for a much larger proportion of word knowledge growth among elementary school students than could direct instruction. Mason and Krashen (2004) found for their adult second language acquirers that simply listening the a story being read to them was more efficient than adding additional "extension" or "practice" activities. Mason, Vanata, Jander, Borsch, and Krashen (2008) reached a similar conclusion: simply listening to a story was more efficient than listening plus vocabulary instruction for adults studying German. Mason (2007) reported that English students in traditional form-focused language classrooms acquired vocabulary less efficiently than those who listened to and read stories. McQuillan (2016) also found similar results in his review of seven studies of adult second language vocabulary acquisition.

Simply reading storybooks to children is not only more efficient that the use of direct instruction, but it also produces more lasting vocabulary gains. Studies that included a delayed post-test reported consistent losses on the vocabulary recall scores of the direct instruction words, and an overall greater loss of knowledge compared to those words gained incidentally. This finding is again consistent with previous research on vocabulary growth as well as other areas of language acquisition (Krashen, 2003). McQuillan (2016), for example, found in a survey of second language vocabulary studies that there was far greater retention when words were encountered incidentally versus in direct instruction.

Why have so few reading researchers used time efficiency calculations to evaluate their own studies? One reason may be due to the nature of incidental vocabulary acquisition. As Nagy, Herman, and Anderson (1985) demonstrated, increases in word knowledge each time a reader sees a novel word are very small (around 10-15%). When measured in an experimental setting, then, the incidental gains for a set of target words on the post-test may seem negligible. Simply comparing the *absolute* number of words gained in a given period of instruction, without calculating the *rate* of acquisition, has led researchers to conclude that direct instruction of vocabulary "works" better than incidental acquisition. Once we correct for the time spent on each condition, however, it becomes clear that the opposite is true, as found in the studies reviewed here.

None of the studies reviewed here measured the affective impact of the pre-reading, during-

reading, and post-reading forms of direct instruction on young children.Krashen (2013) points out in his analysis of storybook "interruptions" (questioning, pointing out features of print, giving definitions) that there are possible negative effects when attempts are made "improve" the efficacy of storybook reading through explicit instruction. Biemiller and Boote (2006) provide some evidence of this. During their storybook reading experiment with kindergartners and 1st graders, they point out that "1 or more children expressed complaints about interruptions for explaining word meanings" when the story was read to them the first time (p. 48).

The results of this analysis do not mean that teachers should *withhold* explanations of words from children during storybook reading, especially when the children ask for them. That would be annoying for the children, even disrespectful. None of the studies included in Wasik et al.'s review, however, looked at the effects of explaining words that the children themselves asked about.

Direct instruction in vocabulary is less efficient for word acquisition than simply reading, results in lower retention of the target words, is more work for the teacher, and is likely to provide a less enjoyable experience for the children it is supposed to benefit. It is difficult to see how any of these characteristics would recommend the practice to parents and teachers.

Endnotes

[1] The title of this article is an adaptation of a line from the movie, *Treasure of the Sierra Madre* (Blanke & Huston, 1948): "We don't need to stinkin' badges."

[2] Wasik and Bond (2001) claimed that their experimental and reading-only comparison groups spent "a similar amount of time" (p. 245) on storybook reading, but the description of the comparison and intervention conditions suggests otherwise. Although comparison teachers were given the same books and asked to read them to their children the same number of times as the intervention group, there was no measure of how long this took. Teachers in the intervention group not only read the story, but also introduced the vocabulary to students before reading, interrupted the reading to ask questions, and did activities related to the target words after the reading, all of which would take more time than merely reading the books to the children. In any case, no total times were provided by Wasik and Bond for either condition.

[3] Beck and McKeown said that they did not prescribe the amount of time teachers should spend on the activities, since the instruction was not "rote": "For example, some activities might produce longer discussions, or students might spend more time recalling a certain word's definition or generating an associated word or definition" (p. 528). Oddly, the researchers did tape record the teaching sessions to check for treatment fidelity (p. 525), but did not analyze the data in order to calculate an accurate assessment of time spent in each condition.

References

Beck, I., & McKeown, M. (2007). Increasing young low-income children's oral vocabulary repertoires through rich and focused instruction. *The Elementary School Journal*, *107*(3), 251-271.

Biemiller, A., & Boote, C. (2006). An effective method for building meaning vocabulary in primary grades. *Journal of Educational Psychology*, *98*(1), 44-62.

Blanke, H, P. P. (Producer), & Huston, J. (Director). (1948). *Treasure of the Sierra Madre* [Motion picture]. United States: Warner Brothers.

Carey, S., & Bartlett, E. (1978). Acquiring a single new word. *Proceedings of the Stanford Child Language Conference*, *15*, 17–29.

Coyne, M., McCoach, D., & Kapp, S. (2007). Vocabulary intervention for kindergarten students: Comparing extended instruction to embedded instruction and incidental exposure. *Learning Disability Quarterly*, *30*(2), 74-88.

Coyne, M., McCoach, D., Loftus, S., Zipoli Jr, R., &Kapp, S. (2009). Direct vocabulary instruction in kindergarten: Teaching for breadth versus depth. *The Elementary School Journal*, *110*(1), 1-18.

Coyne, M., McCoach, D., Loftus, S., Zipoli Jr, R., Ruby, M., Crevecoeur, Y., & Kapp, S. (2010). Direct and extended vocabulary instruction in kindergarten: Investigating transfer effects. *Journal of Research on Educational Effectiveness*, *3*(2), 93-120.

Coyne, M., Simmons, D., Kame'enui, E., & Stoolmiller, M. (2004). Teaching reading during shared storybook readings: An examination of differential effects. *Exceptionality, 12*(3), 145-162.

Gonzalez, J., Pollard-Durodola, S., Simmons, D., Taylor, A., Davis, M., Kim, M., & Simmons, L. (2011). Developing low-income preschoolers' social studies and science vocabulary knowledge through content-focused shared book reading. *Journal of Research on Educational Effectiveness, 4*, 25-52.

Krashen, S. (1989). We acquire vocabulary and spelling by reading: Additional evidence for the input hypothesis. *The Modern Language Journal*, *73*(4), 440-464.

Krashen, S. (1999). *Three arguments against whole language & why they are wrong*. Portsmouth, NH: Heinemann.

Krashen, S. (2003). *Explorations in language acquisition and use: The Taipei lectures*. Portsmouth, NH: Heinemann.

Krashen, S. (2013). "Read-alouds: Let's stick to the story." *Language and Language Teaching* (Azim Premji University and the Vidya Bhawan Society), *3*, 1-7.

Leung, C. (2008). Preschoolers' acquisition of scientific vocabulary through repeated read-aloud events, retellings, and hands-on science activities. *Reading Psychology, 29*, 165-193.

Loftus-Rattan, S., Mitchell, A., & Coyne, M. (2016). Direct vocabulary instruction in preschool: A comparison of extended instruction, embedded instruction, and incidental exposure. *The Elementary School Journal*, *116*(3), 391-410.

Loftus, S., Coyne, M., McCoach, D., Zipoli, R., & Pullen, P. (2010). Effects of a supplemental vocabulary intervention on the word knowledge of kindergarten students at risk for language and literacy difficulties. *Learning Disabilities Research & Practice*, *25*(3), 124-136.

Mason, B. (2007). "The efficiency of self-selected reading and hearing stories on adult second language acquisition." *Selected papers from the sixteenth international symposium on English Teaching,* (pp. 630-655). Tapei: English Teachers' Association.

Mason, B., & Krashen, S. (2004). Is form-focused vocabulary instruction worthwhile? *RELC Journal, 35*(2), 179-185.

Mason, B., Vanata, M., Jander, K., Borsch, R., & Krashen, S. (2008). The effects and efficiency of hearing stories on vocabulary acquisition by students of German as a second foreign language in Japan. *Indonesian JELT*, *5*(1), 1-14.

McKeown, M., & Beck, I. (2014). Effects of vocabulary instruction on measures of language processing: Comparing two approaches. *Early Childhood Research Quarterly, 29*, 520-530.

McQuillan, J. (2016). Time, Texts, and Teaching in Vocabulary Acquisition: A Rebuttal to Cobb (2016). *Reading in a Foreign Language*, *28*(2), 307-318.

Mol, S., & Bus, A. (2011). To read or not to read: a meta-analysis of print exposure from infancy to early adulthood. *Psychological Bulletin*, *137*(2), 267-296.

Nagy, W., Herman, P., & Anderson, R.C. (1985). Learning words from context. *Reading Research Quarterly, 20*(2), 233-253.

Robbins, C., & Ehri, L. C. (1994). Reading storybooks to kindergartners helps them learn new vocabulary words. *Journal of Educational Psychology*, *86*(1), 54-64.

Silverman, R., Crandell, J. D., & Carlis, L. (2013). Read alouds and beyond: The effects of read aloud extension activities on vocabulary in Head Start classrooms. *Early Education & Development*, *24*(2), 98-122.

Smith, F. (2004). *Understanding reading*. 6th edition. New York: Routledge.

Stanovich, K. (1982). Individual differences in cognitive processes of reading: II. Text-level process. *Journal of Learning Disabilities, 15*(9), 549-554.

Wasik, B., & Bond, M. (2001). Beyond the pages of a book: Interactive book reading and language development in preschool classrooms. *Journal of Educational Psychology*, *93*(2), 243-250.

Wasik, B., Bond, M., &Hindman, A. (2006). The effects of a language and literacy intervention on Head Start children and teachers. *Journal of Educational Psychology*, *98*(1), 63-73.

Wasik, B., Hindman, A. & Snell, E. (2016). Book reading and vocabulary development: A systematic review. *Early Childhood Research Quarterly*, *37*, 39-57.

Weisberg, D., Ilgaz, H., Hirsh-Pasek, K., Golinkoff, R., Nicolopoulou, A., & Dickinson, D. (2015). Shovels and swords: How realistic and fantastical themes affect children's word learning. *Cognitive Development, 35*, 1-14.

West, R., & Stanovich, K. (1978). Automatic contextual facilitation in readers of three ages. *Child Development, 49*, 717-727.

Zipoli Jr, R. P., Coyne, M. D., & McCoach, D. B. (2011). Enhancing vocabulary intervention for kindergarten students: Strategic integration of semantically related and embedded word review. *Remedial and Special Education*, *32*(2), 131-143.

Zucker, T., Solari, E., Landry, S. & Swank, P. (2013). Effects of a brief tiered language intervention for prekindergartners at risk. *Early Education & Development*, *24*(3), 366-392.

Jeff McQuillan worked at the School of Education at California State University, Fullerton and American Language School at the University of Southern California. He is a Senior Research Associate at the Center for Educational Development in Los Angeles, California.He has published widely in the areas of literacy development, first and second language acquisition, and bilingualism.

titleman@gmail.com