

The Effects of Positive and Negative Illustrations On Text Recall*

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We examined the effects of positive and negative illustrations on text recall. 27 university students were divided randomly and equally into three experimental groups. All subjects received the same text and the same set of instructions. The positive illustration group received the text accompanied by corresponding illustrations. The negative illustrations group received the text with contradictory illustrations. The control group received an unillustrated version of the text. The presence of positive illustrations enhanced the recall of textual propositions, and the negative illustrations inhibited recall. These results suggest that publishers and authors should take care when selecting illustrations to accompany texts so that learning is optimally facilitated.

1. Introduction

There have been many studies conducted on the effects of text illustrations on comprehension and recall of the material. However, there is not much data on the specific effects of positive or negative illustrations on recall. Positive illustrations refer to visual stimuli that correspond to the material in the text, whereas negative illustrations contradict the text. Through this research we hope to provide some data regarding the effects of text illustrations that will improve the way text books and other manuals are presented.

2. Research Questions

1. Do text illustrations have an effect on recall?
2. What are the roles of positive and negative illustrations on the recall of a text?

3. Methodology

3.1 Participants

Undergraduate university students were asked to complete a form that included contact and demographic information, such as place of birth and native

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language. An appointment was scheduled with randomly selected subjects who volunteered for testing.

3.2 Materials

An article was selected from a magazine to serve as reading material for this study. The article was then retyped on a word processor and manipulated to suit the three experimental groups. (1) The "positive" group received a copy of the text with corresponding pictures added; (2) the "negative" group received the same text with contradictory pictures; and (3) the control group received an unillustrated copy of the same text.

3.3 Procedure

All the testing was carried out in the same research room. Upon arrival, students were given a sheet of instructions, randomly assigned to a group and given the appropriate version of the text. They were instructed to read the text over as many times as they felt necessary. Ss were asked to try to remember as many main and supporting ideas as possible for the summary they would have to write. When the Ss felt that they had sufficiently read the text, it was taken and they were given a work puzzle that they had five minutes to complete. Next, the Ss were given a sheet of lined paper on which to write their summary. Ss were allowed as much time as they wished to complete the summary. They were debriefed and signed a consent form prior to leaving the lab.

4. Results

All results were tabulated in groups, no individual results were considered.

Table 1. Number and Percentage of Each Level of Proposition Recalled by Each.

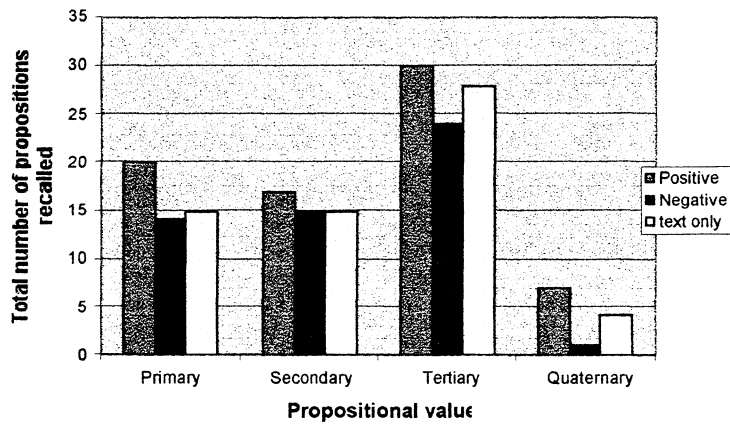
Experimental Group			
	Positive	Negative	Text only
Primary	20 (25%)	14 (17%)	15 (19%)
Secondary	17 (16%)	15 (14%)	15 (14%)
Tertiary	30 (19%)	24 (15%)	28 (17%)
Quaternary	7 (11%)	1 (2%)	4 (6%)

N=9 for each group

##= total number of propositions recalled, (##)= percentage of propositions recalled

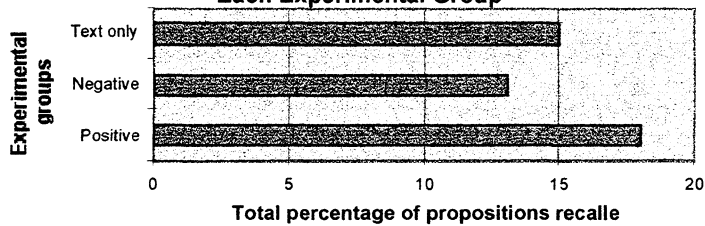
Results are concordant with our hypothesis, indicating that illustrations do have an effect on recall. As expected, we found that positive illustrations seem to aid recall, whereas negative illustration seem to hinder recall, compared to our text only control group.

Table 2. Total number of Each Level of Proposition Recalled by Each Experimental Group



As shown in Table 2, the positive group recalled more of each level of proposition. The negative group recalled an equal or lesser amount of each level of proposition than both other groups.

Table 3. Percentage of Propositions Recalled by Each Experimental Group



While the positive group recalled the highest overall percentage of propositions, it is important to note that they still only recalled 18 percent of the total possible number of propositions.

Table 4. Number of Subjects Remembering Each Proposition

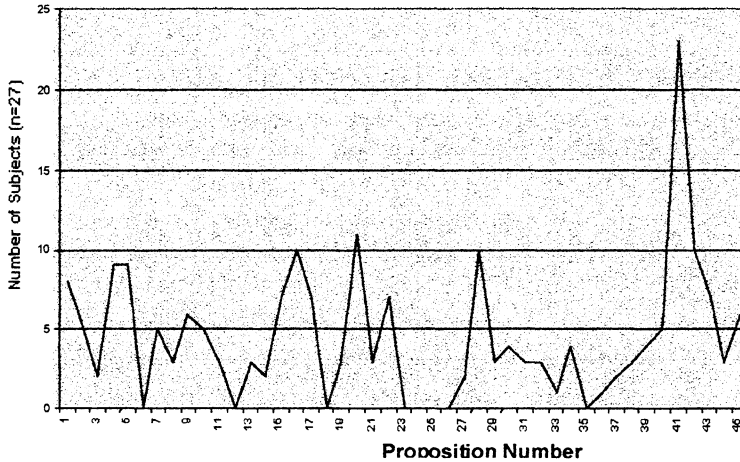


Table 4 clearly depicts the number of participants recalling each proposition. Note the absence of recall of propositions 23 – 26, and the high number of participants recalling proposition number 42.

Several references to the negative illustrations made by participants were of particular interest:

- “Starcraft”
- “10th star”
- “Thought it was just a star”

These references demonstrate that individuals did look at the illustrations and recall was affected accordingly.

N.B. All above results are based on raw data. No statistical analysis has been conducted.

5. Discussion and Conclusions

This study was designed to test the effects of illustrations on text recall. The major finding of this study was that positive illustrations do seem to enhance recall, and negative illustrations seem to inhibit recall.

The results of this study support Paivio’s (1986) and Craik and Lockhart’s (1972) theories that dual coding results in better recall, specifically the illustrations seem to result in greater depth of processing than text alone. In this study the three experimental groups performed as predicted.

The positive text illustrations group outperformed both the control group and the group receiving negative illustrations. The students in this group remembered a higher total number of propositions. Another indicator of the superiority of the positive condition group is that they remembered the highest number of primary level elements, indicating a qualitatively better understanding of the general intention of the text.

The data collected from the negative text illustration group reveals that pictures can sometimes act as distractors for the reader. This group recalled the least overall propositions, and the lowest number of primary level propositions. The illustrations that were added to the text for this condition were intended to be distractors. Since the illustrations did not correspond with the text, there was no overlap of information and so, according to the dual coding theory (Paivio, 1986), interconnections were inhibited between the two subsystems. Thus, recall was not facilitated.

We can be somewhat assured that our results are related to the experimental conditions as comments were made in some summaries that pertained specifically to negative information that was contained in the negative illustration only and not in the text. In the article the unknown entity was referred to either as a battlestar or a planet, in the negative illustration it was labeled as a star. Three subjects in the negative condition made specific reference to a "star" in their summaries. In contrast, participants of the positive and control conditions made reference strictly to a battlestar or a planet.

One noteworthy trend in the data is that almost all subjects (23 out of 27) recalled proposition number 42 (that the artificial planet in question was made up almost entirely of metal) that all three raters independently assessed as being tertiary level. Because of the position of this element (near the end) in the text, this phenomenon could be attributed to the primacy and recency effect. This theory states that the first and last propositions of a text are more easily recalled. The lack of recall of the middle propositions (number 23 – 26) also supports this theory.

The recall of proposition 42 could also be a result of seductive detail since this item is particularly bizarre and hence more memorable.

The methodology of this study imposes several limitations on the results. The generalizability of these findings is limited by the selection of subjects and the type of text employed.

The participants of our study were university students, and so their reading habits may not be the same as those of the general public. Whether supplementing text with illustrations enhances knowledge depends on the context in which learning occurs and characteristics of the learner. Biggs (1987, 1988) has argued that not only are there trait-like differences between students in approaches to learning, but tasks, demands and learning contexts regulate a student's motives and strategies. In terms of enduring characteristics, Biggs has claimed that some students are habitually instrumental, surface oriented and reproductive, while others are enquiring and generative through being motivated primarily by curiosity. As well as noting differences in performance related to learning styles, Biggs (1988) has contended that different sectors within the education system are characterized by different approaches to learning. Learners may fail to make effective use of illustrations. The instructions for the participants of the present study were not overtly directed to attend to the illustrations present in their text. So, while illustrations may physically accompany a passage, much is left to the reader's discretion as to whether or not the illustration is attended to, and in what manner, and for what purposes (Levie & Lentz, 1982).

A limitation of the present study is that only one type of text was used. The results might not be generalizable to other text formats such as highly technical texts, where a high level of prior knowledge may play a more important role (Kliese & Over, 1993).

So, as for the debate about when a picture is worth ten thousand words, it seemingly depends not only on the informational content of the illustrations alone, but the cognitive capacity of the learner to interrelate text and illustrations. The results of this study suggest that authors should take particular care when choosing illustrations to accompany their text to facilitate material recall.

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