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Explanations of words and natural contexts: An experiment with children's limericks

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Introduction

Project LISTEN's Reading Tutor listens to children read aloud, and helps them learn to read. Here, we used the Reading Tutor to study whether adding child-friendly definitions to natural text would help children learn new words. We compared four conditions:

1. No encounter
2. In a definition alone
3. In a story alone
4. In a story and a definition

This study took place at a July 2000 reading and math clinic at a low-income urban elementary school in Pittsburgh. Each student was scheduled to spend 30 minutes per weekday on the Reading Tutor.

Experiment design

We used eight children's limericks by Edward Lear (19th c.), with one target word each: *dolorous*, *laconic*, *imprudent*, *innocuous*, *mendacious*, *oracular*, *irascible*, or *vexatious*. The target word was always the second word in the last line. Our text selection controlled for genre, author, intended audience, (approximate) word frequency, part of speech, and general semantic class:

There was an Old Man of Cape Horn,
Who wished he had never been born;
So he sat on a chair,
Till he died of despair,
That dolorous Man of Cape Horn.

We wrote target word definitions in a consistent style using ordinary language, following McKeown (1993). For example: "We can say someone is *dolorous* if they are mournful, or feel really bad." To reduce variance from first- or last-item effects, we held constant the order of presentation of the limericks. Each student saw two target words per condition. Word-to-condition assignment was set for each Reading Tutor computer. One or two days later – depending on attendance – we gave each student a paper questionnaire with two items per word. "Have you ever seen the word *dolorous* before?" tested familiarity, and "If someone is *dolorous* they must be... angry; sad; tired; afraid." tested word knowledge. To exclude memorization, the definitions and the test answers used different words. In all, 29 students who had just finished 2nd - 5th grades completed the experiment, for a total of 232 trials, 58 trials for each of 4 conditions.

Results and discussion

To explore the effects of explanations and limericks, we used logistic regression – modeling a binary outcome variable using several categorical factors as input. If a factor's coefficient was significantly greater than zero, than that factor affected the outcome variable.

Word familiarity. Seeing an explanation helped, at $p < 0.001$: coefficient $1.08 \pm .32$; 99.9% confidence interval (CI) .02, 2.15. Seeing the word in a limerick showed only a weak trend, at $.50 \pm .32$; 90% CI -.02, 1.03.

Word knowledge. The results for word knowledge were more nuanced: a (not significant) trend for explanations ($.24 \pm .31$), but none for limericks ($-.05 \pm .31$).

However, younger students were about at chance:

2nd grade, 19/72 right (26%) 3rd grade, 18/72 right (25%)
4th grade, 16/56 right (29%) 5th grade, 10/32 right (31%)

For 4th and 5th graders, however, in a main-effects-only model, explanations helped ($p < .10$): $.89 \pm .52$, with 90% CI .04, 1.74. There was not an effect for limericks, at $-.13 \pm .51$. (Disaggregation by grade is exploratory.)

Conclusions. Thus in terms of learning word meaning, only explanations seemed to help – and only for fourth and fifth graders. These effects are neither same-day recency nor simple memorization. Aist (Aist 2000 ch. 6) discusses further.

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