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ABSTRACT

A study used the think-aloud method to determine how adult learners beginning to learn a second language through oral input construct meanings, and what processing behaviors they engage in to help them construct future meanings more effectively. The subjects, 5 adult undergraduate and graduate students aged 23-55, were taught 20 Hindi lessons individually using the Total Physical Response method. Each lesson contained about 50 utterances, some of which were reviews of constructions already studied. The subjects were asked to think aloud and self-report when they were having difficulty during a teaching session. Sessions were videotaped, transcribed, and analyzed for patterns. Qualitative and quantitative differences in the strategies used to build on prior learning were found in all subjects, and five distinct styles emerged. Strategies included: focusing on single words; analyzing input into content of words and using pragmatic knowledge to determine meaning; translation; focusing on sentence constituents; processing in Hindi without resorting to translation; translating constituent parts when too complex for second-language analysis; separating the utterance into "chunks" before analysis of constituents; gestalt approach, with little conscious linguistic processing; induction of grammatical rules; inference by process of elimination; and repetition. (Contains 33 references.) (MSE)

HOW DOES ONE LEARN A SECOND LANGUAGE? LET ME COUNT THE NUMBER OF WAYS

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Gouin, frequently reverrred to as the founder father of language teaching methodologies, has described his somewhat painful experiences of learning German. He attempted to memorize a book of grammar and a table of irregular verbs. But to no avail. Then he attempted to learn the German roots also. Again his efforts met with a singular lack of success. He even attempted to memorize a dictionary, but none of these methods lead to the point where he could comprehend the German language when it was directed to him in a communicative situation (Brown, 1987).

Stevick (1982) describes how he tape-recorded interviews with seven different language learners who had been successful at learning a second language. He was astonished by the remarkable variations in the approach to the task of language learning as reported by these students. Each student considered the way he or she had learned was the natural way to learn a SL.

Naiman et al (1978) similarly found differences as well as similarities in the way their subjects reported they approached the task of learning another language. There was a complex interplay of personal and contexual variables in their language learning experience.

Much of the work arising out of the emphasis on learners has tended to focus on strategies that they use in order to learn a language and whether these strategies lead to more efficient SLL. Among the good language learning strategies suggested were: *inferencing* (Twadell, 1973; Stern, 1975), *looking for patterns in language, monitoring*, in a wider sense than that used by Krashen (1982), *paying attention to all aspects of language learning* (that is, form, meaning, communication and creativeness), and *willingness to practise* (Stern 1975, Rubin 1975).

Following these suggestions, attempts were made to determine the effects of some of these strategies, such as inferencing, and practising, on achievement (Bialystok 1979, 1983), to draw up a taxonomy, such as processes that may contribute directly or indirectly to learning (Rubin 1981), to relate them to language acquisition (Politzer & McGroarty, 1985) and whether learners can be taught to use stragegies (Bialystok 1983, O'Malley et al., 1985, O'Malley 1987).

Research in the late 70s and early 80s focussed on individual strategies and how they correlated with achievement scores (Bialystok and Fröhlich 1977; Bialystok 1983) or which strategies reported by subjects correlated with achievement (Politzer 1983; Politzer and McGroarty 1985; Ramirez 1986) or reported frequency of use of certain strategies correlated

with criterion measures (Bialystok 1979). These studies were all dependent upon self-report, and this, as Politzer (1983) points out "may only partly reflect true behaviours" (p. 62).

A more recent study has used factor analysis on self-reported strategies. Five key factors were derived, each one representing a set of strategies: viz. (1) general study habits, (2) functional practice, (3) search for communication of meaning, (4) studying or practising alone, and (5) mnemonic or memory devices (Oxford 1986). These factors accounted for the greatest amount of variation among the respondents in terms of the frequency with which specific strategies are used.

There has been considerably less work done in oral reception strategies, largely because of the difficulty in acquiring data that can address what are basically internal and unobservable activities. The study that is described below uses the think-aloud method to determine how adult learners, beginning to learn a second language through oral input, construct meanings, and what processing behaviours they engage in to help them to construct future meanings more effectively. It shows how learners approach this task and the differences amongst their approaches.

THE STUDY

METHODOLOGY USED TO COLLECT THE DATA

As mentioned earlier, little work was done in the area of reception strategies because of methodological difficulties in determining what were largely internal, unobservable activities. Recently, however, a research tool, the think-aloud method, has gained acceptance amongst researchers and it goes some way towards overcoming these problems.

Ericsson and Simon (1980, 1984) have developed a model for verbalization processes of subjects under different conditions. They distinguish between two types of verbalization: concurrent and retrospective. The veridicality of the data using the latter method is dependent upon the time lapse, and the number of intervening cognitive processes, as well as the type of directions given to subjects to recall previous cognitive processes.

In terms of concurrent think-aloud, what is available for verbalization is the content of the S-T memory. In the case of language input, where there is an immediate match between the input and the hearer's ability to decode it for meaning, there may be no verbalization because of the rapidity of such processes. Any verbalization obtained in such cases is likely to be a report of the end result of a process that has already taken place, the intermediate steps between the intake, the portion of input heeded to, and the final result being unavailable for verbalization. However, when automatic processing runs into difficulties, the normally rapid and covert mental processes are brought into "sufficiently deliberate use that relevant kinds of self-report data may be

obtained" (Scardamalia and Bereiter 1984: 1). Such data would reveal the processing behaviours of individuals and the strategies they employ in order to arrive at the meaning of an utterance, for example.

Concurrent think-aloud (T-A), as well as retrospection was used in this study. In addition, subjects were also asked to "self-report". This tended to occur at the end of the teaching sessions.

SUBJECTS

The five subjects who participated in this study were all adult volunteers who were undergraduates or graduate students at the University of Toronto and Ontario Institute for Studies in Education. The first language of four of them was English. The fifth subject's first language was a dialect of Chinese, Hokkien. Given below are brief sketches of the subjects.

- Anne was 25 years old and had just completed a degree in linguistics. She knew four other languages at varying degrees of proficiency: German, French, Mandarin and Turkish.

- Barry was a 23 year old undergraduate doing a B.A./B.Sc. in International Development Studies in Forestry. He stated he had very limited knowledge of Indonesian, French and Urdu.

- Cathy was 55 years old who was doing doctoral studies in Topology and Fine Art. She knew conversational French and some words of Czech.

- Danny was 26 years old and was a science graduate. Apart from his mother tongue (Hokkien) and English, he listed other languages he knew as Cantonese, Mandarin, French and Spanish, the last two at a fairly elementary level.

- Eric was 42 years old doing a doctorate on the topic of "Peace and Consciousness Evolution". He had done some high school French many years ago.

METHOD OF TEACHING

The subjects were taught 20 Hindi lessons of approximately half an hour on week days for 4 weeks. Each was taught individually using the Total Physical Response (TPR) method advocated by Asher (1969, 1982). TPR was used for two reasons. It has been claimed that it provides comprehensible input to learners (Krashen 1982), and secondly, each utterance is discrete and 'comprehensible' without its meaning being dependent on previous or subsequent utterance(s). No attempt was made to provide grammatical explanations or to provide translations of the utterances.

The teaching procedure varied from that described in the literature on TPR in that instruction was carried out on a one-to-one basis.

THE TEACHING CONTENT

There were 50 utterances planned for each session and these were presented to all the subjects. Of these 50 utterances, the first ten revised vocabulary items and new structures introduced in the previous session. A subject who had difficulties with a structure that had been covered previously, or had just been introduced, was given a few extra utterances with that same structure before proceeding with the planned lesson. The planned utterances were kept constant for each subject, but the temporal rate at which they progressed through each session was left flexible.

THE DATA COLLECTION

Before the first session, subjects were given practice in thinking-aloud while doing problems, along the lines suggested in Ericsson and Simon (1984).

Whenever there were lengthy silences during the teaching sessions, subjects were reminded to keep talking. On those occasions when it was noticed that subjects had some difficulty in getting the meaning of an utterance, or alternatively, they had got the meaning when it was expected to be problematic, subjects were probed to report on where the problem lay, or how they had arrived at the meaning. These probes produced the immediate retrospective data.

At the end of some of the teaching sessions the subjects were encouraged to talk about the experience they were undergoing. These responses produced the third type of data.

All sessions and verbalizations were audiotaped using a lapel microphone and a lengthy lead that enabled subjects to move freely about the room. The instructor also carried a lapel microphone.

The data or the audiotapes were fully transcribed for each subject. No attempt was made to transcribe phonological variations in pronunciation.

RESULTS

It was evident in the data that there were differences in the behaviours of the subjects along two dimensions: quantitative and qualitative. Certain behaviours occurred more frequently amongst some learners than in others. These quantitative differences have been reported elsewhere (Mangubhai, 1991). For example, Barry and Eric focussed considerably more on single words as they attempted to construct meanings than did the other three. They did this, however, for quite different reasons, as their retrospective reports (#1 and #2) show.

(1) Well I hear it (the plural morpheme -*yā*) but I ignore it. I just stick to bare bones.

(Barry/Session 7)

(2) I have a guess at what you want [me] to do but I would prefer to just work through the ... command.
(Eric/Session 7)

Barry's strategy to meaning construction was to strip the input to content words (cf (Shapira 1978) and use pragmatic knowledge to determine the meaning of an utterance as quote #1 and the following concurrent and retrospective reports indicate.

(3) T: *Ab kutte kā ek peṛ pāni me dāliye.* [= Now dip one of the dog's feet into the water.]
B: Feet.
T: *Kutte kā ek peṛ pāni me dāliye, thande* [= cold] *pāni me dāliye.*
B: ... dog and ... cold water cup ...
T: *dāliye*
B: ... in. Put the dog in the cold water?
T: *Kutte kā ek peṛ.*
B: My feet
T: *pāni me dāliye*
B: Stick my feet in the cold water.
T: *Nā, kutte kā ek peṛ*
B: ... the dog's feet.
T: *Ek* [= one, a] *peṛ*
B: One ^ (Barry/Session 17)

(4) B: I guess you want me to tell you how I thought that out, eh? ... O.K. I heard 'pencil' I heard 'table' ... 'on the table', then heard 'they're already on the table', so I couldn't put them on again. So I think I heard you say *gerd*?
T: *giniye* [= count]
B: *giniye*, which is count. So count the pencils on the table.
(Barry/Session 9)

(5) I don't know what the construction is. I just listen for the words. (Barry/Session 11)

It was a very efficient strategy at the beginning of the sessions because it enabled him to perform the required actions quite rapidly. In later sessions he realizes that he would eventually have to pay attention to structure words also.

Eric's strategy, as is evidenced in the concurrent T-A data (#6), and in his retrospective reports (#7) is to try to understand every word and piece these words together to get the meaning of an utterance. This was an approach that placed considerable burden on his memory and he frequently forgot parts of the command and had to ask for repetition. This resulted in frequent reports in his data, that he was "over-dosing" or that he was experiencing "anxiety" or "frustration". By contrast, Barry placed very little burden on his memory, reducing quite complex sentences to contentive words and constructing meaning from them, as example #4 suggests.

(6) T: Lāl kitāb ko Ramesh ke sir par rakhiye. [= Put the red book on Ramesh's head.]
E: *Lāl kitāb* is red book, *ko* er *sir*
T: *Ramesh ke sir par rakhiye*
E: .....(5) er, red book, er *sir* is, er, er ... *nāk* is nose, er *sir* is head, put the red book on Ramesh's head.
(Eric/Session 7)

(7) What I'm doing is trying to remember the sounds and then I'm just rehearsing the sounds to recall, then recalling it, and translating it and recalling it in English and then remembering that and then going on with the rest and then putting them together ... so I guess it's like a straight translation process.
(Eric/Session 8)

Another behaviour that was common to both these learners was the quantity of translation that was evident in their data. Neither learner made many attempts to understand the commands in Hindi. This is evident for Eric in quotes #6 and #7 above. Stern (1975) had suggested that the more successful learner attempted to think in the SL more and more. Barry and Eric did not, especially the former, even towards the end of the teaching sessions.

By contrast, Anne, Cathy and Danny were focussed less on single words but tended to deal with constituents of a sentence. They also resorted less to translation and operated more in Hindi.

(8) T: *Ab hare kalam khirḍki ke pās rakhiye.* [= Now put the green pen near the window.]
A: *kalam*, which *kalam? hare kalam?*
T: *hare* (spoken simultaneously as the previous two words)
A: *Hare kalam ko khirḍki ke pas*
T: *rakhiye.*
A: *rakhiye. Khirdki ke pās jāiye.* [= put. Go to the window. A command done previously.] *Khirdki ke pās rakhiye.* [= Put near the window. A command done previously.]
T: *rakhiye.*
A: Oh, so *ke pās* must mean towards or something like that.
Anne/Session 3)

(9) T: *Sab kitābẽ farsh par rakhiye.* [= Put all the books on the floor.]
D: *sab kitābẽ*
T: *Sab kitābẽ farsh par rakhiye.*
D: *farsh par rakhiye, sab kitābẽ?*
T: *Hā.*
D: er, *sab, sab*
T: *sab kitābẽ*
D: *sab*

T: *sab kitābẽ ... sab citrõ* ko [= all the pictures - previous context in which the word *sab* had been used]
D: oh, oh, *sab citrõ*
T: *sab kitābẽ*
D: *sab kitābẽ* (and performs the action)

Anne stated in one of her retrospective reports that she broke up a command into portions and translated them when it was more complex. The following quote from her concurrent T-A data shows her actually going through the process and then explaining in her retrospective report the reasons for going through that particular process.

(10) T: *Ab ek barā vrit aur ek choti topi us kursi ke niche khichiye.* [= Now draw a big circle and a small hat under that chair.]
A: Oh, say it again slowly. I have the words but I don't know what to do with them.
T: *Ek barā vrit* [= a big circle]
A: ok, *ek barā vrit*, one big circle, huh huh.
T: *aur ek choti topi* [and a small hat]
A: *aur ek choti topi*, and one small hat
T: *us kursi ke niche khichiye* [= draw under that chair]
A: ... ok, Draw a small circle and smallhat under the chair.
T: *barā vrit* [= big circle]
A: a big circle
T: *aur choti topi*
A: Oh, I'm sorry, a big circle and small chair, er a small hat under the chair (completes the required action) ... It was a lot of information. I couldn't do it without translating it that time and taking it apart.

(Anne/Session 8)

Similar examples are found in Cathy's data. Otherwise, both Anne and Cathy seemed to be able to make sense of the input directly, without resorting to translation, as the following quotes suggest:

(11) It's beginning to make sense, you know ... It's not just individual words, *lāl, kitāb, par, kursi, par, kursi, par rakhiye.* It means as a unit. As a sentence it is beginning to make sense.

(Anne/Session 3)

(12) ... so I just knew *lāl* was red ... and it was reversed but still it came in chunks.

(Cathy/Session 2)

A strategy that Anne and Cathy frequently used with the input was to chunk it and learn the meaning for the chunk before unpacking the chunk into its constituents. For example, the word "point" [*ungli se dikhaiye*: literally "finger with show"] was introduced early in the sessions. When *dikhaiye* [= show] was introduced in session 6, Cathy remarks

(13) Oh, I was thinking through the *ungli se dikhaiye* is, is point with the finger but it's like, and the *dikhaiye* is, has to do with you and it wasn't exactly point.
(Cathy/Session 6)

Chunking as a way of coping with language input is a behaviour that has been noticed in children learning their first language (Clark 1973; Peters 1977) or a SL (Fillmore 1979). It appears to be a strategy that seems to ease the burden on memory and allows one to attend to the message reasonably quickly (cf Bialystok and Sharwood Smith 1985). It is a pragmatic approach permitting one to better solve the immediate problem of comprehension, and is, in a sense, the reverse side of the coin suggested by Fillmore (1979) "get some expressions you understand, and start talking". Indeed, Fillmore has claimed that this is a strategy that may be central to the learning of a language, in that, "it is this step which puts the learner in a position to perform the analysis which is necessary for language learning" (p. 212). Additionally, it may be, though it has yet to be shown that these chunks, even after they have been analysed into their constituent parts, remain available to learners to use, both for reception and production, and contribute to the fluency of learners, particularly in familiar and frequently recurring contexts. Such a possibility has been alluded to by Bialystok and Sharwood Smith (1985) also. Certainly in this study, Anne and Cathy used this strategy of chunking, combined with efforts to unpack them.

One of the learners, Danny, exhibited processing behaviours quite different from the others. He did the least amount of translation and this only occurred, according to the retrospective reports, when he encountered some difficulty, as quote #9 and the following one show:

(14) ...I'm just trying to figure out what, I'm trying to break it up now because it doesn't ring a bell ...
(Danny/Session 17)

On other occasions,

(15) ... it all came together you know ... when you said something about *larke* [= boy] *cit̤r* [= picture], that was more or less automatic.
(Danny/Session 14)

Like Anne and Cathy, therefore, Danny was a "chunker" but there is no evidence in his data that he analysed any of the chunks.

In Danny's retrospective reports there were constant references to the "brain clicking", suggesting that this subject was more gestalt than analytic in his approach to the second language. In that respect he was very much like Learner C that Stevick (1982) describes, who does little conscious processing of linguistic input. Children learning

their first language have been known to exhibit a similar behaviour (Peters, 1977).

Another processing behaviour more evident in Anne than in others was her attempt to induce the grammar of the language she was learning, as shown by this example from her data.

(16) T: *Me ek sidhi rekhā̃ vrit ke bagalme khichtā̃ hũ̃.*
[= I draw a straight line beside the circle.]
sidhi rekhā̃ [= straight line; first introduction of the two words.]
A: line
T: *rekhā̃*
A: straight line ... *mera* [my] line, right? my line? *mera rekhā̃.*
T: *Na. meri*
A: Oh, spoilt my theory, ok

(Anne/Session 16)

Previously she had met a number of other adjectival phrases where the morpheme a occurred in both the noun and the adjective. In Anne's data there is evidence that she uses the input for more than simply extracting the meaning. She was an active learner looking for "relationships and patterns" (Seliger 1983) and was utilising the input for comprehension as well as creating and re-structuring her interlanguage grammar (Faerch and Kasper 1986; Sharwood Smith 1986).

There are some examples in Barry's data of focussing on form also but he tends not to dwell on it or to explore it further, as far as evidence is available. There is a qualitative difference between Anne and Barry when they do focus on form.

(17) T: *Tı̃n kitābẽ baste mẽ rakhiye.* [= Put three books into the satchel.] *Tin kitabe.*
B: ... *tı̃n.*
T: tı̃n kitābẽ
B: Oh, three books. *Kitab* [= book] sounds different with the *-ẽ* [= plural morpheme] on the end, so I don't pick it up.

(Barry/Session 8)

All students used pragmatic information in order to construct meanings. The context of teaching was restricted, hence learners were able to use it to infer or construct meanings, sometimes by process of elimination.

(18) T: How did you know? (at the first introduction of the verb 'pick up')
A: What else can you do? [that is, in the context]
(Anne/Session 1)

(19) That was part deduction ... I knew it wasn't touch and what else do you do ... I remembered what we did something like ears, nose and it wasn't touch so it must have been pull. (Barry/Session 12)

(20) I am making my judgements on what it means, er from what's logical for the situation ... (Cathy/Session 16)

(21) I figured that when you said something about the *bord ko saf kijiye* [= clean the blackborad] umm - when you said *lijiye* means 'to pick up', so *kijiye* must be 'to take off' or something ... the board. What else? (Danny/Session 4)

(22) Well, it was an elimination process. What could be *baste* [= bag] that you could put books in. It couldn't be the box, so this is what we were doing before. (Eric/Session 17)

The T-A data also showed that there was considerably more repetition of words, phrases or complete sentences on the part of some learners in order to try to learn the language. The following order begins with the learner who had the highest percentage of statements coded as 'repeating for the purpose of practice': Danny > Cathy > Anne > Eric > Barry, ranging from 14% to 3%.

This behaviour was more evident in the data of Anne, Cathy and Danny. While Bialystok (1979) and Oxford (1986) both found "functional practising" correlated with proficiency, there was no opportunity in this study for this type of practice. Practising in this study was tantamount to rehearsing and it appears that at the very early stages of SL learning, this strategy may contribute to the development of some aspects of proficiency (cf Seliger 1977).

DISCUSSION

In summary, in terms of meaning construction, the processing behaviours of some of the subjects showed a greater SL based approach to it, with resort to translation when an utterance was complex or proved difficult, for any number of reasons, to understand. This was combined with the strategy of chunking the input into meaning units and only later, when these meaning units were understood automatically, were the meanings of their constituents worked out. In terms of automatic and analysed factors suggested by Bialystok (1982), these subjects attempted to make automatic the retrieval of meaning of unanalysed chunks of language and having gained a degree of automaticity, used the spare processing capacity, or attentional resources, for analysing the chunks. By contrast, Barry achieved greater automaticity over retrieval of content words but thereby appeared to sacrifice the opportunity for analysis, particularly of syntax. Eric attempted to analyse and understand each word, thereby placing a high load on the automatic dimension, a fact borne out by the large number of statements (7476) recorded for him (cf only 4134 for Barry).

A number of explanations are possible for the differences in the processing behaviours of these five subjects. Anne, Cathy and Danny had a history of successful second language learning. During these experiences it is possible that they had developed strategies which enabled them to learn a second

language more efficiently and had used the same strategies in the learning of Hindi. This may account for their doing less translation and attempting to operate in the target language itself. Nation and McLaughlin (1986) in their study of subjects learning an artificial language found that those subjects who knew four or more languages were significantly better than bilingual and monolingual subjects in formulating rules under implicit learning conditions.

The input that the learners received was all oral. It may be that some learners may benefit more from visual input also. In one of his retrospective report Barry mentions when he has difficulties between two words that he would normally write them down and thus learn them. The implication for language teaching is clear. A particular method may not be maximally efficient for all learners.

It is also possible that if the lessons had continued and Barry and Eric's proficiency in Hindi had reached a threshold level, they could have utilized some of the strategies that the "better" learners had used. It would seem that they could not simultaneously pay attention to meaning as well as to some aspects of the form, as Stern (1975) had suggested and as Van Patten (1988) has shown. To answer the question whether learners do go through a proficiency threshold, a much longer treatment experiment would have to be set up than was the case with this one.

There were five learners in this study and there were at least four different approaches to the task of meaning construction and to learning Hindi as a second language. By the end of the teaching sessions there was some evidence that Barry and Eric would have to change their approach if they were not to become increasingly frsutrated. There may be many paths to SLL but it seems that some paths may be more slippery than others.

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