発話プロトコル分析
言語学習者の認知過程を探る方法として

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最近、応用言語学の分野で、言語学習者の認知過程や学習方略を探る方法としてプロトコル分析が数多く用いられている。プロトコル分析の手法は認知心理学の分野で発展してきている。プロトコル分析は、学習者の思考を妨げることなく、学習者の発話を分析することにより、学習者の潜在的な思考過程を研究者が推測できることを可能にしている。本稿では、このプロトコル分析、特に発話プロトコル分析の利点と限界について論じている。また、この分野の研究における今後の課題についても述べている。

Think-Aloud Protocols: A Means of Observing Cognitive Processes of Language Learners

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In recent years protocol analysis has been frequently used as a means of observing language learners’ cognitive processing and learning strategies in the field of applied linguistics. The method of protocol analysis has been developed in the field of cognitive psychology. Protocol analysis allows researchers to infer learners’ underlying thought processes by analyzing their verbalizations without influencing the sequencing of thoughts. This paper discusses the benefits and limitations of protocol analysis, especially of think-aloud protocols. Suggestions for future research are also discussed.
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Introduction

Protocol analysis has been frequently used as a means of observing language learners' cognitive processing and strategies as they perform various tasks. It has been popular in the field of cognitive science and psychology because the data obtained from protocol analysis allow researchers to observe, at some levels, the cognitive processes of subjects without influencing the sequencing of thoughts (Ericsson & Simon, 1993). In recent years, it has been actively employed in the field of applied linguistic and educational research in order to investigate strategies learners use in first and second languages. The assumption that underlies protocol analysis is that researchers can infer learners' underlying thought processes by analyzing their verbalizations. However, Stratman and Hamp-Lyons (1994) point out that there has been little research conducted which investigates the potential difficulties associated with this method of data collection, particularly in reading and writing. The purpose of this paper is to discuss the benefits and limitations of protocol analysis, especially of think-aloud protocols. Suggestions for future research are also discussed.

Concurrent protocols and retrospective protocols

There are two kinds of protocol analysis, depending on whether the
researcher collects the written or verbal reports during the entire time that the task is performed or after the task has been completed. Think-aloud protocols, in which information is collected simultaneously with the production of a task, eliminate several of the criticisms made against the use of retrospective protocols, in which information is collected from the subject upon completion of a task.

A typical type of retrospective protocol analysis is recall protocol. The recall protocol is an assessment instruction in which readers are asked to read a short passage and then to write, in their native language, everything they can remember about it. According to Bernhardt (1983), the recall protocol reveals "something about the organization of stored information, about some of the retrieval strategies used by readers, and reveals the method of reconstruction which [the reader] employs to encode information in a text" (p. 31). In other words, the recall protocol provides considerable descriptive data about the way the subject has processed and stored the text in memory.

However, several researchers (Maria, 1990; Swaffer et al., 1991) criticized the absence of the objective weighting analyzing systems and the time-consuming process of analyzing the data. Another criticism that arises is that a reader may understand an idea in the text but not remember it and fail to include it in the recall protocol. The recall protocol, if given immediately after the reading task, may provide information from the reader's working or short-term memory. Although the recall protocol relies heavily upon accurate self-analysis and self-report, it does not mention the subjects' memory for and awareness of strategies used during completion of the task. The think-aloud protocol eases concerns about the subjects' abilities to report metalinguistic activities because it does not ask learners to analyze or name the processes they use, but rather just speak about whatever crosses their minds during the completion of the task. Therefore, think-aloud protocols may provide research-
ers with a more accurate picture of learners' cognitive processing in second language (L2) reading.

**Limitations of think-aloud protocols**

Think-aloud protocols are not without their own critics. While think-aloud protocols may provide information on what is attended by learners, they do not provide information on the processing strategies of learners. Thus, researchers must be very cautious in using the results of these protocols in making such interpretations. Moreover, concerns have also been raised about the ability of subjects to simultaneously attend and report information. Ericsson and Simon (1993) address this concern, claiming that information that is verbally encoded should lend itself to overt vocalization "without making additional demands on processing time or capacity" (p. 63). Stratman and Hamp-Lyons (1994) question whether performance may be affected by the simultaneous demands of the task. They are concerned not only with the completeness of the reports that may be collected but also with the potential interference that protocols may cause to the completion of the task. Russo, Johnson and Stephens (1989) state that producing verbal protocols might more or less interfere with the comprehension processes of subjects. Furthermore, Waern (1988) points out that mental operations that are automated are not likely to be part of the content of immediate awareness. For example, word recognition is performed unconsciously in most reading tasks by proficient readers. Those performed unconsciously may not be verbalized during completion of the reading task. Many other perceptual processes may not be reported in think-aloud protocols.
Procedure of think-aloud protocols

Subjects each sit at a language laboratory booth with a blank cassette tape in a tape recorder. Then they receive a passage with directions written in Japanese as follows:

This is not a test. Please relax and concentrate on what you are doing. This is a kind of experiment in order to improve your reading skills. In this experiment I am interested in what you think about when you read in English. In order to find out, I am going to ask you to think aloud as you read. What I mean by "think aloud" is that I want you to tell everything you are thinking, from the time you start reading the sample text I will be giving you, until you complete the reading task. I would like you to talk constantly from the time you start the sample until you finish reading. I don't want you to try to plan out what you say or try to explain to me what you are saying. Just act as if you are alone in the room speaking to yourself. What's most important is that you keep talking, and talk clearly and loudly enough to be heard. If you are silent for any period of time, I will remind you to talk by saying "What are you thinking?" Similarly, if you begin to speak softly, I may ask you to speak a little more loudly. I will not be able to help you in any way—and you will be audiotaped while you work on the task. Do you understand what I want you to do? (adapted from Jourdenais et al., 1995)

They are told to think aloud during their reading either in Japanese or combination of Japanese and English. After reading the directions, they listen to a sample tape of a think-aloud task. It is important to explain to them that the purpose of listening to the sample tape is not to imitate it but to demonstrate what a think-aloud task would be like. Then they practice thinking aloud while reading a short paragraph for five minutes. When they start reading a sample reading passage, they also start the tape recorder and never stop it until they finish the think-aloud task.
These recorded verbalizations are transcribed and encoded for later analysis.

**Benefits of think-aloud protocols**

Think-aloud protocols have advantages of giving a more direct view of how readers process a text as they indicate what they are thinking at the moment they are reading it. Block (1986) suggests that think-aloud protocols can be an important tool for learners to recognize their own comprehension problems. Waern (1988) points out that think-aloud comments highlight thought processes during reading and provide information about how the process is monitored. For example, think-aloud comments indicate how readers use their reading strategies, such as the use of prior knowledge, metacognitive evaluation, monitoring of the processing, and construction of meaning. Afflerbach and Johnston (1986) suggest that think-aloud protocols involve verbal expression of the normally covert mental processes readers engage in when constructing meaning from a text. Baumann, Seifert-Kessell and Jones (1992) discuss the effectiveness of think-aloud protocols as a means to enhance learners’ comprehension monitoring abilities. Baker and Brown (1984) define comprehension monitoring as a dimension of metacognition which involves a learner’s use of self-regulation in receptive language processing (listening and reading).

**Conclusion**

Ultimately, the analysis of think-aloud protocols allows researchers to
explore previously inaccessible domains of cognitive processing in L2 reading. Think-aloud protocols may provide language learners with a means for monitoring their reading processes. The activities of think-aloud protocols can be used as a diagnostic tool for language learners to be able to observe and aware of their own metacognitive aspects of L2 reading. Moreover, for the pedagogical purpose, the experience of analyzing students’ think-aloud protocols gives an opportunity for language teachers to become more sensitized to various comprehension problems that students encounter and offers clues to understand potential weakness that the students may have in their L2 reading.

Although there are some limitations of protocol analysis as a method, think-aloud protocols offer potentially valuable source of information about L2 reading to researchers. In the future, further research will be needed in order to investigate the validity and the reliability of think-aloud protocols in L2 reading research.

References


