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Reading Storybooks to Kindergartners Helps Them Learn New Vocabulary Words

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In sessions conducted individually, kindergartners who were nonreaders listened to an adult read the same storybook twice, 2–4 days apart, and then completed a posttest measuring their knowledge of the meanings of 22 unfamiliar words, half of which had appeared in the story. Some target words occurred twice in the story and some only once, so children heard some words four times and some words twice. Children recognized the meanings of significantly more words from the story than words not in the story, thus indicating that storybook reading was effective for building vocabulary. Gains were greater among children with larger entering vocabularies. Four exposures to words appeared to be necessary but not sufficient for higher rates of word learning. Findings confirm that story listening contributes modestly to young children's vocabulary growth.

The vocabulary growth occurring in elementary school children is substantial and significant and has received attention from a number of researchers (Anderson & Freebody, 1981; Beck, Perfetti, & McKeown, 1982; Becker, 1977; Calfee & Drum, 1986; Chall, 1987; Graves, 1986; McKeown & Curtis, 1987). Estimates of both average vocabulary size and yearly growth vary considerably (Dale, 1965; Joss, 1964; Lorge & Chall, 1963; Nagy & Anderson, 1984; Rinsland, 1945; M. E. Smith, 1926; M. K. Smith, 1941; Templin, 1957). However, all studies show that children continue to acquire new words beyond the initial language acquisition years and that children's vocabularies grow by thousands of words each year during the elementary school years. Moreover, vocabulary size is strongly correlated with children's overall school achievement (Wells, 1986). Because vocabulary plays an important role in both communication effectiveness and academic success, it is important to understand how young children achieve their vocabulary growth.

According to Werner and Kaplan (1950a, 1950b), children learn the meanings of words under two conditions: (a) through direct and explicit reference by adults when they name objects or define words and (b) through incidental encounters with words in verbal contexts. Incidental encounters include hearing words in conversations, on television, and in stories. In these situations, word meanings may not be expressed or accessible. Therefore, children who encounter new words incidentally must use indirect contextual and implicit information to discern meanings.

Sternberg (1987) and Sternberg and Powell (1983) delineated factors that affect the learning of new words from incidental encounters in verbal contexts. Learning from context is influenced by the number of occurrences of the unknown word, the concreteness of the word, the helpfulness of the surrounding context, and the importance of the unknown word for understanding the surrounding context. It is also influenced by individual differences in the abilities to separate relevant information from irrelevant information; to combine selected information to form a cohesive, plausible whole; and to relate new information to previous knowledge. Thus, both the specific contexts of words and individual abilities are thought to contribute to the incidental learning of new words.

Before the age of 2 years, children seem to learn new words more easily from social interaction and direct references than from indirect sources. Vocabulary growth before age 2 years is positively correlated with social interactions but not with television viewing (Nelson, 1973). In contrast, children aged 3–5 years can acquire new words from television (Rice & Woodsmall, 1988; Sachs & Johnson, 1976). Thus, by the time children enter elementary school, they can effectively use both direct and indirect references to learn new words.

There are various ways that school children increase their vocabularies. One is from direct instruction in the classroom. However, studies indicate that direct instruction does not account for much of the vocabulary growth displayed by school children (Jenkins & Dixon, 1983). For example, Durkin (1979) found that in Grades 3–6 a very small percentage of classroom time (0.4% to 1.0%) was spent on direct vocabulary instruction. In one study of intensive vocabulary training, 27 fourth graders realized an average gain of only 85 targeted words in 19 weeks (Beck et al., 1982). This gain is far short of the estimated 1,000–3,000 words that children are known to acquire in that length of time (Joss, 1964; Nagy & Anderson, 1984).

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Because classroom instruction does not account for vocabulary growth, school-age children must learn much of their vocabulary incidentally from verbal contexts. Studies by Jenkins, Stein, and Wysocki (1984); Nagy, Anderson, and Herman (1987); and Nagy, Herman, and Anderson (1985) have indicated that children do learn vocabulary incidentally from texts during Grades 3–8. Nagy et al. (1987) have concluded that an average amount of reading probably accounts for one third of a child's annual vocabulary growth and that regular, wide reading can result in substantial and permanent vocabulary growth.

Before third grade, however, it is unlikely that children increase their vocabularies substantially through reading because they encounter few if any unfamiliar words in the books they are required to read at school. Their oral language is more advanced than the vocabularies found in these books because only the most frequent words are used to construct primary-grade reading materials (Clifford, 1978; Strickland, 1971).

On the other hand, children do learn new vocabulary while listening to stories. Wells (1986) found that the frequency with which children heard stories was positively associated with their teachers' assessments of their vocabulary size at age 10 years. Elley (1989) reported that 7- and 8-year-olds who heard the same stories three times in their classrooms demonstrated some gain in identifying the correct meanings of target words on a multiple-choice test. This gain increased significantly when the teacher discussed the target words during the reading. Similarly, studies by Feitelson, Kita, and Goldstein (1986) and Eller, Pappas, and Brown (1988) showed that kindergartners' and first-graders' vocabularies could be augmented by listening to stories. In the Elley, Feitelson et al., and Eller et al. studies, children demonstrated some ability to use newly acquired words in other tasks.

Although supportive of the influence of story listening on vocabulary growth, the conclusions that can be drawn from these studies are limited. In the Feitelson et al. (1986) study, inspection of their observational records revealed that teachers mediated story readings by reviewing the meanings of words that they thought first graders might not know. Thus, children may have learned new words not from listening to stories but rather from attending to discussions of the unfamiliar words.

In the Eller et al. (1988) study, after subjects listened to the same stories several times, each child was asked to read the stories aloud. Because the children were nonreaders, they "pretend read" the stories by turning pages and recalling the stories from memory. In their tellings, the children were observed to use the language of the stories including words considered unusual in kindergartners' discourse. This was taken as evidence by Eller et al. that the children had acquired new vocabulary from listening to the stories. However, it may be that these children memorized and repeated the text that they heard without knowing what the novel words meant. Children who use unfamiliar words appropriately in their pretend reading of a familiar story are not necessarily exhibiting productive vocabulary knowledge. Eller et al. did not demonstrate that kindergartners could use the novel words in other situations. Moreover, neither Feitelson et al. (1986) nor Eller et al. showed that young children could identify the meanings of the novel words they heard in stories. Thus, conclusions about story reading as a direct cause of vocabulary growth remain tentative in these studies.

Leung and Pikulski (1990) studied whether kindergartners and first graders could identify the meanings of novel words that they heard in stories. They replicated the Eller et al. (1988) study by using the same two picture storybooks, but they used a pretest–posttest design that included controls who did not hear the storybooks. After hearing each story, subjects from the experimental group were asked to pretend read the books. In addition, both experimental and control subjects were asked to tell the meanings of 20 target words from the stories before and after the experimental treatment. Results support Eller et al.'s finding that repeated exposure to stories increased children's use of target words in their pretend readings. However, there was no significant difference between the experimental and control groups in vocabulary gain as evidenced by subjects' ability to verbally define the target words. Leung and Pikulski suggested that vocabulary gains might have been demonstrated if the design had used a multiple-choice test of word meanings.

The purpose of our study was to extend this line of research regarding the effects of listening to stories on children's vocabulary growth. Kindergartners listened to a story twice and then completed a multiple-choice vocabulary test assessing their knowledge of 11 unfamiliar target words occurring in the story. Comparable words not appearing in the story were included as controls in the test. Some target words appeared twice in the story and some only once. Children's entering vocabulary knowledge was assessed with the Peabody Picture Vocabulary Test—Revised (PPVT–R; Dunn & Dunn, 1981). Of interest was whether exposure to the target words in stories would improve children's knowledge of the words over that of control words, whether the number of exposures to words would influence learning, and whether children's entering vocabulary knowledge would influence gains. Our aim was to verify results of the study by Elley (1989) in which children with weak vocabularies exhibited greater gains. Our concern with Elley's results was that a ceiling effect may have suppressed gains in children with larger vocabularies.

Method

Subjects

Fifty-one native English-speaking kindergartners drawn from several classrooms in a middle- to lower-middle-class public elementary school received parental consent to participate in the study. All were nonreaders in the opinion of their teachers. Nonreaders were selected to ensure that any gains in vocabulary knowledge could be attributed to the experience of hearing the words in a story, not to seeing the words in print.

To ensure that subjects were not familiar with our stories and to verify that they were nonreaders, children were shown the original texts and were asked if they had ever heard the stories and if they could tell us what happened. Also, they were shown the first pages of *The Boy Who Cried Wolf* (Littledale, 1975) and were asked to read the words. Four children who exhibited familiarity with one of the stories and two who read the pages they were shown were dropped from the sample.

The remaining 45 children were administered Form M of the PPVT–R. Scores were used to exclude children with extremely poor vocabularies who might have difficulty understanding the stories because too many words would be unfamiliar and to exclude children with extremely rich vocabularies who might already know the meanings of our target words. Only those children whose PPVT–R standard scores were within one standard deviation below the mean or two standard deviations above the mean on the PPVT–R were included in the sample. Seven children were eliminated by this procedure.

The 38 remaining children were separated into three ability groups on the basis of their PPVT–R standard scores: low (85 to 99), middle (100 to 114), and high (115 to 130). Children in each PPVT–R ability group were randomly assigned to hear either *A Crocodile's Tale* (Aruego & Aruego (Dewey), 1972) or *The Boy Who Cried Wolf* (Littledale, 1975). Four of these students were dismissed because of absences, and one was dropped because of faulty testing. Thus, 33 children (12 girls and 21 boys) comprised the final sample. Characteristics of groups who heard *A Crocodile's Tale* and *The Boy Who Cried Wolf* are given in Table 1.

Materials

Texts and target words. *The Boy Who Cried Wolf* and *A Crocodile's Tale* were edited so that each had approximately 680 words and a Grade 2 readability level according to the Fry Readability Formula (Fry, 1968, 1977). (See stories in Appendix A.) Eleven target words thought to be unfamiliar to kindergartners were substituted for familiar words or phrases in each story. The target words from one story did not occur in the other story. Eight of the targets occurred twice in a story, and 3 occurred once. (Word repetition was determined by story constraints rather than by random assignment.) The target words for each story included 1 noun, 2 adjectives, and 8 verbs. The length of the target words for each story averaged two syllables. No target word had more than three syllables. The target words were not directly defined in the story, but most were easily comprehended from clues in the surrounding text. The two revised stories were printed in book form with black and white illustrations.

Four factors led us to believe that the target words were unfamiliar to the kindergartners. Frequency counts by Carroll, Davies, and Richman (1971) and by Thorndike and Lorge (1944) indicated that all were low-frequency words in children's literature (less than 85 per million). According to analyses by Hall, Nagy, and Linn (1984), these words occur with very low frequency in conversations involving five-year-old children. Eight teachers in day care centers and primary schools agreed that kindergartners rarely, if ever, hear these words. In a vocabulary recognition test requiring students to say whether each word was familiar and if so to tell about the word, performances of 12 kindergartners and first graders not used in the study confirmed that the 22 target words were largely unfamiliar.

To ensure that contexts were sufficiently helpful for clarifying meanings of target words, we revised those that were considered too subtle by three adult judges. Then the texts were modified so that pseudowords replaced the target words. Twelve college undergraduates read the texts and guessed the meanings of the 22 pseudowords. Most of the pseudoword substitutes for target words (all but the substitute for *hideous*) were defined correctly by at least 70% of the undergraduates, thus verifying that the contexts were informative.

Multiple-choice posttest. A posttest-only design was used because a pretest would have alerted children to the target vocabulary before they listened to the story. Subjects were tested on 22 target words, 11 from the story they heard and 11 from the story they did not hear. The multiple-choice vocabulary test was presented as a detective game. For each word there were four picture choices and a "don't know" option. First, the researcher described each picture (e.g., for Picture 3, "A man asks a person a question") and then used a "Kermit the Frog" puppet to designate the picture depicting the target word (e.g., "I see a man *query* a person."). Subjects pointed to the picture that matched the puppet's description. They were told to respond "I don't know" if unable to choose a picture (see Appendix B).

Several precautions were taken to assure unbiased results. The order of the 22 target words and the positions of the correct answers were determined randomly. The four pictures for each target verb featured the same-sex character so that the clue was applicable to any of the pictures. The puppet praised all responses, both correct and incorrect, and gave additional encouragement ("I'm glad you're playing this game with me.") at specified test points. Two practice items preceded the target word items.

Table 1
Comparison of Two Story Groups

Characteristic	Story group: Crocodile	Wolf
Number (boys, girls)	17 (10, 7)	16 (11, 5)
Mean age (*SD*) in months	73.53 (4.60)	73.75 (6.12)
Mean standardized PPVT–R (*SD*)	105 (11.25)	104 (9.56)
Number per low, medium, high PPVT–R category	6, 8, 3	6, 8, 2
Average number of words[a] correctly defined		
Heard in story (*SD*)	4.00 (2.18)	4.81 (1.76)
Not heard in story (*SD*)	3.00 (1.54)	3.31 (.95)

Note. PPVT–R = Form M of the Peabody Picture Vocabulary Test—Revised.
[a] Maximum = 11 words.

Procedure

A counterbalanced treatment, posttest-only design was used (Campbell & Stanley, 1963). Children were examined individually. Each child listened to one story containing 11 target words. The story was heard on two occasions, from two to four days apart. Each child sat to the left of the experimenter and observed the text and illustrations as the experimenter read. No word meanings were discussed. However, the story was briefly discussed. After the first reading, children were asked what they liked about the story. After the second reading, they described something that happened in the story and then were asked, "Did you like the story a lot, a little, or not very much?" Then the multiple-choice vocabulary test was administered.

Results

Correlation coefficients showed that the number of days intervening between the first and second story readings did not affect performance on the vocabulary posttest (r = .01), so this factor was ignored.

Table 2
Means, Standard Deviations, and Partial Correlations Between Variables With Effects of Story Removed

Variable	Sex	Age	PPVT–R	Heard	Not heard	*M*	*SD*
Age (mo)	.17					73.64	5.48
PPVT–R	−.03	−.04				104.49	10.31
Heard	.03	.28	.52**			4.39	2.00
Not heard	−.07	.08	.42*	.46**		3.15	1.28
Average[a]	.01	.24	.55***	.91***	.78***	3.74	1.37

Note. PPVT–R = Form M of the Peabody Picture Vocabulary Test—Revised. $N = 33$.
[a] Average mean of words-heard scores and mean of words-not-heard scores as used in Cohen and Cohen's (1983) regression analysis.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Correlations between age, PPVT–R, and performance on target words are presented in Table 2. These are partial correlations with the effects of story removed. From Table 2, it is apparent that children's entering vocabulary knowledge (PPVT–R scores) was related to their performance on the vocabulary posttest measuring what they knew about target words in the stories. The moderate correlation of PPVT–R with words not heard in stories shows that children with better vocabularies knew more of the target words. However, mean performance on the words not heard ($M = 3.15$ correct) was not much above chance on the multiple four-choice test (chance = 2.75 correct out of 11 maximum).[1] Scores on the words not heard ranged from 0 to 6 (maximum correct = 11), with 88% of the subjects responding correctly to no more than 4 items. This indicates that most of the target words were unfamiliar to most subjects and that there was plenty of room for growth from exposure to the words in stories.

Posttest vocabulary scores were analyzed using the repeated-measures version of Cohen and Cohen's (1983) multiple regression–correlation analysis. The repeated measure had two levels: (a) the number of words correctly defined from the list of words heard in a story and (b) the number of words correctly defined from the list of words not heard in a story. Table 3 presents the results of the regression analyses including the test statistics.[2]

Table 3
Regression Analysis of Performance on Multiple Choice Vocabulary Test

Variable and step	R^2 increment	*F*	*p*
Between subjects			
Sex and age ($df = 2$)	0.044	1.037	*ns*
Story[a]	0.035	1.650	*ns*
PPVT–R	0.306	14.429	<.001
Between-subjects mean square error ($df = 29$)	0.615		
Within subjects			
Heard–not heard	0.124	29.258	<.001
Sex, age, story, and PPVT–R ($df = 4$)	0.253	—	—
Heard–not heard × Sex, Age ($df = 2$)	0.017	2.006	*ns*
Heard–not heard × Story	0.004	0.944	*ns*
Heard–not heard × PPVT–R[b]	0.020	4.719	<.05
Within-subjects mean square error ($df = 57$)	0.242		

Note. PPVT–R = Form M of the Peabody Picture Vocabulary Test—Revised. Dashes indicate data that were not available.
[a] Crocodile or wolf story. [b] These variables were entered for control purposes. The *F* values are of no interest.

In Cohen and Cohen's (1983) hierarchical regression procedure, between-subjects effects (i.e., sex, age, story group, and PPVT–R standard scores) are analyzed using the average of the repeated measures scores as the dependent variable. The four independent variables were entered into the regression equation in the following three-step sequence: (a) sex and age as a set; (b) story group (crocodile vs. wolf); and (c) subjects' standard scores on the PPVT–R. The sex and age combination failed to account for a statistically significant portion of the variance. Story group also was not a significant factor, indicating that words from one story were not better recognized than words from the other story. However, PPVT–R standard scores did yield a statistically significant increment in explained variance even with age already in the equation. The PPVT–R factor accounted for 31% of the between-subjects variance. These results indicate that subjects with higher PPVT–R standard scores recognized more correct definitions of words than did subjects with lower PPVT–R standard scores.

In Cohen and Cohen's (1983) treatment of repeated-measures designs, within-subjects factors are evaluated by creating a new data file in which there is a unique record for

[1] In addition to the four choices, subjects were offered a "don't know" response option. However, only 4 subjects used this option, and altogether these subjects applied it to eight words, six times to words not heard and twice to words heard. This indicates that most subjects guessed rather than said, "I don't know." Therefore, chance level is an appropriate concept here.

[2] A regression analysis was preferred to an analysis of variance (ANOVA) because the former analysis allowed us to assess effects of age and Peabody Picture Vocabulary Test—Revised (PPVT–R) score as continuous variables. Also a regression analysis was better suited for assessing gender effects with unequal numbers of male and female subjects. We performed an ANOVA and got the same results but without considering effects of age and sex and with treating vocabulary (PPVT–R scores) as an independent variable with three levels.

each repeated measure score. Because there were two scores for each subject (i.e., a score for the words heard in the story and a score for the words not heard), each subject contributed two records. A new variable, heard–not heard, was created to demarcate those records representing the score on the words heard from those records representing the score on the words not heard. With these new data, hierarchical regression can proceed in the normal fashion. However, because the computer program treats all the data as if they are from different subjects, the F-values generated by the program are erroneous and must be recalculated to correct for the between-subjects variance revealed during the analyses of between-subjects effects. Exact procedures and formulas can be found in Cohen and Cohen (Chapter 11).

To examine whether subjects' performance on the words heard in the story reliably exceeded their performance on the words not heard, we entered the repeated measures factor, heard–not heard in the first step of the within-subjects analysis. This factor was found to be highly significant statistically, thus accounting for 19% of the within-subjects variance (see Table 3). This indicates that listening to stories was an effective means of expanding subjects' word knowledge.

This finding was evidenced not only by statistical tests but also by the comments of several children who mentioned during the vocabulary posttest that they had heard one or another target word in the story. For example, one child said, "I recognize that word pretty much from the monkey in the story." Two others remarked about the word *clamor*. One said, "You said *clamor* on *The Boy Said Wolf*." Another said, "I heard that word the first time I came."

Subsequent steps in the regression analysis examined whether sex, age, story group, or PPVT–R standard score influenced the size of the difference in performance between words heard and words not heard. Sex, age, story group, and PPVT–R standard score were entered together in Step 2 as necessary controls before entering the interaction variables. The interactions between heard–not heard and sex and between heard–not heard and age were entered in the third step. This step did not yield a statistically significant increase in the proportion of explained variance. Similarly, the interaction between heard–not heard and story group, entered as Step 4, was not significant. The interaction between heard–not heard and PPVT–R standard score, entered as Step 5, did attain statistical significance, however, and it accounted for 3% of the within-subjects effect (see Table 3). This indicates that the size of the difference between performances on the two lists varied as a function of PPVT–R scores.

To clarify this interaction, we divided subjects into three vocabulary groups (n = 11 subjects per group) according to their PPVT–R standard scores: range of scores = 128–109 (high), 107–99 (middle), and 99–86 (low). Performances of the three groups in defining words heard and words not heard in the stories are plotted in Figure 1 where it is apparent that heard versus not heard differences became much larger as PPVT–R standard scores increased. These results differ from Elley's (1989) results and indicate that children who possess larger vocabularies make greater gains in vocabulary growth than do children with smaller vocabularies when they are exposed to unfamiliar words in stories.

Because the vocabulary posttest was a multiple four-choice test, subjects could be expected to correctly identify 2.75 words in the heard and not-heard sets by chance alone (but see Footnote 1). Inspection of the distribution of scores revealed that many more of the not-heard scores were close to chance: 64% of the not heard versus 30% of the heard scores were $\leq$ 3 correct. This indicates that the target words were unfamiliar to most subjects and that exposure to the words boosted scores above chance. Interestingly, of the 10 subjects who were exposed to words in stories yet who performed close to chance on these words (i.e., the 30% group above), 80% had poor vocabularies (i.e., PPVT–R $\leq$ 100). In contrast, of the 21 subjects who did not hear the target words and who performed close to chance (i.e., the 64% group above), 48% had poor vocabularies (i.e., PPVT–R $\leq$

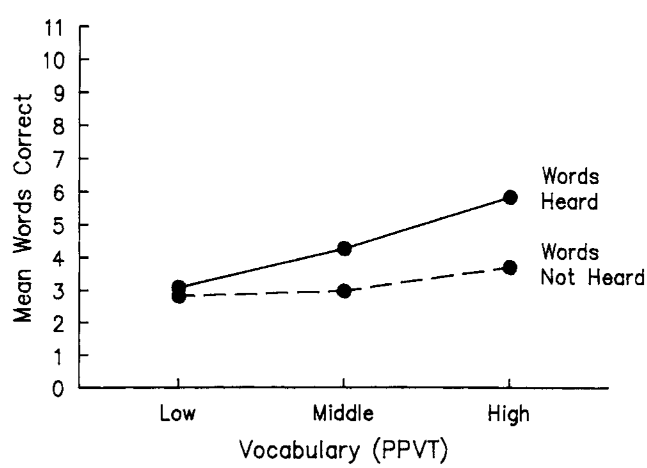

Figure 1. Mean number of word meanings correctly selected by kindergartners on the posttest as a function of word exposure (i.e., words heard vs. not heard in stories) and level of vocabulary knowledge on Form M of the Peabody Picture Vocabulary Test—Revised (PPVT–R; i.e., low, middle, high).

100). These findings indicate that 80% was an exceptional value, and they confirm the relationship between children's entering vocabularies and their likelihood of learning word meanings from text.

To examine the impact of exposure to words on their ease of learning for particular words and word classes, we calculated the probability of learning a word from context as defined by Nagy et al. (1985, 1987) for each target word and for various classifications of the words. Probability of learning from context represented the degree to which vocabulary performance increased (positive value) or decreased (negative value) when words were heard relative to when they were not heard in stories.[3] Table 4 presents findings for specific words and for categories including story and form class. Specific words are ordered from high to low in terms of learning probability values. Inspection of the list reveals that all of the words learned most easily (i.e., probability values between .22 and .65 at the top of the list) were heard four times by subjects. Words heard only two times (as well as several words that were heard four times) had lower learning probabilities (i.e., below .19). This suggests that hearing words four times in stories may be necessary but not sufficient for establishing higher rates of acquisition.

Table 4
List of Target Words in Stories, Number of Occurrences, and Probability of Learning

Target word	Number of occurrences[a]	Probability of learning[b]
All 22 words	3.4	.16
16 verbs	3.4	.16
4 adjectives	3.5	.21
2 nouns	4.0	.11
11 Croc. words	3.4	.09
11 Wolf words	3.4	.16
Specific words[c]		
Irate (adj., Wolf)[d]	4.0	.65
Duped (verb, Wolf)	4.0	.47
Clamor (verb, Wolf)	4.0	.43
Chortle (verb, Wolf)	4.0	.42
Extricate (verb, Croc.)	4.0	.42
Escorted (verb, Wolf)	4.0	.29
Query (verb, Croc.)	4.0	.22
Survey (verb, Wolf)[d]	2.0	.18
Lament (verb, Croc.)	2.0	.18
Marge (noun, Croc.)[d]	4.0	.18
Toting (verb, Wolf)[d]	2.0	.15
Audible (adj., Croc.)	4.0	.14
Procure (verb, Croc.)	2.0	.12
Abode (noun, Wolf)[d]	4.0	.02
Angle (verb, Wolf)	4.0	.01
Decrepit (adj., Croc.)[d]	4.0	−.01
Hideous (adj., Wolf)	2.0	−.06
Consume (verb, Croc.)[d]	4.0	−.08
Strode (verb, Wolf)	4.0	−.17
Divulge (verb, Croc.)	2.0	−.18
Discard (verb, Croc.)[d]	4.0	−.25
Snared (verb, Croc.)	4.0	−.41

[a] Numbers represent occurrences for two readings of the story. Means are calculated for categories of words. [b] Probability of learning a word from context is defined as (heard–not heard)/(1 − not heard) where heard and not heard are the proportions of subjects scoring correctly on the multiple-choice posttest who heard or did not hear the words in a story. [c] Information in parentheses refers to form class (verb, adjective [adj.], noun) and story where word occurred (Wolf, Crocodile [Croc.]). [d] These words were illustrated in the stories.

Sizeable negative learning probabilities were obtained for a few words (see Table 4). Causes remain unclear. Stories might have misled subjects about these meanings, or by chance subjects not hearing the words in stories may have been more knowledgeable about their meanings than subjects hearing the words. Schatz and Baldwin (1986) discuss several reasons why contexts might impair the learning of word meanings.

Although it appears from Table 4 that verbs and adjectives were learned more easily than nouns, there were too few instances of adjectives and nouns to permit any generalizations. Glancing down the table reveals that verbs dominated both the top and the bottom of the list in terms of learning probabilities. Such variability combined with the small number of items precludes comparisons regarding the learnability of the three form classes.

Correlations were calculated between learning probability values and three other aspects of the target words: clarity of the context (i.e., the proportion of adults who were able to define pseudowords that were substituted for the 22 target words in the stories; M = 87.5% of the words correctly defined, skewed distribution ranging from 40% to 100%, with 9 words at 100%); whether or not the words were depicted in the illustrations included in the book (the 8 words marked by superscript d in Table 4 were pictured, the remaining 14 words were not); and number of syllables in the words. None of the correlations was statistically greater than zero (all ps > .05).

Discussion

Results of this experiment support the hypothesis that kindergartners expand their recognition vocabularies when they listen to stories at least twice and hear unfamiliar words repeated in the stories. This finding supports and extends the findings of other research on vocabulary acquisition from stories (Elley, 1989; Jenkins et al., 1984; Leung & Pikulski, 1990; Nagy et al., 1985; 1987). Nagy et al. (1987) found that children aged 8 years and older learn vocabulary from their own silent reading, and they suggested that younger children should learn vocabulary from listening to stories. Elley (1989) found that 7- and 8-year-old children learn vocabulary from listening to stories. The present study showed that 5- and 6-year-old nonreading kindergartners can acquire new vocabulary from listening to stories. Vocabulary effects were detected with a multiple-choice test, thus supporting the recommendation of Leung and Pikulski that this type of test is

[3] The calculation was (heard minus not heard) divided by (1 minus not heard), where heard was the proportion or mean proportion of correct responses when the word(s) were heard, and not heard was the proportion or mean proportion of correct responses when the word(s) were not heard. Means were used to compute proportions for classes of words.

more sensitive than the type they used requiring subjects to tell the meanings of target words.

One feature of our study that might be perceived as a weakness is the absence of a delayed posttest. However, Elley (1989) found only a 2–3% decline in performance from the immediate to the delayed posttest. It is likely that our findings would persist over time as well.

In the present study, prior vocabulary knowledge was the only subject-related variable to significantly affect vocabulary growth from listening to stories. Children with larger vocabularies learned more words than children with smaller vocabularies. This finding is discrepant with Elley's (1989) results. He divided subjects into four ability groups that were based on vocabulary pretest scores and calculated the percentage gain from pretest to posttest for each group. Subjects in his lowest group exhibited the highest percentage gain, whereas subjects in the other three ability groups exhibited about the same gain. However, differences between groups were not tested statistically, and a ceiling effect may have suppressed scores in the higher ability groups.

Our finding provides one more example of the Matthew effect, that is, the idea that the rich get richer while the poor get poorer (Stanovich, 1986). Applied to vocabulary growth, this means that as children get older, the gap between those with sizeable vocabularies and those with small vocabularies grows larger and larger.

Why should vocabulary size influence how easily children learn the meanings of new words from context? Sternberg and Powell (1983) suggest that the causal relationship is bidirectional. Students who are more skilled at using context cues are those who comprehend text well and have a rich knowledge base so that they are better able to infer the meanings of unfamiliar words. Likewise, students who have more elaborate knowledge of words and their definitions can construct richer semantic representations of text. Present findings support this relationship. Children with larger existing vocabularies were better able to use contextual clues to learn more new vocabulary words.

Not only vocabulary size but also other factors may partially explain why children with smaller vocabularies learned fewer new words. Perhaps these children were less experienced in listening to stories and therefore attended to the overall plot rather than to new words. Or perhaps they were less interested in or motivated to learn new words. Perhaps some aspect of intelligence other than vocabulary may have been responsible, such as short- or long-term memory deficits.

Although vocabulary growth was statistically significant, the effect size was modest. The heard–not heard main effect accounted for 19% of the within-subjects variance, and the mean gain from hearing words in stories was 1.24 words or 16% of the maximum gain possible. Listening to stories might have promoted greater vocabulary growth if more of the words had been heard at least four times and if target words had been better gauged to prior vocabulary level. The fact that subjects scored close to chance level on the words *not heard in stories* suggests that most of the words were difficult.

Nevertheless, our modest gains are consistent with those in other studies (Elley, 1989; Nagy et al., 1985; 1987). Nagy et al. (1987) found that children who read difficult words in a text knew 3.3% more of these words than those who had not read the texts. Elley (1989) reported gains of 15% for 7- and 8-year-old children who heard words in stories. In our study, subjects who heard words knew 11.3% more of the words than those who had not. It should be noted that some researchers consider percentage estimates highly dubious because they depend so much on the criteria for knowing a word and on the nature of the cues in the relevant texts, thus limiting conclusions about the extent of general vocabulary growth that can be expected from listening to stories.

One possible reason why contexts facilitated vocabulary growth to the extent that they did in the present study is that we were careful to ensure that contexts clarified the meanings of our target words. This was done by verifying that pseudowords substituted for the target words could be defined correctly by adults who were administered this task. Because authors of children's text probably do not give special attention to the more difficult words they use in their writing, our results may overestimate the likelihood that readers will learn the meanings of unfamiliar words they encounter in their reading. Our results, however, suggest that authors of children's texts should take special steps such as those we took to ensure that more difficult words are embedded in meaning-clarifying contexts because this would certainly be beneficial to children's vocabulary acquisition.

There are several procedures that, if used, might have increased the vocabulary gains observed in the present study: including target words additional times in stories, discussing the new words, and embedding new words in interesting, meaningful stories. Elley (1989) suggests that stories having attractive characters with whom children readily identify, stories having humor, and stories with a high action plot all help children attend to the text. Neither story used in this study was humorous or had a high-action plot, and children may have had difficulty identifying with the main characters, a shepherd in *The Boy Who Cried Wolf*, a resident of the tropics in *The Crocodile's Tale*.

Greater vocabulary growth might also have occurred if more of the target words had been nouns. In the present study, many more verbs than adjectives or nouns were taught. Elley (1989) reported that children improved 24% on nouns but only 6% on adjectives and verbs from a vocabulary list with an even distribution of nouns, adjectives, and verbs.

Although the steps suggested above might have produced modest improvements in vocabulary learning in the present study, none of these steps addresses the major weakness of contexts for boosting word learning. As Pressley, Levin, and McDaniel (1987) point out, contexts may be effective for clarifying the meanings of unfamiliar words, but this clarification may do little to help subjects remember the meanings of the words. Comprehension of meanings is very different from and does not guarantee memory for meanings, particularly when several new words are encountered at the same time. Many studies have shown that word learning is much more effective when subjects are helped to form mnemonic connections between unfamiliar words and their meanings than when they are helped to simply understand the meanings of the words (Levin, Levin, Glasman & Nordwall, 1992; Pressley et al., 1987). In the present study, this may explain why subjects with higher PPVT–R scores exhibited superior vocabulary growth. It was not that they were better able to figure out the meanings of target words but rather that they possessed superior ability to retain associative connections between words and their meanings in memory.

Contrary to our expectations, several factors were not found to affect learning in the present study. Sternberg, Powell, and Kaye (1983) suggest that the helpfulness of surrounding context influences learning. Both Elley (1989) and Nagy et al. (1987) reported significant correlations between vocabulary gain scores and the helpfulness of the surrounding context. Also, the number of pictorial occurrences (Elley, 1989) and the syllable length of words (Nagy et al., 1987) have been associated with vocabulary gain from exposure to a text. However, in the present study, none of these variables was correlated significantly with the probability of learning a word. Perhaps the variability of values on our measures was insufficient. For example, most of our words were embedded in clear contexts as indicated by adults' high rate of success in defining pseudowords substituted for the target words. Perhaps our word sample was too small. Perhaps the context clarity measure was weak because it was obtained from adults rather than children. Perhaps our illustrations did not portray criterial details of target words. The fact that our words were heard whereas words in the other studies were read may have mitigated the effect of syllable length. Because the underlying causes are unclear and may have to do with inadequate stimuli or measures, no conclusions about these variables' lack of importance should be drawn from the present findings. We mention these findings to prompt further study of their importance.

One factor that appeared to influence word learning probabilities was the number of times that children heard the word. As evident in Table 4, only words that were heard four times were associated with higher rates of acquisition whereas words heard only two times exhibited low rates. However, there were several words exposed four times that did not have high learning probabilities. This reduced the correlation between frequency of exposure and learning (r = .14, $p > .05$). This indicates that hearing a word four times is no guarantee that it will be learned. Four exposures may be necessary but not sufficient for learning words from context. These findings are similar to Jenkins et al.'s (1984) results where learning did not occur with two exposures but was significant with six exposures. Also, Beck et al. (1982) found that greater exposure to vocabulary words yielded superior learning.

Findings of our research carry implications for practice. They indicate that reading stories aloud to young school children will contribute to their vocabulary growth and that children with larger vocabularies are more apt to learn new words from listening to stories than are children with meager vocabularies. Because vocabulary size is associated with school achievement (Wells, 1986) and affects language comprehension, it is implicated in reading success. Our findings support the recommendation of the Commission on Reading (Anderson, Hiebert, Scott, & Wilkinson, 1985) that teachers and parents should read aloud to young primary school children daily as a means of fostering language and literacy acquisition. Of course, to be effective, the books that are read to children must contain some words whose meanings are unfamiliar but not so many unfamiliar words as to limit their comprehension of the stories.

While reading to children benefits vocabulary acquisition, we must recognize that the contribution is not as substantial as researchers and educators commonly believe, as, for example, in Anderson et al.'s (1985) assertion, "The single most important activity for building the knowledge required for eventual success in reading is reading aloud to children" (p. 23). Effects of exposure to stories were significant but small in the present study. In a recent review of studies reporting effects of reading to children on their growth in language and literacy, Scarborough and Dobrich (in press) conclude that effects are present in these studies but unexpectedly modest.

Because children with weaker vocabularies are less likely to learn new words from listening to stories than children with larger vocabularies are, teachers may need to provide more explicit vocabulary instruction for children with smaller vocabularies. One possible method is to discuss the meanings of words used in stories that are read aloud. This suggestion is supported by Elley's (1989) finding that 7- and 8-year-old children learned more new words from listening to stories when the teacher explained words during the reading sessions than when there was no explanation. Teachers may also need to provide experiences that assist children with weaker vocabularies to become involved in the story. It may be that some children do not concentrate during story time because their vocabularies are poor. If more words are explained during story time, children with weaker vocabularies may learn more new words and may enjoy the stories more. Perhaps the most effective step that teachers can take to assist vocabulary learning is to help students create effective ways to remember the meanings of new words, either through the use of keywords or root words (Pressley et al., 1987).

References

Anderson, R. C., & Freebody, P. (1981). Vocabulary knowledge. In J. T. Guthrie (Ed.), *Comprehension and teaching: Research reviews* (pp. 77–117). Newark, DE: International Reading Association.

Anderson, R. C., Hiebert, E. H., Scott, J. A., & Wilkinson, I. A. G. (1985). *Becoming a nation of readers*. Washington, DC: National Institute of Education.

Aruego, J., & Aruego (Dewey), A. (1972). *The crocodile's tale*. New York: Scholastic.

Beck, I. L., Perfetti, C. A., & McKeown, M. G. (1982). Effects of long-term vocabulary instruction on lexical access and reading comprehension. *Journal of Educational Psychology, 74,* 506–521.

Becker, W. C. (1977). Teaching reading and language to the disadvantaged—What we have learned from field research. *Harvard Educational Review, 47,* 518–543.

Calfee, R. C., & Drum, P. A. (1986). Research on teaching reading. In M. C. Wittrock (Ed.), *Handbook of research on teaching* (3rd ed., pp. 804–849). New York: Macmillan.

Campbell, D. T., & Stanley, J. C. (1963). *Experimental and quasi-experimental designs for research*. Boston: Houghton Mifflin.
Carroll, J. B. (1971). Development of native language skills beyond the early years. In C. E. Reed (Ed.), *The learning of language* (pp. 97–156). New York: Appleton-Century-Crofts.
Carroll, J. B., Davies, P., & Richman, B. (1971). *The American heritage word frequency book*. Boston: Houghton Mifflin.
Chall, J. S. (1987). Two vocabularies for reading. In M. G. McKeown & M. E. Curtis (Eds.), *The nature of vocabulary acquisition* (pp. 7–17). Hillsdale, NJ: Erlbaum.
Clifford, G. J. (1978). Words for schools: The applications in education of the vocabulary researches of Edward L. Thorndike. In P. Suppes (Ed.), *Impact of research on education: Some case studies* (pp. 107–198). Washington, DC: National Academy of Education.
Cohen, J., & Cohen, P. (1983). *Applied multiple regression/correlation analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.
Dale, E. (1965). Vocabulary measurement: techniques and major findings. *Elementary English, 42,* 895–901, 948.
Dunn, L., & Dunn, L. (1981). *Peabody Picture Vocabulary Test—Revised*. Circle Pines, MN: American Guidance Service.
Durkin, D. (1979). What classroom observations reveal about reading comprehension instruction. *Reading Research Quarterly, 14,* 481–533.
Eller, R. G., Pappas, C. C., & Brown, E. (1988). The lexical development of kindergartners: learning from written context. *Journal of Reading Behavior, 20,* 5–24.
Elley, W. B. (1989). Vocabulary acquisition from listening to stories. *Reading Research Quarterly, 24,* 174–187.
Feitelson, D., Kita, B., & Goldstein, Z. (1986). Effects of listening to series stories on first graders' comprehension and use of language. *Research in the Teaching of English, 20,* 339–356.
Fry, E. (1968). A readability formula that saves time. *Journal of Reading, 11,* 513–516, 575–578.
Fry, E. (1977). Fry's readability graph: Clarifications, validity, and extension to level 17. *Journal of Reading, 21,* 242–252.
Graves, M. F. (1986). Vocabulary learning and instruction. In E. Z. Rothkopf (Ed.), *Review of research in education* (pp. 49–89). Washington, DC: American Educational Research Association.
Hall, W. S., Nagy, W. E., & Linn, R. (1984). *Spoken words: Effects of situation and social group on oral word usage and frequency*. Hillsdale, NJ: Erlbaum.
Jenkins, J. R., & Dixon, R. (1983). Vocabulary learning. *Contemporary Educational Psychology, 8,* 237–260.
Jenkins, J. R., Stein, M. L., & Wysocki, K. (1984). Learning vocabulary through reading. *American Educational Research Journal, 21,* 767–787.
Joss, M. (1964). Language and the school child. *Harvard Educational Review, 34,* 203–210.
Leung, C. B., & Pikulski, J. J. (1990). Incidental learning of word meanings by kindergarten and first-grade children through repeated read aloud events. In J. Zutell, S. McCormick, M. Connolly, & P. O'Keefe (Eds.), *Literacy theory and research: Analyses from multiple perspectives*. (39th yearbook of the National Reading Conference). Chicago: National Reading Conference.
Levin, J., Levin, M., Glasman, L., & Nordwall, M. (1992). Mnemonic vocabulary instruction: Additional effectiveness evidence. *Contemporary Educational Psychology, 17,* 156–174.
Littledale, F. (1975). *The boy who cried wolf*. New York: Scholastic.
Lorge, I., & Chall, J. (1963). Estimating the size of vocabularies of children and adults: An analysis of methodological issues. *Journal of Experimental Education, 32,* 147–157.
McKeown, M. G., & Curtis, M. E. (1987). *The nature of vocabulary acquisition*. Hillsdale, NJ: Erlbaum.
Nagy, W. E., & Anderson, R. C. (1984). How many words are there in printed school English? *Reading Research Quarterly, 19,* 304–330.
Nagy, W. E., Anderson, R. C., & Herman, P. A. (1987). Learning words from context during normal reading. *American Educational Research Journal, 24,* 237–270.
Nagy, W. E., Herman, P. A., & Anderson, R. C. (1985). Learning words from context. *Reading Research Quarterly, 20,* 233–253.
Nelson, K. (1973). Structure and strategy in learning to talk. *Monographs of the Society for Research in Child Development, 38*(1–2, Serial No. 149).
Pressley, M., Levin, J., & McDaniel, M. (1987). Remembering versus inferring what a word means: Mnemonic and contextual approaches. In M. McKeown & M. Curtis (Eds.), *The Nature of Vocabulary Acquisition* (pp. 107–127). Hillsdale, NJ: Erlbaum.
Rice, M. L., & Woodsmall, L. (1988). Lessons from television: Children's word learning when viewing. *Child Development, 59,* 420–429.
Rinsland, H. D. (1945). A basic vocabulary of elementary school children. New York: Macmillan.
Sachs, J. S., & Johnson, M. (1976). Language development in a hearing child of deaf parents. In W. von Raffler-Engel & Y. LeBrun (Eds.), *Baby talk and infant speech: Proceedings* (pp. 246–252). Amsterdam: Swets & Zeitlinger.
Scarborough, H., & Dobrich, W. (in press). On the efficacy of reading to preschoolers. *Developmental Review*.
Schatz, E., & Baldwin, R. (1986). Context clues are unreliable predictors of word meanings. *Reading Research Quarterly, 21,* 439–453.
Smith, M. E. (1926). An investigation of the development of the sentence and the extent of vocabulary in young children. *University of Iowa Studies in Child Welfare, 3,* No. 5.
Smith, M. K. (1941). Measurement of the size of general English vocabulary through the elementary grades and high school. *Genetic Psychology Monographs, 24,* 311–345.
Stanovich, K. E. (1986). Matthew effects in reading: Some consequences of individual differences in the acquisition of literacy. *Reading Research Quarterly, 16,* 32–71.
Sternberg, R. J. (1987). Most vocabulary is learned from context. In M. G. McKeown & M. E. Curtis (Eds.), *The nature of vocabulary acquisition* (pp. 89–105). Hillsdale, NJ: Erlbaum.
Sternberg, R. J., & Powell, J. S. (1983). Comprehending verbal comprehension. *American Psychologist, 38,* 878–893.
Sternberg, R. J., Powell, J. S., & Kaye, D. B. (1983). Vocabulary building. In A. C. Wilkison (Ed.), *Classroom computers and cognitive science* (pp. 122–143). San Diego, CA: Academic Press.
Strickland, R. G. (1971). Language in the schools. In C. E. Reed (Ed.), *The learning of language* (pp. 389–403). New York: Appleton-Century-Crofts.
Templin, M. (1957). *Certain language skills in children*. Minneapolis: University of Minnesota Press.
Thorndike, E. L., & Lorge, I. (1944). *The teacher's word book of 30,000 words*. New York: Teachers College Press, Columbia University.
Wells, G. (1986). *The meaning makers: Children learning language and using language to learn*. Portsmouth, NH: Heinemann.
Werner, H., & Kaplan, E. (1950a). Development of word meaning through verbal context: An experimental study. *Journal of Psychology, 29,* 251–257.
Werner, H., & Kaplan, E. (1950b). The acquisition of word meanings: A developmental study. *Monographs of the Society for Research in Child Development, 15*(1, Serial No. 51).

Appendix A

Stories Read to Children

The Boy Who Cried Wolf

Once upon a time there was a shepherd boy called Tom who lived alone in a little house beside his sheep barn. Day after day he sat on a hill and watched his sheep. Night after night he went to his *abode*, ate his dinner, and fell asleep.

"Nothing exciting ever happens to me," thought Tom. "I see hunters hunt in the forest and fishermen *angle* for trout in the lake. But I only sit here and *survey* my sheep." And so he did. He watched the sheep eat the grass. He watched them sleep in the sun. He watched them play follow the leader along the side of the hill.

One morning Tom was watching his sheep when he noticed several hunters walking through the forest carrying their guns. "Today I'll have some fun," he said. And he began to *clamor* as if he were in trouble, "Help! Help! Help! A wolf is going to eat my sheep."

"Don't be afraid," shouted the hunters. "We're coming." And the hunters ran out of the forest *toting* their great big guns over their shoulders.

"Where's the wolf?" they asked.

"Follow me," commanded Tom. And he *escorted* the hunters down to the lake . . . and all around it.

"We don't see any wolf," they said.

"Well, he must have gone back to my sheep," said Tom, and he *escorted* the hunters back to the sheep.

"Baaaaaaa," went the sheep.

"There is no wolf!" shouted the hunters.

"Haaaaaaa!" laughed Tom. "You're right. There is no wolf. I fooled you!"

The hunters were *irate*. "You'll never fool us again!" they said. And they *strode* back into the forest.

That night Tom was happy when he went to his *abode*, ate his dinner and fell asleep.

The very next morning Tom was watching his sheep when he saw some fishermen fishing in the lake. "I'll have more fun today!" thought Tom. And once again he began to *clamor*, "Help! Help! Help! A wolf is going to eat my sheep."

"Don't worry," shouted the fishermen. "We'll help you." And the fishermen dropped their fishing poles and ran all the way up the hill.

"Where's the wolf?" they asked.

"Ha! Ha! Ha!" Tom *chortled*. "There is no wolf. I *duped* you!"

The fishermen were *irate*. "We have better things to do than look for a wolf that isn't there." And they went back to *angle* for trout in the lake.

"Oh, that was fun!" laughed Tom. "I wish I could do it every day."

The very next morning Tom was watching his sheep when he heard a *hideous* howl which frightened him. "Who's there?" Tom called, but no one answered. Then all at once Tom saw a great big wolf standing beside him.

"I like your sheep," said the wolf. "I think I'll eat them for lunch."

"You can't do that!" cried Tom. "I'm going to get help!" And he ran all the way down to town.

"HELP! WOLF! WOLF!" shouted Tom. The people of the town came running. The hunters and the fishermen came too.

"A wolf is going to eat my sheep for lunch!" shouted Tom. "Come with me!"

"No!" said the hunters. "You fooled us before!"

"You *duped* us too!" said the fishermen.

"We heard all about you!" replied the people of the town. "You can't fool anyone here!"

"But I'm not fooling this time," Tom cried. "I'm telling the truth. Follow me and you'll see for yourselves."

"We don't believe you!" they said. "Go back to your sheep!"

"Oh my!" said Tom, "what can I do now?" And he left the town and *strode* quickly back up the hill. He looked everywhere, but he could not find a single sheep. The wolf had eaten them all.

"Nobody came to help me," cried Tom, "and now my sheep are gone." Then he saw the wolf.

"Heh! Heh! Heh!" *chortled* the wolf. "You told so many lies no one believed you when you told the truth!" Then the wolf left.

"The wolf is right," thought Tom. "I must tell the truth." And from that time on, he always did.[A1]

A Crocodile's Tale

One day when John was walking on the bank of the river, he heard someone crying. He looked around and saw a crocodile tied to a tree. "Can I help you?" John asked.

"If you *extricate* me from this rope, I will give you a gold ring," said the crocodile.

John untied the rope. "May I please have the ring now?" he asked.

"I don't have it with me," said the crocodile. "It is across the river on the other *marge*. Jump on my back. We'll go across to *procure* it." So John jumped on the crocodile's back.

The crocodile swam to the middle of the river. Then he said, "I don't have a gold ring. And now I am going to eat you up!"

"That isn't fair!" cried John. "You can't eat me. I just saved your life."

The crocodile laughed. "Most boys never get the chance to have a crocodile *consume* them."

Just then an old teddy bear came floating by. "Please, let's *query* that teddy bear to see whether he thinks you should eat me or not," John begged.

"If you like," agreed the crocodile.

"Teddy bear, teddy bear" John called. "Please settle an argument for us. I found this crocodile *snared* in a rope. He promised me a gold ring if I would *extricate* him. But when I untied the rope, he said he didn't have a gold ring. He said he would eat me. Do you think that is right?"

"I am *decrepit* now, but when I was new, I went everywhere with a little boy," said the teddy bear. "I slept with him every night. I played games with him. But when I became old, he decided to *discard* me into the river. People are not fair. So why should the crocodile be? Go ahead and eat the boy, crocodile."

"Thank you," said the crocodile. "I will."

"No! No, not yet!" cried John. He looked around and saw an old doll floating nearby. He called to the doll.

"What's the matter?" asked the doll.

"I heard the crocodile *lament* because he was *snared* by a rope," said John. "I freed him, and now he wants to eat me. Do you think that is right?"

"I am *decrepit* now," said the doll, "but when I was new, I played with a little girl. She changed my clothes all the time. She rocked

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[A1] Adapted from *The Boy Who Cried Wolf* by Freya Littledale.

(*Appendixes continue on next page*)

me and sang to me. I even ate at the table with her. But when I became old, she decided to *discard* me into the river. People are not fair. So why should the crocodile be? Go ahead and eat him, crocodile," said the doll.

"Did you hear that?" said the crocodile. And he opened his mouth to *consume* John.

"No! No, not yet!" cried John. He looked around again. He saw a monkey in a tree on the bank.

"Let's *query* that monkey in the banana tree over there to see if she thinks you should eat me."

"All right, but hurry," said the crocodile. "This is your last chance."

"Monkey, monkey!" John shouted. "This crocodile is going to eat me!"

"I can't hear you!" the monkey shouted back. "Come a little closer, crocodile. Maybe then the boy's words will be *audible*."

The crocodile swam toward the bank. John yelled, "This crocodile was caught–"

"The boy's voice still isn't *audible*," called the monkey. "Can't you come closer, crocodile?"

The crocodile complained, "I just want to eat this boy." But he swam closer to the bank. Just then, John jumped onto the *marge* of the river and was safe. "Oh, thank you," he said to the monkey. "You have saved my life. I can't thank you enough."

"Then maybe you'll help me," said the monkey. "Ask your father to plant more banana trees. Then there will be plenty for all of us. And when you see me in his trees, will you close your eyes and not *divulge* my hiding place to your father?"

"All right," said John. "You helped me, and I will help you."[A2]

[A2] Adapted with the permission of Charles Scribner's Sons, an imprint of Macmillan Publishing Company. From *A Crocodile's Tale* by José Aruego and Ariane Aruego (Dewey), 1972, New York: Charles Scribner's Sons, Macmillan Publishing Company. Copyright 1972 by José Aruego. Adapted by permission.

Appendix B

Multiple Choice Posttest to Measure Vocabulary Growth

Instructions

Now, we're going to play a detective game with "Kermit the Frog." (Take out puppet.) Do you know "Kermit?" ("*Kermit*" voice:) "Hello, ______."

In this game, I'll show you four pictures and tell you about them. Then "Kermit" will look at the pictures and give you a clue about the picture he is thinking about. You will be like a detective and try to guess which picture "Kermit" is thinking about from the clue. If you don't know, you may say, "I don't know." Let's try a few. (Two practice items precede 22 test items.)

Test Item Example

Here are four pictures about a girl. Number (1) a girl washes her hands; number (2) a girl eats a lot; number (3) a girl reads a book; number (4) a girl swings a rope. Now "Kermit" will look at the pictures and give you a clue about the picture he is thinking of.

"*Kermit*": "I see a girl consume. Which picture am I thinking of?"

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