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ABSTRACT
                In a study of children's reading processes in
English, 261 pupils from a Hong Kong Anglo-Chinese school and from an
urban comprehensive school in England were given different versions
of a text in English and asked to read it silently in preparation for
a memory test sometime in the future. Three weeks later, they were
tested on story recall. Three text types were distributed: a
congruously-illustrated text (CIT), an incongruously illustrated text
(ICT), and the text alone (TA). In each of these text types, cultural
schemata of the stories were either British- or Hong Kong-related. As
anticipated, the British group performed significantly better than
their Hong Kong counterparts, with no significant effects or
interactions for either recall of detail or comprehension of general
idea. Among the Hong Kong students, many failed to recall either main
idea or detail. Pupils reading the CIT performed almost twice as well
as the other groups. Pupils reading stories set in their own cultural
backgrounds had better recall in every instance. Post-test interviews
of subjects also gave insight into the relatively different
performance of the two groups; pupil expectations played an important
role. Contains 25 references. (MSE)

THE IMPACT OF ILLUSTRATIONS AND CULTURAL SCHEMATA ON HONG KONG PUPILS' READING COMPREHENSION AND RECALL OF TEXT

TERRY DOLAN

2

THE IMPACT OF ILLUSTRATIONS AND CULTURAL SCHEMATA ON HONG KONG PUPILS' READING COMPREHENSION AND RECALL OF TEXT

Terry Dolan

Introduction

A fundamental assumption underlying the teaching of reading in schools is that pupils will be able to use their reading ability as a vehicle for learning (Lunzer and Gardner 1979). A second is that, where appropriate, they will draw upon previous reading to solve problems associated with current studies. Hence, textbooks are not only regarded as repositories of essential information and subject matter, but as sources of exercises required for mastering subject disciplines. It is assumed that some of the knowledge in school texts is so important that it needs to be learnt verbatim, whilst pupils need only extract the essential messages or themes from other pages. Over sixty years ago, Bartlett (1932) showed that readers seldom commit to memory each word they read in a passage verbatim. Instead, on the basis of what they have understood already, they mentally précis units of text and keep these summaries in mind as they seek the overall structure or gist. Comprehension is hence governed by what readers already know about the topic, what they have extracted from the passage so far and how effectively they link elements of meaning appearing as the passage unfolds.

Bartlett also showed how comprehension is influenced by cultural background, with readers from one ethnic group failing to grasp the significance of passage detail based on unfamiliar cultures, but effortlessly assimilating familiar schemata from their own cultural experiences. Tested subsequently to see how much they could remember, all subjects recalled the gist of passages more readily than the details and all groups best recalled information relating to their own cultural background.

The significance of such findings will not escape the teacher of English as a second language: pupils reading texts with content based on the culture of speakers of the target language may recall and understand information less well than if it was framed against culturally familiar schemata. At present, it is usual for reading practice to be given using texts based mainly on schemata belonging to indigenous speakers of the target language, for this both broadens horizons and facilitates insight into their world. However, in view of Bartlett's findings, it is worth considering giving pupils reading practice using second language texts featuring more familiar subject matter.

As they read, good readers will temporarily disregard text signals whose importance is not immediately apparent and read on in search of the overall meaning (Meyer 1984). In contrast, poorer readers, especially of a passage with unfamiliar content, are inclined to latch on to any known item of vocabulary in the hope that it will give some idea about passage content and structure (Ohlhausen and

Roller 1988, Kintsch 1987). Will readers of a difficult text in a foreign language do the same, clutching at any clue in the hope that it will unlock the message the author has written? If this is indeed the case, then pupils' comprehension may be swayed by schemata which bear on their own rather than on a foreign culture, whether or not such items are pertinent to the essential theme of the passage.

Illustrations accompanying text are usually intended to clarify, complement or add to the written information. However, unlike the situation with text where the amount of information conveyed can be controlled fairly precisely by the author, the amount of information in an illustration can be vast and its interpretation hard to regulate (Levie 1987). Thus, while readers may draw inferences from illustrations which support or supplement the meaning in a text, equally importantly they may also form mental representations at odds with or even contradicting the author's intended meaning. Levin et al. (1987) suggest that all readers will in some degree resort to consulting accompanying pictorial information when faced with conceptually demanding or incoherently written text. Hence one might expect poor readers or those who lack confidence in their understanding of the language deliberately to seek guidance from the illustrations in a text.

Kintsch (1974) and van Dijk and Kintsch (1983) propose that the information presented in a text may be analyzed in terms of 'propositions', 'atoms of meaning' which together constitute the overall meaning or 'macrostructure'. Reading comprehension, it is suggested, involves representing to oneself the meanings one thinks reside in text. Good readers are skilled at spotting good prospects to hold in mind and carry forward to forthcoming sentences. If comprehension breaks down they usually resort to one of two options: either they press ahead hoping that things will be clarified by subsequent information, or they back-track seeking to identify the point where understanding faltered (Kintsch 1987). Sanford and Garrod (1981), contesting Kintsch's assertion that the macrostructure of text is assembled from how it is propositionally analyzed by the reader, propose that texts are interpreted through a complex series of representations resulting in 'messages' rather than propositional lattices.

Regardless of this dispute, none of the above theorists would challenge the view held by many teachers that pupils listening to or reading a foreign language have a constant fear that the information being carried forward during comprehension is unsound. Language teachers know that even slight suggestions that information is not properly understood may cause pupils' confidence to waiver.

Research into the contribution of illustrations to reading comprehension has highlighted how they sometimes compete with words as sources of information. Samuels (1970) showed how illustrations often seduce the poor reader into relying on the illustration rather than the words to access meaning in sentences. Schallert (1980), researching the function of illustrations in extended text, concluded that they undoubtedly have a positive effect on the comprehension both of narrative and expository prose. After an exhaustive review, Levie and Lentz (1982) concluded that most research has shown that reading comprehension is facilitated by illustrations amplifying or supplementing information in the text, but that cosmetic

4

or incidental illustrations have little impact. In an intriguing study, Read and Barnsley (1977) presented adult Canadians with versions of a reader they had last seen in elementary school. One version contained the text alone; one showed the illustrations and nothing else; and one contained both. Virtually nothing was cued either by the text alone or pictures alone, but when the two were presented together a surprising amount of the story was instantly recalled.

In a key study involving pupils reading in a foreign language, Jahoda et al. (1976) examined the effects of illustrations in culture-free expository text with samples of first and second language pupils of secondary school age. They showed convincingly that the advantage with all ethnic groups was significantly in favour of pupils who had read text with illustrations. The pupils sampled by Jahoda et al. were fairly proficient in English, and one wonders what would have happened if for some groups the illustrations had been more of a life-line for comprehension than the text itself, as is often the case with readers with poor English.

Denburg (1977) proposes that there is a trade-off between written and pictorial information, and that efficient readers of a straight-forward text will note but not scrutinise illustrations. If they meet an illustration which seems incongruous to the text they will register this but press ahead. On the other hand, poor readers detecting an inconsistency between text and illustration instinctively assume that it is their own poor grasp of English which is the source of the confusion. Such uncertainty and self-doubt is familiar to foreign language teachers and many will repeatedly give pupils exercises involving rote learning to ensure that vital elements of the target language can be called upon at will to facilitate communication and further learning.

With the above points in mind the following experiment was carried out, subjects being drawn from the United Kingdom and from a Hong Kong school in which the curriculum is delivered principally in English. Pupils were given different versions of a text in English and asked to read it silently in preparation for a memory test to be given some time in the future. It was anticipated that the children's ability to assimilate and subsequently recall what they had read would reflect their facility with English, their response to the text and whether they had consciously sought guidance from the illustrations.

Method

Textual Material

An adventure story was written in booklet form around four black and white illustrations, each giving support but not adding materially to the story line. In a second booklet, illustrations showing the main characters in the story in settings incongruous to the story replaced the original pictures. A third booklet contained the text alone. Two versions of each booklet were then prepared: one with western characters, background and scenes, the other with a Hong Kong background and characters with Chinese names. Thus a total of six booklets were prepared. The text

was validated with Form Three secondary pupils in Hong Kong, who read it drawing attention to any wording hard to understand. Amendments were made until the text was judged easy to follow.

Subjects

The Hong Kong sample was drawn from Form Three classes in an Anglo-Chinese grammar school admitting children predominantly from Bands One and Two. The United Kingdom sample was drawn from Year Three classes in an urban comprehensive school in Nottingham whose population includes the full social and intellectual range. Children were randomly allocated to groups and no child needed to be excluded on the grounds of poor reading ability. Table 1 summarises the distribution of subjects to the various experimental groups.

Table 1

Distribution of Subjects to Groups

		CIT	ICT	TA	Total
HK group	UK version	24	23	25	72
HK group	HK version	42	42	37	121
UK group	UK version	13	13	12	38
UK group	HK version	10	9	11	30
Total		89	97	85	261

*Note: CIT = Congruously Illustrated Text
ICT = Incongruously Illustrated Text
TA = Text Alone

Procedure

The writer was assisted by two experienced teachers, one from Nottingham and one from Hong Kong. Both were accomplished researchers, were well known to the pupils and each held a recent higher degree. Pupils completed the initial reading in normal classroom conditions, having been told in their mother tongue that they had been chosen to take part in an important experiment to discover how much people remember of what they read. They were handed a colour-coded test booklet, informed they would be tested in three weeks' time and given as long as they wished to read and digest the story. Taking the task seriously, pupils from England took about twenty minutes to complete the task and pupils from Hong Kong about ten minutes longer.

Three weeks later, the pupils were tested as whole classes during regular English lessons. Given paper, they were asked to write down all they could recollect of the story but not to add their names. The British pupils took about twenty-five minutes and the Hong Kong pupils between two and thirty-five minutes to write down the story. After the papers had been handed in, the full purpose of the experiment was disclosed to the pupils who were then asked about the effects of the schematic background of the story and the illustrations. Even though some children could recall little, most were willing to talk about the task and seemed genuinely interested.

Scoring

Scripts were marked for recall of detail and recall of gist. Scoring for detail was based on procedures by Meyer (1975) and Lunzer and Byron (1981), and consisted of segmenting the text into text units, each of which attracted one mark. Scoring for gist took account of procedures developed by Riding and McQuaid (1977) and consisted of seeing how closely each script included reference to key developments in the story, whether or not identical wording had been used. Placing events and developments in their correct story sequence also earned marks. The scoring procedure earned the approval of a panel of experienced public examination markers and psychologists. Each script was marked blind and independently by members of a team of judges and any discrepancies sorted out. Scripts from subjects who had received ICT booklets were examined for information which had appeared in the illustrations but not in the text.

Results

The main interest in the present paper is in the results gained by the Hong Kong subjects, but the performance of the United Kingdom pupils is summarised below for reference.

As expected, the British pupils were significantly better than their Hong Kong counterparts at recalling information. With the British group alone, multivariate analysis of variance revealed no significant main effects or interactions, either for recall of detail or of gist. Post-test discussions suggested that performance had been principally influenced by the reading of the text rather than by the illustrations. Nevertheless, there was a slight but non-significant tendency to do best with texts with 'British' schemata, and with CIT material. Many children who had had the ICT stories said they had noticed that the pictures did not match the story but had ignored this. Pupils reading the 'Hong Kong' schematic material had been generally attracted by the unusual names and location of the story, and many were able to recall the Chinese names perfectly. An interesting point is that the British children had not had such a test before and welcomed the opportunity to test their memory for textual material.

Turning to the performance of the Hong Kong group, the first point to note is that many children failed to recall either the detail or gist of the story. Thus, attempts to apply multivariate analysis of variance floundered due to a lack of homogeneity in the data. In order to effect a cogent analysis, subset analyses were carried out using one-way analysis of variance and a formula accepting cells of unequal size (Youngman 1976).

The influence of the cultural (schematic) background of the passage on pupils' recall of detail and gist is summarised in Table 2. It is very clear that the children were much better at recalling both the gist and the details of the story based on their own cultural background than the story involving United Kingdom schemata and background information.

Table 2

Effects of Cultural Schemata on Recall

	Detail		Gist	
	mean	s.d.	mean	s.d.
UK booklets	3.12	3.00	2.74	2.19
HK booklets	7.78	8.86	4.31	2.51
between-group testing	t=4.29 (p<.01)		t=4.40 (p<.01)	

Table 3 summarises the effects of type of text on performance. As may be seen, pupils reading the CIT booklets did almost twice as well as their classmates in the other two groups in terms both of recalling detail and penetrating the gist of the story. In fact, the TA group recalled slightly more detail than the ICT group, but less well in terms of remembering the gist.

Table 3

Effects of Text Type on Recall

	detail		gist	
	mean	s.d.	mean	s.d.
CIT (n = 66)	8.80	9.69	4.56	2.51
ICT (n = 65)	4.55	6.67	3.49	2.37
TA (n = 23)	4.66	4.53	3.08	2.43
One-way ANOVA	F-ratio 7.0119 (p<.01)		F-ratio 6.2399 (p<.01)	

Table 4 summarises performance when the effect on recall of type of text is analyzed alongside the schematic background of the story. The results could not be more clear: pupils reading booklets based on their home background did better in every instance than their peers reading booklets based on the United Kingdom. Generally speaking, pupils did best on recalling CIT material; they recalled the TA booklets better than the ICT material for the United Kingdom based stories, in terms both of content and detail; and did slightly better on texts with Hong Kong based illustrations even when they did not fit the story.

Table 4

Effects of Text Type and Schematic Background

	Detail		Gist		
	mean	s.d.	mean	s.d.	N
CIT - UK schemata	3.50	3.10	3.54	2.12	24
CIT - HK schemata	11.83	10.81	5.14	2.53	42
ICT - UK schemata	2.70	2.73	2.22	2.08	23
ICT - HK schemata	5.75	7.97	4.19	2.22	42
TA - UK schemata	3.16	3.11	2.44	2.14	25
TA - HK schemata	5.68	5.03	3.51	2.52	37
One-way ANOVA	F-ratio 8.4062 (p<.01)		F-ratio 6.8635 (p<.01)		

In order to examine more precisely the relationship between gist and detail recall and to rule out uncontrolled between-group differences, it was decided to carry out a regression analysis in which the gist scores of the entire Hong Kong sample, irrespective of sub-group, were used to predict the detail score for each subject. The differences between predicted and obtained scores were transformed into residual scores then standardised around a mean of zero. The results are shown in Table 5, where a negative score signifies worse than anticipated performance and a positive sign signifies better.

On texts with United Kingdom schema, the children did worse than their overall pattern of gist scores would suggest. In particular, the children who had read the CIT story remembered detail less well than their memory for gist would suggest. In contrast, with the Hong Kong based material, children who had read the CIT story recalled text detail very well, especially in comparison with pupils in the other groups. It is interesting to note that subjects who had read ICT material displayed relatively poor recall of detail.

Table 5

Residual Analysis: Schemata by Text Type

	Residual scores	
	mean	s.d.
CIT - UK	-2.14	3.93
ICT - UK	-0.08	2.78
TA - UK	-0.10	3.51
CIT - HK	2.72	7.62
ICT - HK	-1.48	4.74
TA - HK	0.09	4.21
One-way	F-ratio 3.9386	
ANOVA	$p < .01$	

Discussion

Post-test interviews with the children cast some light on why the two national groups performed so differently. Whereas the British children found the testing of their memory an unusual and interesting exercise, the Hong Kong pupils regarded such testing as routine in their run up to examinations. In fact, they claimed they had had several such tests in the interval between the initial and follow-up experimental sessions. They welcomed the presence of illustrations in the story, whereas the British children considered them unimportant. Aware that their task was to memorize the text, most British children said they had neither studied the pictures nor been put off by pictures which did not appear to fit the story line. Having decided the pictures were unlikely to be significant, they simply dismissed them. In contrast, many of the Hong Kong children admitted to being puzzled by the incongruous pictures, to presuming that the pictures must be relevant and that somehow their English comprehension was at fault.

Although the British children took little heed of the illustrations, most admitted glancing at them. Studies by Goodykoontz (1936), Peeck (1974, 1985) and Dolan E. (1988) also found that secondary pupils do not seem to take any discernable notice of illustrations when reading stories in their mother tongue. Hence, it is interesting to note that the Hong Kong group said they had deliberately consulted the illustrations, considering them vital adjuncts to the text. This comprehension strategy is of course taught systematically in reading kits such as the SRA but is a technique rarely used consciously by skilled and confident readers of undemanding text (Fawcett 1979). Jahoda et al. (1976) report that the only illustrations having any impact on the second language readers in their study were those portraying material not present in the text but, as mentioned earlier, all the children in their experiment were quite proficient in English.

Returning to the present study, both national groups said that during the recall session they were aware of the pictures providing cues and clues about content. Although the presence of 'English' and 'Chinese' pictures and schemata was dismissed as being beside the point by the British children, many pupils said that the Chinese names were so unusual that they had deliberately memorized them. Contrast this with the many Hong Kong pupils who frankly confessed that they usually 'skip' foreign names in stories. In fact, some said their interest waned instantly on seeing the English names and pictures. One has to remember that the text had been developed chiefly with Hong Kong pupils, so the British groups had found it quite simple and might have had recourse to the pictures had the language been more demanding. Hence, the TA British group said they would not have benefited from pictures in the text, whereas the Hong Kong group said they had found it a chore to face unbroken text and would have welcomed pictures.

The incongruous pictures had little significant impact on the British children. However, a number of Hong Kong children actually wove their story around the illustrations, for example writing about "robbers and thieves" rather than "kidnappers". One child wrote, "the police atch the man who had not hair", reference to a picture showing a bald man, a point not actually mentioned in the story. The only evidence of a British child being misled came from a boy who wrote, "the police used a spotter plane", reference to an incongruous illustration showing the plane in the air, whereas the kidnappers in the actual story were apprehended before they had time to take off.

A serious point to ponder is that, whereas the British children welcomed the challenge of sorting out for themselves the meaning residing in the text, the Hong Kong children gave the impression that they would sooner have relied upon the guidance of their English teacher, guidance which they indicated is usually forthcoming. The insinuation is that some Hong Kong teachers seem to doubt the capacity of their pupils to fathom unaided the main points and gist contained in extended English prose. They thus resort to 'duck-feeding', ensuring uniformity of knowledge coverage but doing little to build up pupils' confidence in their ability to work independently.

If it is indeed the case that second language learners who lack confidence in their language proficiency will seek refuge in illustrations when they experience problems in understanding text, one ought to be aware that, although illustrations may facilitate matters, it is unwise to presume that understanding has been arrived at through verbal processing whenever visual aids to comprehension are also present. However, one would not argue that illustrations serve no useful purpose. Far from it! They captivate interest, add appeal to reading material and offer fascinating insights into salient aspects and unfamiliar schemata. But this is not to suggest that it is always essential, or even desirable, at the practice stage for readers to encounter a diet of texts based on the target culture alone. Rather, beginning readers of a second language will benefit from exposure both to texts containing target language schemata and texts featuring schemata and content familiar to their own cultural background.

11

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13