

Schemata and Memory for Sentences: The Effects of Exposure to a British Environment on the English of Hong Kong Teachers at University in England

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Sixteen fairly long sentences, eight with United Kingdom and eight with Hong Kong background themes, were presented one at a time on audio-cassette to 144 Hong Kong teachers of English, who listened to each one and immediately wrote down what they thought they had heard. Sixty-four had never been to England, forty had been at university there for three months and forty for nine months. The sentences were also presented to twenty native English-speaking undergraduate students in the United Kingdom. Schematic background of the sentences significantly influenced recall, with both national groups doing best on schematically familiar sentences. The recall of the United Kingdom sentences by the Hong Kong teachers improved in relation to exposure to an English environment and the time they had had to acquire 'British' schemata. The study highlights the benefits of prolonged periods of exposure to authentic English and associated improvements in language proficiency.

General Background to the Investigation

Environmental Influences on Second Language Learning

In countries like Hong Kong where English appears on the school curriculum as a second language, it is hoped that pupils will use the English learnt in class in their out-of-school environment. In theory, such practice should help them gain in confidence, build up mental stamina to listen to English for long periods, provide a sense of purpose and add interest to school learning. This, of course, presumes that access to English outside school in Hong Kong is an easy, trouble-free affair and that pupils will enthusiastically avail themselves of opportunities to improve their English. These are important considerations, for learners will only profit from exposure outside school to a language taught in class if they themselves actively seek such benefits (Krashen, 1982; Pica, 1987).

Learning a language with little chance to practise it can be a solitary affair and learners of grammar, syntax and semantics who do not actively participate in the acquisition process rarely make successful linguists (Bowerman, 1978). With this in mind, Carroll (1986) proposes that the linguistic proficiency both of foreign language students and their teachers will be enhanced if time is spent in a

country where the target language is spoken. Thus, schools in the United Kingdom organise overseas visits for pupils and language teachers often spend vacations and periods of study in countries where the language they teach is used. One would therefore expect teachers from Hong Kong at university in England to improve their general English competence and to experience aspects of life and culture which would enrich their knowledge about England and the British people. Their stay in England should also help them acquire colloquialisms and give them the confidence to speak English without inhibition. Although these general expectations are entirely plausible, there has been little research looking at the specific linguistic gains made by Hong Kong students at university in England (Dolan & Lo, 1990).

The Understanding of Speech: Cognitive Constraints

The ability to follow and comprehend speech is good evidence of facility with a foreign language, but it is a competence that is quite complex and not simply a matter of registering like a tape recorder every word heard. Baddeley (1990) proposes that listeners first file speech in a short-term phonological store, holding it there by articulatory rehearsal. The choice of words and phrases retained

is largely determined by cognitive control systems. Pioneering research by Miller (1956) showed that people can hold in short-term memory (STM) only a limited amount of information at any one time, and Marks and Miller (1964) and Kintsch (1974) found that complex sentences are hard to hold in mind whilst one is considering what they mean. When sentences are so long they exceed STM store, the control processes cited by Baddeley distil and file only the essence or the outstanding words of what is heard. The same applies with text comprehension. Van Dijk and Kintsch (1983) showed that what is read is seldom stored in memory in words identical to those on the page. Instead, readers convert messages into images, propositions or verbal encodings to represent what they have understood from sentences and short sections of text, 'microstructures' as Kintsch calls them. They then assemble these in long-term memory (LTM) as a mental 'macrostructure' or gist of what has been understood.

Whilst LTM seems boundless, STM capacity is so limited that Kintsch (1987) has estimated that the number of propositions which can be held there is at best only six. In other words, if sentences are so long or involved that one is unable to carry forward all the information registered to ensuing sentences, complete understanding is unlikely. It is doubtful whether the brain has two independent systems, one for processing speech and one for dealing with text, so it is reasonable to assume that listeners too will respond selectively to what they hear. To illustrate the point, consider what might happen when one hears the following three sentences:

1. "There are thousands of cars on the busy streets of Hong Kong."
2. "These cars include Toyotas, Nissans, Hondas, Mazdas, Mitsubishiis and Benz."
3. "Cars used as taxis are usually economic to run and easy to manoeuvre, so cheaper Japanese cars are preferred to the larger, more expensive Benz cars."

The sense of what is heard is acquired by holding in STM the incoming words in each sentence whilst representations are being abstracted and one's previous knowledge and experience are being called upon to help one draw inferences and compare these with what one already knows (Lunzer & Dolan, 1979). As Bartlett (1932) suggests, remembering has a reconstructive nature, with people intelligently trying to impose sense on what they are presently hearing as well as on what they think they have heard previously. They are continually reducing messages heard into simpler forms which, once encoded, may

be used to help reconstruct what has been said. Thus the above three sentences might be reduced to:

1. "Many cars / Hong Kong"
2. "Japanese cars / Benz"
3. "Japanese cars economical / manoeuvrable / so used as taxis".

In short, seeing that one's limited STM precludes the holding in mind of all the propositions or encodings needed in order to solicit the general meaning in discourse, one is continually having to build up comprehension in a series of processing cycles, bit by bit. Success is most probable when the schemata involved, mental templates of experiences and concepts against which new input may be compared, are familiar.

The Understanding of Speech: Linguistic Constraints

Lunzer (1979) contends that knowledge of grammar, syntax and semantics facilitates the parsing of discourse whilst listeners are seeking the gist of what is heard. And, of course, the more they know about the topic in the first place, the easier it is to sort out what is new from what they already know. Linguistically sophisticated, well-informed listeners strategically pick reasonable prospects to hold in STM, whereas less expert listeners may settle on unimportant detail, quite unrelated to what appears in subsequent sentences, or may vainly try to remember everything. When this happens, the conceptual linking of the elements in the discourse usually yields a misrepresentation of what has actually been said. In contrast, listeners having few problems with the vocabulary and grammatical forms of the language, for example with their mother tongue, can suspend judgement when inconsistencies and breaks in coherence occur. They are also very adept at drawing upon meanings residing in the various sections or phrase boundaries of sentences and using these to facilitate STM encoding and chain concepts together. In other words, they are less likely to misrepresent to themselves the essential details of what has been heard.

When listening to a foreign language, people frequently encounter unknown vocabulary and are often uncertain about how to split what they hear into coherent segments. With practice, they learn to ignore words which for the moment add nothing to the overall meaning and to press ahead regardless, valiantly holding on to the main theme. However, confidence is soon shaken when words in sentences they are hearing do not seem to follow on in any

sensible way and when subject matter is unfamiliar. When they find it impossible to grasp the thread of meaning in what they hear, many become discouraged and give up. And, once confidence has been lost, it is very hard to restore. These language learners typically claim greater competence with reading and writing than listening and speaking (Perera, 1984).

Exposure to an 'English' Environment: Potential and Actual Benefits

Dolan and Lo (1990), examining the ability of students at university in England to grapple with complex text, found those from Hong Kong to be very assiduous and determined in their efforts to understand what they were reading. The longer they had lived in England, the greater their confidence and tenacity with the task in hand. It was also found that general comprehension improved the longer the students had lived in England and that the most notable progress was made in the area of coming to terms with texts set against local backgrounds. It was concluded that progress was closely associated with increasing sensitivity to 'British' schemata, language forms and style.

The present research centred on listening comprehension and sought to trace the build-up of competence associated with prolonged exposure to English as a result of studying in a British university. Fairly long sentences, some with United Kingdom and some with Hong Kong background themes, were given one at a time to Hong Kong teachers of English, who listened to each one and wrote down what they thought they had heard. One group had never been to England, one had studied there for three months and one for nine months. The sentences were also presented to native English-speaking undergraduate students in the United Kingdom. It was predicted that (a) all subjects, regardless of ethnic background, would have superior recall of sentences with schematically familiar themes, and (b) recall of the 'English' sentences by the Hong Kong groups would improve in line with the length of time spent living in an English environment.

Method

Subjects

The sample consisted of Nottingham University undergraduates from the United Kingdom and from Hong Kong. Twenty United Kingdom students

were selected at random from halls of residence. Subjects in the Hong Kong groups were randomly selected from three cohorts: 64 teachers who had never been to England and who were attending a bridging course in Hong Kong prior to admission to an in-service B.Ed. course for teachers at Nottingham; a similar group of 40 teachers already on the course and who had lived in England for three months; and a third group of 40 who had been on course for nine months. Each teacher had between three and ten years' teaching experience and all were qualified to teach English in Hong Kong.

Material

Sixteen sentences, 8 with British and 8 with Hong Kong background themes (see Appendix A), were specially composed so as to be a little too long to recall comfortably, for example:

7. The police breathalyse many motorists in the Christmas season, especially in Nottinghamshire and Derbyshire.
3. The Star Ferry is quite slow but it is a pleasant way to cross the harbour from Central to Tsim Sha Tsui.

Pilot work with Hong Kong teachers established that the sentences were meaningful and that the Hong Kong sentences addressed themes generally familiar to Hong Kong people. The sentences were then randomly arranged and recorded onto audio cassette by a British woman with a standard educated English accent and very clear diction, delivery being at a slightly slower than normal pace and with appropriate intonation. The lady is a frequent visitor to Hong Kong and her pronunciation of Hong Kong place names is impeccable.

Procedure

Subjects were seated at desks in a quiet room and a high-fidelity audio recorder placed before them. The purpose of the study was outlined, the procedure explained and practice items given, with close attention paid to ensuring that all could hear clearly. When all subjects were practised in how to respond, they were then asked to listen to each sentence one-at-a-time from the tape and write it down as accurately as they could. Told that spelling was not important, they were advised to signal with a blank space any words they could not recall and to take as long as they wished to complete each sentence. When it was obvious that every subject had completed each response, the experimenter then presented the next sentence via the tape recorder.

Scoring

The writer and two assistants marked each script independently. No marks were deducted for spelling errors or mistakes with place names. When a difference in scoring arose, all three markers discussed the response in question until agreement was reached. The scoring system used appears in Appendix B, perfect recall of a sentence earning 6 marks.

Results

An item analysis was applied to all 16 items on the test and to the United Kingdom and Hong Kong items as separate scales. Internal consistency estimates in the form of Cronbach's alpha co-efficient calculations for each item ranged from 0.8776 (Sentence 8) to 0.9459 (Sentence 9). Cronbach's alpha for the scale overall was 0.9677, for the United Kingdom scale 0.9773 and for the Hong Kong scale 0.9483, an indication that the data were internally consistent and reliable.

Table 1
Summary of overall performance

Group		Total UK scales	Total HK scale	Total UK+HK scale
HK 1	M	15.89	33.62	49.51
n = 64	S.D.	4.63	5.71	9.25
HK 2	M	18.22	29.97	48.19
n = 40	S.D.	7.36	9.11	15.98
HK 3	M	25.22	34.22	59.44
n = 40	S.D.	6.72	8.59	14.57
UK	M	39.90	34.75	74.65
n = 20	S.D.	5.23	6.02	10.53
One-way ANOVA	F-ratio	88.40	3.01	24.80
	<i>p</i>	<.01	<.05	<.01

HK 1 = Hong Kong Group 1 - never lived in England
 HK 2 = Hong Kong Group 2 - lived for three months in England
 HK 3 = Hong Kong Group 3 - lived for nine months in England
 UK = United Kingdom Group

Table 1 summarises the raw score performance of the four groups on the two national scales and the score overall. As may be seen, the analysis of variance yields F-ratios which are all statistically significant. The differences are particularly marked on the United Kingdom Scale, with performance increasing in line with the length of time exposed to English full-time in the environment, the lowest mean score being gained by the group still living in Hong Kong. Predictably, the United Kingdom group recalled these sentences much better than their

Hong Kong counterparts. As may also be seen, recall of Hong Kong sentences saw less variability between the groups, the weakest group being those teachers who had been in England for three months already. Combining the raw scores for the two sub-scales produces a highly significant analysis of variance. Generally, the United Kingdom group tended to recall sentences better than the Hong Kong groups, with the performance of the teachers still in Hong Kong doing the worst and the performance of the Hong Kong groups in Nottingham improving in line with the length of time they had spent there. This trend applies especially to sentences with United Kingdom schemata.

To test the significance of patterns in the performance, linear trend testing was applied to the means of the three Hong Kong groups, the analysis being summarised in Table 2. Even though the difference in the size of groups may have influenced the trend analysis and thus imposed some limitation on the strength of the interpretation (see Youngman, 1979), the trend seems clear. On the United Kingdom scale and the scale overall, the pattern is for performance to improve systematically in line with length of stay in England. This trend does not apply to the Hong Kong scale.

It had not been anticipated that time spent in England would significantly affect the Hong Kong teachers' ability to recall sentences with Hong Kong schemata. However, there was uneven performance between the groups, with those teachers who had spent only three months in England performing less well on average on the Hong Kong scale than their compatriots. In order to take account of sampling differences between the Hong Kong groups, the total scores for all subjects on the Hong Kong schemata scale were used in a regression analysis to predict scores on the total scores for the United Kingdom items. Ipsative scores were then calculated for each subject by subtracting what was predicted from what was obtained and standardising the differences around a mean of zero. Hence, a positive score indicated better than and a negative score worse than anticipated performance. These scores were then subjected to analysis of variance.

Table 2
Linear trend analysis (linear regressions)

	Total UK	Total HK	Total UK+HK
Regression sum/squares	8446.60	33.96	9551.60
F-ratio	229.30	0.60	57.88
<i>p</i>	<.01	n.s.	<.01

Table 3
Analysis of variance of ipsative scores

Group	Residuals	
	M	S.D.
HK 1	-6.20	3.92
HK 2	-1.31	3.48
HK 3	2.72	3.98
UK	17.02	3.48
One-way ANOVA		
F-ratio	195.76	
<i>p</i>	<.01	

HK 1 = Hong Kong Group 1 - never lived in England
 HK 2 = Hong Kong Group 2 - lived for three months in England
 HK 3 = Hong Kong Group 3 - lived for nine months in England
 UK = United Kingdom Group

Table 3 summarises the analysis of variance applied to the residual scores produced by the regression analysis. The F-ratio is highly significant and the trend is clear. With reference to their mean recall of Hong Kong sentences, the Hong Kong 1 group did much worse than expected on recalling sentences with United Kingdom background; the group who had been in England for up to three months (Hong Kong 2) also fared worse than expected; the Hong Kong 3 group, who had been in England for nine months, were better at recalling English sentences than anticipated. Predictably, the UK group were much better with the United Kingdom than Hong Kong sentences.

Discussion

The results suggest that the schematic background of the sentences significantly influenced their recall: both national groups did best on sentences which were schematically familiar, and the recall of the United Kingdom sentences by the Hong Kong teachers improved in line with the degree of exposure each group had had to an authentic English environment. As expected, the United Kingdom sample outperformed their Hong Kong counterparts on all the United Kingdom and most of the Hong Kong sentences.

On the test overall, the Hong Kong group who had stayed the longest in England displayed clear superiority over the other two Hong Kong groups, the means for these latter groups being quite similar. At first, the unexpected finding that the second Hong Kong group seemed to have performed unimpressively triggered thoughts about a sampling artifact, given that the size of the sample was rather small, or that these teachers in their first three

months living overseas were experiencing an element of 'culture shock'. In fact, the regression analysis carried out to help partial out a priori differences which might exist between the groups cast the actual trends into much sharper relief. It revealed that the Hong Kong teachers' recall performance improved as they became more used to the English background and had had time to acquire 'British' schemata. It also highlighted the benefits of prolonged periods of exposure to English and general improvements in language proficiency.

Implications

As reported earlier, in an effort to improve language teachers' appreciation of the language patterns, accent and pronunciation of the target language, it is common practice in the West for them, and sometimes their pupils, to spend a period of time living in an environment which is saturated with the language they are teaching or studying. The hope is that exposure to authentic target language will help their language approximate more to that of native target language speakers. The evidence from both the present study and that conducted by Dolan and Lo (1990), also with Hong Kong teachers, would suggest that any period of stay needs to be quite lengthy, at least six months, for any substantial instantiation of schemata to take place or for general English proficiency to increase noticeably. One would argue that simply placing Hong Kong learners of English in locations where English is spoken will have relatively little effect unless they make active use of the environmental opportunities offered. If Hong Kong students living in England share flats with other Hong Kong students, speak Cantonese habitually and watch Cantonese videos, this is tantamount to leaving their lecture rooms and returning to Hong Kong every evening. Although desirable in that they offer insights into the culture of the people of other lands and generate interest in the language they speak, short stays abroad may be of limited value for language gains in the learner. At the same time, the benefits for comprehension of exposure to English in the environment are probably specific rather than general, perhaps being psychological in terms of confidence building and interest generation rather than linguistic alone.

The findings raise a question about whether English is a second or a foreign language in Hong Kong. A second language is generally employed interchangeably with the mother tongue in everyday discourse in society (McLaughlin, 1987) and is not restricted to government circles, official documents,

the legislature, mass media opportunities, tourism and trade as seems to be the case in Hong Kong. The teachers participating in the present study had lived for over twenty years in Hong Kong, had themselves been taught in schools in which English is supposed to be the medium of instruction, had been trained to teach and had taught in English, and all could be classed as elite members of Hong Kong society. As 'English as a Second Language' specialists, they might have been expected to be au fait to an extent with 'English' schemata. Admittedly, the unimpressive performance on the UK scale of all the Hong Kong teachers, particularly the group who had yet to visit England (see Table 3), was due in large part to their unfamiliarity with 'English' schemata. Surely, however, it also reflects the dearth of natural opportunities in Hong Kong for people to use English spontaneously outside the workplace, as would be the case if English were a true second language, and also the way English seems popularly to be regarded simply as a tool enabling its speakers to enter well-paid employment.

The findings of this investigation are in line with those from a number of studies carried out by the writer in his examination of the cognitive processes operating when people for whom English is not a native language try to recall discourse heard or read previously. Two general conclusions have emerged: that the fundamental processes of comprehension and recall do not differ significantly across speakers of different languages, but that the educational, linguistic, cultural and social background significantly affect the accuracy, amount and pertinence of detail remembered; and that once people have acquired a certain threshold of language competence, it is their confidence and disposition toward the task in hand which are most likely to lead to successful comprehension and recall.

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Appendix A

Sentences used in the experiment

1. The Atlantic often batters the Scottish coast in the winter months from November to March.
2. The M25 motorway was intended to relieve traffic in London but more bottlenecks have resulted.
3. The Star Ferry is quite slow but it is a pleasant way to cross the harbour from Central to Tsim Sha Tsui.
4. When top seeds are playing at Wimbledon exam revision stops for most students.
5. When a typhoon signal of eight is given on the television and radio all schools close.
6. Children expect lucky money packets during Chinese New Year celebrations.
7. The police breathalyse many motorists in the Christmas season, especially in Nottinghamshire and Derbyshire.
8. Trains are full at Ching Ming as people go to visit the graves of relatives and have a picnic.

9. Most families listen to or watch the Queen's address to the nation after Christmas dinner at three o'clock.
10. Hong Kong young people are often stopped in the New Territories to have their I.D. cards checked.
11. The Cockney accent and slang are difficult for Geordies to follow by people from Stepney.
12. Hakka hats are often worn by people at Lok Ma Chau near the Chinese coast.
13. The kilt is common in Glasgow but not among Celtic supporters at Hampden.
14. People who like Yorkshire pudding do not always like Lancashire hotpot.
15. Kai Tak is busy night and day and Kowloon city is a very noisy place to live.
16. Moon cake is eaten during the Mid-Autumn festival, especially in Victoria Park.

Appendix B

Summary of scoring system

6 marks - complete accuracy

5 marks - gist correct, 1 word wrong order or/and omitted

4 marks - gist nearly correct, 2-3 words in wrong order or/and omitted

3 marks - half correct

2 marks - less than half correct

1 mark - hardly any words correct