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ELICITING LEARNING STRATEGIES FROM LOWER PRIMARY SCHOOL STUDENTS IN SINGAPORE[1]

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Introduction

Language learning strategy (LLS) research has thus far focused on adult second language learners. Very few empirical studies can be found on primary, especially lower primary school children. What few studies that exist employ research techniques such as questionnaires and think-aloud protocols as studies on adults do. However, we know very little if the research methods commonly used among adult learners can be applied to lower primary school pupils (Grades 1-3), and in a bilingual language context such as Singapore where English is increasingly being used as language of the home (Singapore Department of Statistics, 2000).

Despite the difficulties associated with research design, data collection and analysis, published studies rarely show the untidy side of the research process. We believe that displaying our "dirty laundry" (Reid, 1990) in public will not only help beginning researchers see what is behind seemingly perfect published studies, but also help amass the much needed knowledge on data elicitation, especially from young learners at the lower primary school level.

This paper, therefore, has a two-fold purpose: sharing the problems we encountered in eliciting strategies from lower primary school pupils in Singapore and presenting some preliminary findings on these learners' use of language learning strategies. To this end, we will try to answer two research questions:
1. Can think-aloud be used to elicit language learning strategies from lower primary school pupils in Singapore?
2. Do lower primary school learners differ from each other in their use of language learning strategies?

Strategy identification

A strategy is a goal-driven, dynamic problem-solving process that involves at least the following procedures (Gu, 2003):
- Identifying problem
- Analysing task
- Making decisions
- Executing plan
- Monitoring progress and modifying plan
- Evaluating result

The most common methods for strategy elicitation (irrespective of subjects' age group) are retrospective self-reports such as questionnaires and interviews. These methods are intended to elicit students' recollections of what strategies are used, when, how, and how often they are used. Despite the obvious benefits of access to a large number of participants and relatively easy ways of analysis, strategy surveys and self-reports may reflect what strategies students think they use rather than what they really use. Another data collection method, classroom observation, has been shown to yield little information on students' mental activities (Cohen, 1998; Naiman, Frohlich, Stern, & Todesco, 1978; O'Malley & Chamot, 1990). A method that is receiving more and more endorsement is think-aloud procedures in which students are asked to verbalise what they are thinking while they are performing a language learning task (e.g., Chamot & El-Dinary, 1999; Gu, 1994; O'Malley, Chamot, & Kupper, 1989).

The think-aloud technique is arguably the best available means of examining what goes on in the learners' mind as they perform a given task (Cohen, 1998). However, there are many problems associated with think-aloud procedures (see Ericsson & Simon, 1993 for a detailed discussion of other related issues involved in using this technique). Table 1 tries to capture some of the most commonly mentioned problems and ways of dealing with them that strategy researchers have accumulated in the last three decades.

Table 1 Common problems with think-aloud procedures

Problem	Solution
Verbal report delays cognitive processing	• Provide pre-training • Minimise the time between process and report • Prompt respondent by using concrete examples and contextual cues
Verbal report has intrusive effect	• Create task conditions that resemble as closely as possible those without verbal report • Ask respondent to perform the way they would normally perform without verbal report
Respondents may differ in their ability to verbalise	• Give clear instructions before verbal reporting • Provide informant training – warm-up trials on similar tasks
Weaker students may find it difficult to verbalise in L2	• Give subject a choice of language • Use more proficient language for reporting
• Respondents may be too engrossed in task and forget to verbalise • Respondents may not be able to remember mental events after performance and may therefore give faulty reporting	• Tap mental event information while it is still available. Report only on information being attended to in STM • Provide reminders such as red dots • Verbalise after each sentence, each episode, at signalled spots, after every 2 minutes, or at the end of the text • Prompting without leading • Use simple reporting tasks that do not require excessive concentration or effort

Young learners' use of language learning strategies

Very few empirical studies on primary school pupils' use of language learning strategies can be found in the literature. This could well be because of the difficulties associated with working with children in eliciting strategies; it could also be because of a common preconception that children are not metacognitively developed enough to talk about their own learning process. Table 2 lists five data-based studies we have found on children's use of language learning strategies. Of these five studies, only Chesterfield and Chesterfield (1985) and Chamot and El-Dinary (1999) include lower primary pupils and younger learners. Chamot and El-Dinary is the only study that made use of the think-aloud technique in data-elicitation, together with other methods. In fact, Chamot and her colleagues at George Washington University are the only researchers who have over the years gathered systematic and extensive experience working with young learners in language learning strategy research. However, they have not reported their problems in conducting their research, even though they have encountered almost exactly the same kind of difficulties that we have met (Anna Uhl Chamot, 2002, Personal communication).

Table 2 Studies of young learners: Methodological information

Studies	Subjects	Research questions	Method
Chesterfield and Chesterfield (1985)	• Pre-school through first grade (n=14) • Mexican American kids in Texas	• The extent to which LLS are used by children of different L2 proficiencies in bilingual classrooms • The systematicity in the development of such strategies	• Longitudinal • participant observation (field notes and audio-taped samples of classroom discourse)
Sugeng (1997)	• Grades 4, 5, and 6 (n=240) • Indonesian elementary school pupils	• What are the students' learning strategies? • Do language, gender, and grade affect strategy use?	Classroom observation using a 30-item list of observable physical actions
Chamot and El-Dinary (1999)	• 3 immersion programs (French, Spanish, Japanese) • Kindergarten through grade six • Washington, DC suburbs	Which learning strategies are used by more effective and less effective learners in elementary foreign language immersion programs?	• 6-year longitudinal • Annual think-aloud interviews • Classroom observations • Questionnaires • Interviews with teachers

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Purdie and Oliver (1999)	• 9-12-year old (n=58) bilingual children • Australia	• Length of stay in Australia and strategy use • Culture group and strategy use • Beliefs, attitudes and strategy use	• Structured interview • Questionnaire
Lan and Oxford (2003)	• Grade 6 EFL learners in an elite elementary school (n=379) • Taiwan	• Overall profile of strategy use • Gender, proficiency level, and/or liking English and strategy use	Questionnaire

This study

Subjects, instruments and procedures

We tried out our data collection methods and tasks on 18 lower primary pupils. Nine of them were primary 1 pupils aged 7 years old and nine were primary 3 pupils aged 9. These pupils were from an average government-run neighbourhood primary school in Singapore. Our main elicitation method was probed think-aloud, or, more precisely, probed introspective verbal report.

We used 4 tasks to elicit strategy use. One was a listening comprehension task that used a taped fairytale; one was a reading task that was based on a passage accompanied by supporting pictures; one was a writing task that used a set of 4 pictures presented in scrambled order; and the last was also a writing task that required the pupil to select one of three topics given and write about the chosen topic. Some pupils performed all the four tasks, while others performed one, two, or three of the four tasks. The pupils were both audio- and video-taped while performing the tasks. Table 3 is a summary of the number of verbal reports elicited from the two groups of pupils performing different tasks.

Table 3 Tasks in this study

Grade	Task				Total
	Listening	Reading	Writing (picture)	Writing (topic)	
Primary 1	3	7	4	4	18
Primary 3	3	4	4	4	15
Total	6	11	8	8	33

As can be seen from the table, 18 verbal reports were elicited from the primary 1 pupils: 3 on the listening task, 7 on the reading task, and 4 on the picture-prompted

writing task and the topic-prompted writing task respectively. Fifteen verbal reports were elicited from the primary 3 pupils: 3 on the listening task, 4 on the reading task and 4 on the two writing tasks respectively. Altogether there were 33 verbal reports ranging from half an hour to slightly more than one hour. These reports have yielded a rich source of information about the pupils' use of language learning and use strategies.

Strategy elicitation in lower primary schools: Problems and solutions

Unlike adults reported in many studies that used think-aloud as a data collection method, a great majority of the pupils we worked with had much difficulty in verbalizing their mental processes while performing a language task. As a result, we had to ask questions constantly to probe for information that could reveal their mental processes and strategies. Consequently, we did not get think-aloud protocols but verbal reports elicited through intensive probing. Table 4 lists five types of problems we encountered and how we decided to solve the problems, either on the spot or in our later study.

Table 4 Strategy elicitation: Problems and solutions

Problems		Solutions
Communication between researcher and respondent	▪ Researcher language too formal ▪ Researcher accent problematic for children ▪ Researcher not able to pick up Singlish expressions ▪ Young respondents uneasy with male researchers	▪ Try to control our language use to make ourselves understood ▪ Use local research assistants ▪ Use female research assistants

Strategy elicitation	▪ Pupils not used to thinking aloud
	▪ Researcher may
	  • not know what to ask
	  • put words into kids' mouths
		▪ Use game-like procedures in training, e.g., blind-fold pupils and let them tell what they find in a box; fill in speech bubbles
		▪ Play dumb and ask respondent for help, e.g., adding deliberate errors, asking for advice
		▪ Careful training of RAs, e.g., RA manual, video tapes, on-the-spot training

Silence, voice level and body language	▪ Children's voice too faint ▪ Frequent use of body language, e.g., nods, shaking head, eye	▪ Sit slightly apart from child so that s/he has to raise his/her voice ▪ Repeat what child said and confirm intention with child ▪ Use video camera

		movement	
Covert strategies	Strategies are often not explicitly mentioned, e.g., verbal interpretation, eye movement	▪ Probing ▪ Immediate clarification with respondent ▪ Record all behaviours (video, audio, field notes) and infer strategies from behaviours	
Recording & transcribing data	▪ Noisy venue ▪ Recording unclear	▪ Use more than one tape recorder ▪ Use external microphone ▪ Use both video and audio camera	

All but "strategy elicitation" in Table 4 are technical problems that are relatively easy to deal with. The elicitation problems, especially researcher problems, are crucial in ensuring the validity of data. Because our subjects are young children, they have difficulty in understanding and responding to general probing questions. Often specific questions have to be used. However, in asking specific questions, there is a real danger of putting the researcher's strategies into the child's mouth. That is, we may suspect that the child is using one or another strategy and ask a question to check if that the strategies are actually used. For example, "are you doing A or B?" The child may not use any of the strategies but choose one in compliance with our request. Such probing is likely to misrepresent the picture and result in an overestimation of a child's strategies. On-the-spot probing requires both knowledge of the field and skills in data elicitation. The spontaneous nature of the probing needed can result in leading questions that even experienced researchers would find hard to avoid. We have since compiled a detailed research assistants' (RA) manual detailing not just the materials, the tasks, and the procedures but also why we should do it the way we require plus possible strategies we can expect from pupils in completing the tasks. Besides pre-training and the RA manual, in our major study that followed this piloting, we provided on-the-spot training in the initial week in which we observed an RA's data collection session and conducted a post-mortem analysis.

Successful vs non-successful pupils: Do strategies make a difference?

The following are some typical episodes of the verbal reports. The first two episodes are from primary 1 pupils' verbal report on the listening task; the third episode is from a primary 3 pupil's writing task. The listening task involves the pupils listening to a pre-recorded story and stopping every two or three sentences to verbalise what goes on in their minds. The writing task involves the pupils in re-arranging a set of four pictures in an order they see fit, and writing up their version of the story. Italics is used to indicate the listening text, words in parentheses provides contextual information such as physical responses. R stands for the researcher, and P stands for the pupil.

Case 1: Boy, Top group, Primary 1, Listening task

Elizabeth was a beautiful princess. She lived in a castle and had expensive princess clothes. She was going to marry a prince named Ronald.

R: Tell me what's going on?
P: She want, she had a castle and she has expensive dress. She want to marry a boy, uh, the name… (pause)

When asked what he had heard, the boy did not repeat the text verbatim. Instead, he used a reconstruction strategy. That is, he tried to retell the relevant part according to his understanding and in his own words.

R: The name is Ronald.
P: Ronald.
R: What were you thinking when you heard this?
P: Later, the dragon will come out, and eat the castle.

Here the boy used a top-down listening strategy, that is, anticipating what is to happen based on prior knowledge.

Unfortunately, a dragon smashed her castle, burned all her clothes with his fiery breath, and carried off Prince Ronald.

P: The dragon come out. She, blow all the castle, she then she take Prince Ronald to her big castle.

The boy compared his anticipation with the incoming information and modified it, changing "eat the castle" into "blow all the castle". In other words, he complemented his top-down processing strategy with a bottom-up strategy. In the process, he seemed to employ another strategy. The word "smash" seemed to be a new word to the boy because his paraphrase of the word was not correct. However, the boy seemed to make an intelligent guess about the meaning of the new word and came up with what he believed to be a synonym for "blow." Also notice that the long sentence and the presence of two pronouns in the same sentence made the boy misidentify the sex of the dragon. He seemed to employ a syntactic processing strategy which connected a noun with the nearest pronoun. Because the pronoun "her" was nearest to the noun "dragon" the boy thought the dragon was female and consequently used "she" to refer to it.

Elizabeth decided to chase the dragon and get Ronald back. She looked everywhere for something to wear, but the only thing she could find that was not burnt was a paper bag. So she put on the paper bag and followed the dragon.

R: What happened?
P: Then she want to find Prince Ronald. So she find and find, then she find paper

bag. Then she followed the trail to the dragon castle.

Once again, the boy reconstructed the text in his own words.

> R: Why did she have to find something to wear?
> P: Because she, she want to marry, or else she can't marry.

Here the boy was using his prior knowledge to help himself make sense of the action of the character.

> _She_ was easy to follow, because he left a trail of burnt forests and horses' bones.

The pronoun "she" was a slip of the tongue made by the reader. The correct pronoun should be "he". This unintended mistake made the sentence incomprehensible and caused some confusion.

> P: he go and burn the forest and find, find Ronald, and the big, big giant, the dragon.
> R: Ok. Let's listen to it again. (Plays the part again). So?
> P: She walk and burn the forest and find the, find the prince.
> R: who burned the forest?
> P: The princess.

The boy's initial understanding was wrong. However, he was monitoring his interpretation, quickly identified the inconsistency and came up with the correct interpretation.

> R: The princess burned the forest?
> P: No, the dragon.
> R: why do you think it's the dragon?
> P: The dragon is tall and big. …She also easy to find the dragon trail.

Notice that in his interpretation of the story, the boy imposed a top-down interpretation of the sentence "she was easy to follow" He reinterpreted the sentence as meaning it was easy for her to find the dragon trail.

> R: Why?
> P: Because dragon has some foot, so big footsteps.

Clearly the boy was using his world knowledge to make sense and justify his interpretation.

Case 2: Girl, Bottom group, Primary 1, Listening task

The following episode is an excerpt from the verbal report on the listening task. The pupil was a girl in primary 1 and rated by her teacher as rather weak in academic performance.

Unfortunately, a dragon smashed her castle, burned all her clothes with his fiery breath, and carried off Prince Ronald. Elizabeth decided to chase the dragon and get Ronal back.

R: Tell me what's going on.
P: The dragon smacked the castle.

Here the girl was trying to repeat word-for-word what was in her working memory, or rather echoic memory. She did not understand the word "smashed" and tried to imitate the pronunciation.

R: The dragon smashed the castle. What did the dragon do to the castle?
P: (shrugs)
R: What's to smash the castle? What did the dragon do?
P: (silence)

Clearly, the girl was trying to avoid attacking the problem that the researcher had helped her to identify.

R: Can you imagine what the dragon did to the castle?
P: Take it.
R: Take it? What's to take the castle? What did the dragon do?
P: (silence)
R: What are you thinking? Do you understand the word "smash"?
P: (shakes head).
R: No. So when you don't understand the word "smash", can you guess it out?
P: (shakes head)
R: No. What do you do? When you hear something you don't understand, what do you do? Normally when you hear a story, and you have a word you don't understand—
P: Tell the teacher.
R: You ask the teacher. Anything else?
P: (shakes head)
R: No, just ask the teacher.
P: (nods)

The girl was unwilling to make a guess of the meaning of "smash". She did make a guess when the researcher probed further. However, the guess did not make much sense. The subsequent intensive probing by the researcher did not elicit any effort to refine the

guess. In other words, she abandoned her effort to guess. She did tell the researcher her strategy for attacking unknown words, that is, to ask her teacher for help. The girl's full verbal report indicates that she had difficulty in identifying what she understood and what she did not understand. When a problem was identified, she seldom took positive actions to solve it. Occasionally, she did make an effort to solve a problem, but often abandoned her effort in the middle.

Case 3: Girl, Average group, Primary 3, Writing task

Below is another excerpt of a verbal report on the picture-prompted writing task. The pupil was a girl in primary 3 and was considered a good pupil from the average class. She was presented four pictures in scrambled order that tell the story "Princess and Frog". The girl took little time to arrange the pictures in the right order and retold the story as follows:

> *A witch turns a prince into a frog. The prince did something bad. The witch is very happy after the prince is turned into a frog. The witch punishes the prince. Then the princess kisses the frog because it is cute, and then the frog turns into the prince again. The princess is very happy.*

She then proceeded to write the following text:

> *Once upon a time, there was a witch who wanted to turn a prince into a frog because the witch hate the prince.*

> *After, the witch has turn the prince into a frog, she was very happy.*

> P: *After the p—* (pause)
> R: What are you thinking now?
> P: I don't know how to spell "princess". (speaks out the word and tries to spell it according to the pronunciation without much success. Spells the word correctly with the researcher's help)

The pupil identified a problem and used the strategy of spelling according to pronunciation in an attempt to solve the problem. Though she did not succeed, she took an active approach to solving the problem.

> *princess kissed the frog—* (a long pause. Erases the clause "After the princess kissed the frog" and writes "The frog asked the princess to kiss him.")

Until now, the pupil had largely followed her original plan, that is, the story she retold after she arranged the pictures in the right order. Now, however, she seemed to find a problem with the original plan and modified the story. We may summarize her strategy here as taking a flexible approach to the initial plan.

R: Why have you made the change?

P: Otherwise, the reader doesn't understand why the princess kiss the frog.

The girl's reply showed her awareness of reader needs, a strategy that characterizes successful writing.

R: Yes, the reader may not understand. What are you thinking now?

P: Why the frog asked the princess to kiss him. (a long pause) I don't know why the frog asked the princess to kiss him. (a long pause) or the witch told the frog if no one kiss he he will not turn back into the prince again.

The girl anticipated a problem that arose from the change she made to her writing, that is, why the frog asked the princess to kiss him. She was trying to establish a logical relationship to explain the actions of the characters. She was doing so by brainstorming various possibilities. This is clearly indicated by the word "or" in her verbalization. Obviously, the girl was concerned with the coherence of her story.

R: So this explains why the frog asked the princess to kiss him?

P: Yes.

It seems that the girl was evaluating the various answers she had come up with to the question she had posed and settled down on one of them.

The witch told the frog if none kiss he he will not turn back into the prince agin.

Discussion

Lower primary school children and think-aloud

The three excerpts should suffice to show that the elicited think-aloud procedure is a feasible data collection method to use with young children and can provide a great deal of revealing information about the strategies that children deploy when performing various language tasks. While we are aware of potential problems in the use of verbal reporting with young children, we feel encouraged by the piloting results and are convinced that verbal reporting can serve as one of our major data collection means and meet the needs of our research project.

Primary 1 vs. primary 3

Our analysis of the verbal reports suggests a number of general patterns. First, the primary 3 pupils in general were more capable of verbalizing their ideas and mental processes than the primary 1 pupils. This is clearly reflected in the length of the verbal reports. Most of the verbal reports from the primary 3 pupils were much longer than those from the primary 1 pupils. Generally speaking, the primary 3 pupils were able to describe their thinking verbally and in a fairly clear and complete manner, but most of the primary

1 pupils often responded physically, by nodding or shaking their head, to the researcher's inquiry. It can be argued that the difference reflected more complex mental processes the primary 3 pupils were able to perform and their greater consciousness of their mental processes. The difference may also have to do with the primary 3 pupils' greater verbal abilities and metalinguistic awareness.

Another pattern has to do with the range of strategies reported by the primary 3 and primary 1 pupils. In most cases, the primary 3 pupils reported a wider range of strategies than their primary 1 counterparts. Take the strategies identified in the verbal reports on the writing tasks for example, several primary 3 pupils indicated an awareness of the need to explain things clearly to their anticipated reader. By contrast, only one primary 1 pupil showed an awareness of the reader's need. All the 4 primary 3 pupils organized their picture-based stories into three paragraphs that roughly correspond to the first four components of classic story grammar, that is, orientation, complication, resolution, and direct consequence. By contrast, none of the primary 1 pupils organized their writing into paragraphs. Another example comes from the strategies used by the two groups of pupils to cope with spelling problems. The primary 1 pupils tended to use only one strategy when they came across words they did not know how to spell, that is, ask others for help. The primary 3 pupils, on the other hand, reported two other strategies in addition to asking others for help, namely, looking up the problem word in a dictionary and trying to spell it out according to its pronunciation.

High achieving vs. low achieving pupils

The third pattern that has emerged from our preliminary analysis of the verbal reports is that the academically high-achieving pupils used more strategies than the low-achieving pupils. In other words, those pupils from the top classes tended to have a larger repertoire of strategies than those from the bottom classes, and those who were considered better pupils by their teachers had a wider range of strategies than those from the same classes who were rated as relatively weak pupils. For example, one of the strong primary 1 pupils was able to use a wide range of strategies on the listening task, including relating pictures to the story, anticipating the development of the story on the basis of world knowledge, self-initiation, evaluating understanding, reconstructing the story, predicting, and monitoring. A relatively weak primary 1 pupil, on the other hand, used only a few largely bottom-up decoding strategies such as verbatim repetition and focusing on detail and negative strategies such as ignoring problems and abandoning effort to tackle an identified problem. Similarly, on the reading task, a good primary 1 pupil was able to use a variety of strategies including relating an attendant picture to the text or vice versa, guessing the meaning of a new word on the basis of contextual information, predicting what comes next, looking for logical connections, using prior knowledge to assist understanding, evaluating own understanding, questioning, reinterpreting the message when noticing inconsistencies, seeking information to confirm predictions, and making critical judgments. By contrast, a weak primary 1 girl had only a couple of strategies at her disposal. More importantly, these strategies were bottom-up decoding ones that focused on micro aspects of the text, in most cases, individual words. There was no effort to make use of contextual support, nor was there any attempt to evaluate understanding.

The last pattern we have identified was that those students who were rated as good pupils in terms of academic performance had, at their disposal, many strategies which are generally held to be successful or effective strategies, while those who were rated as poor pupils tended to use ineffective strategies. For example, most good pupils frequently anticipated and predicted the development of the reading or listening text, verified their anticipation or prediction against the incoming information, assessed their own understanding, and reinterpreted the information when necessary. Most of the poor pupils, on the other hand, tended to be preoccupied with detail, depended largely on bottom-up decoding strategies, and were often not sure whether they understood a particular part of the text or not. Similarly, on the writing tasks, many good pupils planned a large chunk of their writing in advance, reread what they wrote to establish coherence, and monitored their writing for grammar as well as spelling mistakes. By contrast, most of the poor pupils only had a vague idea of what to write before they began to write, focused their attention locally, showed little concern for logical connections, and monitored their writing only for spelling mistakes.

Summary

We believe that this study has gathered enough evidence for us to arrive at the following general conclusions:
- Think-aloud is difficult but not impossible to perform on lower primary school students. A lot of probing needs to be done which requires the researcher's skill in strategy elicitation as well as in handling young children.
- Primary school children do use different strategies in learning and using English.
- The high-achieving and the low-achieving children do seem to use different strategies.

It should be noted that these general conclusions are nothing but our tentative findings based on a small set of data. We need much more data to verify these patterns and identify new ones. This pilot study reported here gave us enough confidence to plan further, larger-scale studies.

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