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THE COMPARATIVE EFFECT OF LANGUAGE USED IN RECALL PROTOCOL IN READING COMPREHENSION ZAIDAH ZAINAL

INTRODUCTION

This study raises the issue of language of protocol used as an instrument for data collection, particularly in a study of reading comprehension and strategies. The question raised is whether the language of protocol, either L1 or L2, will make a difference in the performance of readers when recalling information from a text. Protocol methods, unlike other testing methods, used in reading comprehension studies have intrigued many researchers because they indirectly reveal a reader's cognitive process when reading.

Alderson (2000) notes that the study of reading can be divided into two: the process and the product. The product of reading is concerned with what understanding of the text a reader has reached. This can be achieved through some form of a comprehension test. The process of reading, on the other hand, is concerned with how the reader reaches the understanding of the text. Alderson (2000: 3-4) notes that 'understanding the process of reading is presumably important to an understanding of the nature of reading, but at the same time it is evidently a difficult thing to do.' The fact that the reading process is a silent and private activity, methods such as think-aloud protocol, recall protocol or miscue analysis are used in many studies of reading.

Studies of reading comprehension have used a number of

different methods of collecting data, such as cloze (Koh, 1985), true/false statements (Clapham, 1996), multiple-choice questions (Kasper, 1996), short-answer questions (Hsiu & Grave, 1995) information transfer tasks (e.g. flow-chart or table) (Clapham, 1996), summary (Oliviera, 1988) and recall methods (Johnson, 1982; Lee, 1986 and Kobeil, 1999). The question arises as to the validity of these tests or methods in measuring the constructs in question.

Urquhart and Weir (1998) provided some criticisms regarding the testing methods used to measure reading comprehension, particularly gap-filling, cloze and multiple-choice questions. They claim that these tests focus on 'local comprehension at the microlinguistic level rather than global comprehension of ideas encoded by the writer across the text as a whole' (pp 157). While gap-filling and cloze seem to emphasise the perspective of reading as a bottom-up process of decoding words at local or sentence level, multiple-choice questions have other disadvantages, in particular, in potentially distracting the readers through the presence of different options which 'otherwise might not have been thought of' (Urquhart and Weir, 1998). In the case of multiple-choice test, Bernhardt (1991) notes that the readers may be able to guess a correct answer without reading the texts, indicating that multiple-choice questions may not be measuring readers' comprehension of the text.

The methods discussed above tend to measure comprehension in terms of the product but not the process of reading. For this reason, results from these tests may not reveal how a reader comprehends a text either at a local (or sentence level) or at a global level. Since our study focuses on the cognitive processes of the readers, this researcher selected verbal protocol method as the research tool.

VERBAL REPORTS

Verbal reporting is often used to gather information regarding a person's mental processes as 'the workings of the human mind cannot be observed directly the way other objects of scientific

endeavours can be.’ (Jaaskelainen, 1995). Three common terms are assigned to describe the mental processes of a learner: Introspection, Retrospection and Think-aloud protocols.

According to Nunan (1992), *Introspection* is the process of observation and reflection ‘on one’s thoughts, feelings, motives, reasoning processes and mental states with a view to determining the ways in which these processes and states determine our behaviour’. *Retrospection*, sometimes referred to as delayed recall, on the other hand, refers to reports which describe the cognitive processes of a person after he/she has performed a task (Ericsson and Simon, 1980; Jaaskelainen, 1995; Kobeil, 1999). *Think-aloud protocol* refers to the process through which the readers verbalise their thoughts while processing a text. They are encouraged to disclose everything they think about, whether ‘related to a task or not’ (Rankin,1988). Jaaskelainen (1995) notes,

thinking aloud differs from classical introspection and retrospective responses to specific probes in that thinking aloud is undirected and concurrent. In other words, when thinking aloud is used to elicit data, the subject is not, as a rule, required to verbalise specific information, and the verbalisations are produced simultaneously with the task performance.

In the past, these verbal reports have received criticisms regarding their reliability as research instruments (Nisbett and Wilson, 1977). Nevertheless, these instruments have gained ‘respectability’ as research tools due to efforts in providing models and guidelines in establishing their reliability (see Ericsson and Simon, 1980).

THINK-ALoud AND RECALL PROTOCOLS

The think-aloud tasks used in real-time comprehension processes studies can be categorised into three kinds: sentence-by-sentence

talking, selective talking and after-the-fact talking (Olson *et al.*, 1984). In sentence-by-sentence talking, a subject is required to talk after reading each sentence of a text. In selective talking, the subject verbalises his thought at a certain point of the text. In after-the fact talking, the subject verbalises his thoughts after he has read a text (cf. retrospective method). Of the three, sentence-by-sentence talking is most popularly used in reading comprehension research because it reveals the reader's real-time cognitive processes and does not heavily depend on the reader's LTM. Furthermore, it is suitable for investigating a reader's strategies and comprehension process of long and complex texts.

Recall protocols also come in several forms depending on the task or the type of readers who participate in the study. For instance, Kobayashi's (1995 cited in Urquhart and Weir, 1998) notion of recall protocol covers a range of modes. She suggests that:

Recall protocols can be classified as either oral or written in terms of the language mode, or either immediate or delayed in terms of time of recall, or either free or probed, i.e. with or without cues for recalls. (cited in Urquhart & Weir, 1998: 166)

Generally, studies employing recall protocol as a measure of reading comprehension incorporate a wide range of recall types as outlined by Kobayashi (1995). For example, Gambrell and Koskinen (1991) employ immediate, oral and free retelling of stories after subjects (L1) have read four texts, while Bernhardt (1991a) employs immediate written and free recall in measuring the reading comprehension of L2 subjects.

Fransson (1984) also provides three categories of recall which relate to the different approaches adopted by the reader in recalling the text, namely,

- *Mentioning-type*: briefly mention the points discussed by the author

- *Description-type*: provide moderate description of the points in the text
- *Conclusion-oriented type*: provides conclusions when discussing problem or concept.

These recall types may indicate whether a subject is a surface level reader or a deep-level reader. Readers who tend to use the *mentioning-type* and *description-type* of recall are considered as surface-level readers. They usually fail to see the connections between the facts in the texts, such as how information presented in a diagram can be integrated with the texts. Of these two types of recall, the *description-type* is considered more extensive than the *mentioning-type*. The *conclusion-oriented* type of recall, on the other hand, is produced by deep-level readers who tend to search for conceptual meanings of a text.

ADVANTAGES AND DISADVANTAGES OF PROTOCOL METHODS

Both think-aloud and recall protocols have a number of advantages as research tools in studies of reading comprehension and strategies. The advantages of these methods mostly stem from their unique role in revealing the cognitive processes of a reader. Rankin (1988) notes that the think-aloud method differs from introspection or retrospection, in that in the latter methods the reader basically responds to prompts, making him/her to report selectively according to the prompts. However, in think-aloud procedures the reader indiscriminately talks about his thoughts, whether related or unrelated to the reading texts. It is the role of the researcher to analyse any emerging patterns from the data rather than the subject becoming the analyst of his own cognitive processes (Jaaskelainen, 1995). In contrast to methods which use specific prompts, the think-aloud method ‘is likely to capture more of the process (less is forgotten) more reliably (less is distorted)’

(Jaaskelainen,1995). Similarly, the recall method is able to reveal the cognitive processes of the readers which other methods may not be able to. In contrast to testing methods such as multiple-choice or cloze, the recall protocol is not directed by the questions set by the researcher but rather is directed by the readers' own understanding of the text.

Think-aloud and recall methods also take into consideration the interaction that takes place between a reader and a text, or a reader and a writer (Rankin, 1988). A reader is free to question and judge the text information, to predict the forthcoming content on the premise of earlier content or even to criticise both the content and the writer of the text. The interaction between participants and texts fits in with the notion that reading is not an unidirectional passive process. Other data elicitation methods using testing procedures such as multiple-choice questions or cloze procedures which are extremely product-oriented do not do this. In general, think-aloud and recall protocols allow the reader to reveal his cognitive processes and interact with the meaning of the text and the writer.

Despite these advantages, think-aloud and recall protocols have some limitations. One of the issues is whether these methods can really elicit complete information about the conscious and unconscious cognitive processes of a reader. While the conscious processes may manifest themselves in the think-aloud or recall, the unconscious processes largely remain hidden, inaccessible and 'probably unreportable' (Jaaskelainen, 1995: 218). Likewise, recall protocol, either written or verbalised, may not really be representative of the subject's total understanding of the text since the subject may know more than has been recalled. Therefore, results based on the recall data may misrepresent the actual level of comprehension.

Another limitation of think-aloud and recall methods is that they are easily moulded by prompts and instructions (Pressley and Afflerbach, 1995). In studies which investigate a subject's text processing, prompts aimed at getting specific answers can lead to the skewing of the data (Pressley and Afflerbach, 1995). Furthermore, the think-aloud method, in particular, potentially has an intrusive effect.

By requiring a subject to think-aloud after reading each sentence of the text, the reading process becomes unnatural. The subject's think-aloud may intrude in the otherwise continuous reading process.

With reference to recall protocol, the time gap between the reading task and the recall task may be a problem. A researcher like Bernhardt (1991) strenuously supports the use of immediate recall protocol to measure subjects' reading comprehension, since delayed recalls may result in interference of knowledge from other sources outside the text. In addition, delayed recalls may also cause subjects to forget some information in the text.

Sometimes, ideas verbalised are fragmented and disjointed and do not really disclose the actual meaning that was intended. Interpretation of data collected through these methods is merely the result of the researcher's inferences. In addition, differences in text processing can also be seen between L1 and L2 readers or readers from different proficiency levels.

LANGUAGE OF PROTOCOL

One issue regarding think-aloud and recall protocols which remains unresolved is the problem of the language of protocol. In the 70's and early 80's, many studies of reading comprehension using recall protocol tend to use L2 as the language of the protocols. This was partly due to their focus on how L2 or foreign students read texts written in English (see Steffensen *et al.*, 1979; Carrell, 1984).

However, Lee (1986) conducted a study with Spanish subjects, with the aim of testing the effect of using L1 and L2 as the language of the recall protocol. Results suggest that there was a main effect of the language of protocol on the quantity of idea units in the recall. Lee concludes that more information is yielded from subjects when their protocol was conducted in L1 than L2. This finding is supported by Donin and Silva's (1993) study which indicates that subjects tend to recall less material in their L2 (French) than in their L1 (English).

Further studies conducted by Roller and Matambo (1992) and Upton (1993) yield different findings regarding the language used in the recall protocol. In Roller and Matambo's study, which replicated Carrell's (1983) study, the subjects were found to recall better in their L2 (English) than in their L1 (Shona). Although this seems to support Carrell's (1983) findings, they caution that the result may be due to the high L2 proficiency level of the subjects involved in their study.

Upton's (1993) investigation with Japanese students produced very different findings regarding the effect of the language used in the recall. Upton's findings suggest that there is no difference in comprehension as revealed by the subjects' recall, when the subjects use their L1 or target language. The subjects' comprehension did not appear to differ according to the language used in their recall. It can be claimed at this point that the issue of language of recall remains unresolved. Further investigations need to be conducted in order to ascertain the effectiveness of recalling in L1 over L2 or vice versa.

METHODOLOGY

The subject of this study comprises 30 third-year TESL students from Universiti Teknologi Malaysia. They were required to read two short texts of about 450 words and write their understanding of the texts in Malay for the first text and in English for the second text. All the subjects were Malay students.

The written protocols or retrospection was analysed according to meaning preserving idea unit analysis (Johns and Mayes, 1990). Six types of Meaning Preserving (MP) idea units are identified: MP1 (replicating idea units or sentences), MP2 (paraphrasing/summarising), MP3 (combining idea units within paragraphs), MP4 ((combining idea units across paragraphs), MP5 (text or paragraph generalisation) and MP6 (inferencing or using background knowledge but preserving the meaning/gist of the text).

This study attempts to find answers to the following research question:

- Is there a difference in performance when the subjects recalls the texts in English and in Malay?

RESULTS

Table 1.0 shows the frequency of Meaning Preserving Idea Units produced by the students in Malay and English.

Types of Idea Units	Malay	%	English	%
MP 1 –replicating IUs or sentence	664	8.4	837	15.11
MP2 – paraphrasing/summarising	4987	63.5	3190	57.6
MP3 – combining IUs within paragraphs	156	1.98	120	2.17
MP4 – combining IUs across paragraphs	98	1.25	111	2.02
MP5 – text or paragraph generalisation	583	7.42	344	6.2
MP6 – inferencing or using background knowledge but preserve meaning/gist of text	1365	17.38	935	16.9
Total number of Idea Units	7853	100	5537	100

Table 1.0 : Distribution of Idea Units

In the case of protocol in L1 (Malay), three types of idea units had relatively higher proportions; MP2 – paraphrasing/ summarising (63.5%), MP5 – text or paragraph generalisation (7.42%) and MP6- inferencing or using background knowledge but preserve the meaning/gist of text (17.38%). The results from the protocol in L2 (English) also shows three types of idea units with relatively higher proportion than the protocol in Malay, although the difference is

not significant; MP1 – replicating IUs or sentence (15.11%),MP3-combining IUs within paragraphs (2.17%) and MP4-combining IUs across paragraphs (2.02%).

The highest percentage of idea units for protocols in L1 (Malay) (63.5%) and in L2 (English) (57.6%) is MP2 (paraphrasing/summarising). This indicates that subjects attempted to comprehend and interpret the meaning of the text through paraphrasing or summarising. In comparison to English, the Malay protocol yields more MP2. This suggests that while focusing on the reproduction of idea units at local or sentence level, they also tend to produce idea units that are at the macro-propositional level. The production of more MP2 was possibly facilitated by their proficiency in L1 than in L2, assisting fuller comprehension of these texts. A higher percentage of MP2 in L1 than in L2 suggests that subjects demonstrate their conceptualisation of the meaning of the text by paraphrasing and summarising.

Results of MP6 idea units (making inferences/using background knowledge) also show a high percentage for both protocols, with slightly more units being produced in L1 (Malay) (17.38%) than in L2 (English) (16.9%) protocols. This type of idea unit reflects the subjects' use of relevant inferences to explain their better understanding of the text in L1 than in L2.

In contrast, results show that subjects tend to produce more MP1 idea units (replicating IUs or sentences) when they recall in L2 (English) than in L1 (Malay). Replication of text may occur for two reasons; firstly, the subjects might perceive that some of the text information or concepts were important but could not rephrase the information using their own words in their L1; and secondly, they might purposely avoid paraphrasing the text using their own words in order to prevent losing the original meaning of the text. Although this researcher notes that memorising may not necessarily mean comprehending, it appears to be one of the learning behaviours adopted by the students. In Johns and Mayes' (1990) study with respect to summary writing, the same behaviour was reported.

Overall, the results show that the number of idea units of

protocol in L1 (Malay) is higher than that in L2 (English), indicating that the students were able to recall more idea units in their L1 than in L2.

There may be two reasons why the results are such. Firstly, this can be explained through the concept of interdependence hypothesis which suggests that subjects are able to use both languages to recall the text, and that their higher proficiency in L1 (Malay) assists them to produce more idea units in L1 (Malay) than in L2 (English), although in general they may not have problems in conceptualising the meaning of the texts. Secondly, this can be explained through the interaction that takes place between a reader and the texts. In this case, the readers may feel freer to question, predict or explain the information in the text, in their L1 than in L2.

CONCLUSION

In conclusion, this study suggests that protocol methods can be used as a tool to collect data in reading comprehension study. The protocol methods have the advantage of revealing the cognitive processes of a reader, besides the interaction that occurs between the reader and the texts. This interaction between participants and texts fits in the notion that reading is an active process.

As reading is a complex process involving both lower level and higher level processes, the protocol methods enable researchers to investigate the levels of processes, such as making inferences, paraphrasing, summarising and using background knowledge. The methods are said to be the best methods to capture the higher level processes as they come to consciousness while the reader is processing the text.

Results from this study suggest that subjects produced more idea units when they verbalised their understanding in L1 than in L2. These results support the finding of Lee's (1986) study which promotes that readers tend to recall better in L1 than in L2.

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