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AUTHOR Marr, Mary Beth
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ABSTRACT

Thirty-six fourth grade pupils were grouped according to reading ability in a study conducted to examine comprehension within the framework of event perception. The children were presented a sequential activity described in picture or text form and then were asked to indicate on scoring sheets which of eight test items logically fit with the event sequences presented. Four of the test items were from the original event sequence, two were "new" but a part of the original sequence, and two were "new" but inconsistent with the event sequences. After testing, informal interviews were conducted with the students to determine their rationale for decision making. Analysis of the results indicated that good readers were more accurate in identifying old test items as logically belonging with the event sequences than were poor readers, but that no ability effect was present for responses to new items. In addition, students appeared to be less accurate in identifying inconsistent pictures than inconsistent sentences. A follow-up investigation with good readers indicated that pictures seemed more subject to ambiguous interpretation than text, but more so when they appeared as recognition test stimuli than as presentation stimuli. (TJ)

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Mary Beth Marr
Assistant Professor
Department of Reading
Educ. B 8
SUNY, Albany
Albany, New York 12222

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CHILDREN'S APPREHENSION OF PICTORIAL AND TEXTUAL EVENTS

Mary Beth Marr
Department of Reading
SUNY, Albany

Typically reading research has assessed a student's comprehension of a passage through: 1) story recall (Goodman & Burke, 1973) 2) responses to literal and inferential questions and more recently 3) analysis of text structure and its influence upon student's ability to answer comprehension questions or recall the story (Thorndyke, 1977; Frederiksen, 1975a). The present investigation examined comprehension within the framework of event perception. Children were presented a sequential activity (i.e. an event) in picture or text form and asked to make judgements about corresponding test items.

Previous event perception research has presented event sequences and manipulated corresponding test items in a recognition task (Jenkins, Wald & Pittenger, in press; Brown, 1976). Students were to identify test items as "old" (previously shown) or "new". False identification of new test items congruent with the event was evidence that an event theme was abstracted and individual sequence items were integrated into one coherent idea. This investigation examined more closely the extent to which theme straction occurred through a decision task rather than a recognition task. In addition,

mode of presenting the event sequences and student reading ability were independent variables manipulated to determine the nature of this abstraction. Response difference which might occur as a result of these factors may suggest differential processing of stimuli or differential processing strategies.

Method

Subjects

Thirty-six 4th grade students from a suburb of St. Paul Minnesota participated in the study. They were grouped according to reading ability. Good or poor readers were identified by vocabulary and comprehension test scores on the Iowa Test of Basic Skills.

Stimuli

The events from which the pictures and sentences were developed consisted of three sequential activities familiar to children. The paradigm for generating the event was based upon materials developed by Jenkins et. al. (in press) and Brown (1976). Familiar event sequences were chosen to maximize memory for what was seen or read and to enhance students' ability to abstract an event and establish relationships between and among event items. The three event sequences selected were: drawing a picture, putting on outdoor winter clothing, and checking out a library book. Eight slides per sequence were taken. After an event was photographed, two additional slides were taken. These slides maintained the same character and environment, but violated event content by manipulating stimuli within this environment in a manner inconsistent with the sequence. An example of an inconsistent item was the framing of a blank sheet of paper.

One sentence narratives were written to correspond to each slide comprising the events. Independent judges cross validated the narratives for semantic equivalence with the pictures by selecting slides which best described the sentences. Following this validation process, the sentences in each sequence were slightly modified so that across sequences each sentence occupying a given place in the sequence contained the

same number of words and propositions (Kintsch, 1974) as its counterpart in the other sequences. In this manner, the number of idea units expressed across sequences was systematically controlled.

Each event sequence contained five pictures or sentences. In the test condition each test set consisted of eight items. Four items were from the original event sequence (i.e. old). The other four test items served as controls. Two were "new" but a part of the original sequence photographed thus identified as consistent with the event and labeled "high fit" items. Two other test items were "new" however, inconsistent with the event sequence and labeled "low fit" items.

Design and Procedure

The experimental design was a 2x2x3 factorial. Two between subjects variables were ability (good and poor readers) and mode of presentation (pictures or text). A third variable, sequence, was a within subjects factor. The analysis of new item responses introduced a fourth variable, item fit (high fit, low fit) as a within subjects factor. Students were blocked on reading ability and stratified randomly into one of two modality conditions. They were presented all three events in a fixed order then given corresponding test items. Presentation and testing were conducted in the same mode. Students indicated on scoring sheets which test items logically fit with the event sequences presented.

After testing, informal interview were conducted with the students to determine their rationale for decision-making.

Results

An analysis of variance on responses to old test items revealed a significant ability effect, F (2,30) = 11.82, $p < .001$. Good readers were more accurate at identifying old test items as logically belonging with the event sequences than poor readers. However, no ability effect was present for responses to new items.

A significant main effect for mode of presentation did occur for new item ponses, F (2,30) = 32.444, $p < .001$. Students were less accurate at identifying

inconsistent slide pictures than inconsistent sentences.

New item responses also differed significantly across event sequences, F (2,60)= 43.424, $p < .001$. More belonging responses occurred in Sequence 1 than in Sequences 2 and 3. Neuman Keuls contrasts revealed that no significant difference occurred between responses in Sequences 2 and 3. A follow-up test in which order of presenting events was reversed (3-2-1) revealed that differential responses to Sequence 1 were due to order effects. Serial position of the event resulted in tighter "fit" criterion. More errors of judgment occurred with the first than the last event.

A significant main effect was obtained on item fit, F (1,30) = 52.32, $p < .001$. Both good and poor readers were able to distinguish new items as consistent or inconsistent with the event sequences. The mean score for high fit items was $\bar{X}$=1.194 while the mean score for low fit items was $\bar{X}$=.556.

An ability by mode interaction also occurred, F (2,30) = 15.165, $p < .001$. In the picture condition both good and poor readers had difficulty identifying new inconsistent items as not belonging. Mean scores responses for good and poor readers were $\bar{X}_g$ = 1.722 and $\bar{X}_p$ = 1.056 respectively. Poor readers also had difficulty identifying inconsistent sentences, $\bar{X}_p$ = 1.111. Good readers however, were highly accurate at making belonging decision in the text condition, $\bar{X}_g$ = .472.

Discussion

These results indicate that both good and poor readers were able to identify new test items as consistent or inconsistent with the event sequences. These findings are evidence that event themes were apprehended; individual sequence items were integrated into a coherent theme. Clearly, differences were present in the children's ability to make judgments across presentation modes. Pictures elicited a much looser criterion for belonging judgments than sentences as evidenced by errors made by both good and poor readers when identifying inconsistent picture items. Perhaps these differences are due to the implicit-explicit nature of the stimuli. For example, inconsistent sentences stated negation such as unframed, dropped and

forgot. By contrast, these changes had to be apprehended in the pictures and interpreted within the framework of the preceeding event sequence.

It should be noted that even with the more precise text, poor readers continued to make judgment errors in this condition. Perhaps this effect is the result of attentional limits which could have resulted in decreased comprehension of the text (LaBerge & Samuels, 1974). In general, task practice increased precision of judgment across presentation modes for both good and poor readers.

Cross Modal Comparisons

Additional follow-up investigations were designed to make new comparisons; to examine children's judgments about event sequences when presentation and testing modes differed. It was felt that these new comparisons would allow examination of children's decision-making abilities from one mode to another, allow comparisons with the earlier decision task, and might suggest implications for instruction.

Utilizing the same materials, the comparisons studies included:1) a pictorial presentation mode and textual test set (PT) and 2) a textual presentation mode and pictorial test set (TP). For comparison purposes, only good readers participated in the study to minimize possible confounding that might result from poor decoding skills.

Results and Discussion

The following presentation and testing comparisons were made on both old and new item responses: PP, TT, PT, TP. An analysis of responses to old items revealed no significant differences between all four investigations. However, analysis of new item responses indicated a significant main effect for item type across all comparisons and a significant difference among responses in the PP,TT,PT comparisons studies and the TT,TP studies. To further illustrate these differences, Table 1 lists all of the mean responses for both high fit and low fit items in each comparison study.

Insert Table 1 here

As one goes from a totally pictorial to a totally textual situation, the number of belonging judgments decrease for both high fit and low fit items. Also textual testing increases the precision of correct judgments for low fit items more than textual

presentation. In short, there appears to be some additive increase in belonging judgments associated with the presence of pictorial stimuli and this effect is even more pronounced for low fit items. Pictures seem more subject to ambiguous interpretation than text, but moreso when they appear as recognition test stimuli than as presentation stimuli.

Implications

Contrary to past research utilizing pictures, these findings imply that pictures do not always facilitate learning nor are merely adjuncts to text (Samuels, 1967). However, the role of pictures remains somewhat abmiguous; even good readers had difficulty extracting appropriate information and making judgments about pictorial stimuli. In addition, Psychological research indicates that the nature of information extracted from a picture is unclear (Mandler & Robinson, 1978). Consequently, it appears imperative that when pictures are used as a part of instruction, key concepts need to be identified and their relationship to the contents of the picture discussed. One should not assume that children, particularly poor readers, are capable of apprehending and integrating pictorial information independently. Further research establishing the semantic and salient dimensions of pictures needs to be conducted to better determine their advantageous use during instruction.

Table 1

Cell Means for Responses on New Items
(maximum score for new items = 6.0)

Experiment	High Fit	Low Fit
PP	5.667	4.667
TP	4.667	2.500
PT	4.667	.167
TT	2.333	.500

*

1.0 rating = belonging decision for each item
0.0 rating = not belonging decision for each item

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