KHUYẾN KHÍCH HỒI TƯỞNG – KỸ THUẬT THU THẬP DỮ LIỆU HỮU DỤNG KHI THỰC HIỆN CÁC NGHIÊN CỨU VỀ QUÁ TRÌNH TƯ DUY TRONG KHẢO THÍ NGÔN NGỮ

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Phỏng vấn sử dụng khuyến khích hồi tưởng (stimulated recall) và hội thoại ngầm (think aloud) là hai công cụ hữu hiệu chính đã và đang được các nhà nghiên cứu sử dụng để tìm hiểu những gì đang diễn ra trong đầu mỗi người khi họ thực hiện những hoạt động cụ thể. Trong khi nói ra suy nghĩ là cách phỏng vấn để người được phỏng vấn chia sẻ họ đang tư duy như thế nào khi đang thực hiện một hoạt động cụ thể, khuyến khích hồi tưởng cho người được phỏng vấn nghe hoặc xem lại những gì họ đã làm để giúp họ hồi tưởng và chia sẻ họ đã nghĩ gì vào thời điểm cụ thể đó. Trong khảo thí ngôn ngữ, với việc phỏng vấn sử dụng khuyến khích hồi tưởng, người nghiên cứu có thể tìm hiểu suy nghĩ của thí sinh và nguyên nhân ẩn sau những hoạt động cụ thể của thí sinh trong phòng thi. Bài báo này mô tả cụ thể cách thức triển khai phỏng vấn bằng khuyến khích hồi tưởng để thu thập dữ liệu thực hiện nghiên cứu liên quan đến lĩnh vực tri nhận trong khảo thí ngôn ngữ.

Từ khóa: *khuyến khích hồi tưởng, quá trình tư duy, khảo thí ngôn ngữ.*

Think-aloud and stimulated-recall interview protocols are the two main tools that have been applied by researchers in attempts to investigate what goes on inside people's heads in certain situations. While the former interviews participants about what is inside their heads while they are performing a certain act, the later involves playing to them audio or audio-visual recordings of their own behavior to help them recall and share what was on their minds in that situation. In language testing, with stimulated-recall interview protocol, ethnographers may have insights into test-takers' inner thinking and rationales underlying their reactions in the test contexts. This article describes how to conduct stimulated-recall interviews to collect data for cognitive studies in language testing.

Keywords: *stimulated-recall interview, cognitive, language testing.*

STIMULATED RECALL - A PRACTICAL DATA COLLECTION TECHNIQUE FOR COGNITIVE STUDIES IN LANGUAGE TESTING

Introduction

How can we gain access to what test-takers are thinking in the test contexts? This question has always fascinated me while observing test-takers taking tests and the two techniques that I think of are think aloud and stimulated recall. Think-aloud and stimulated-recall interview protocols are the two main processes that have been applied by researchers in

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attempts to investigate what goes on inside people's heads while they are performing in certain situations. Whilst think aloud interviews participants about what is inside their heads while they are performing certain acts, stimulated recall involves interviewing people while playing to them audio or audio-visual recordings of their own behavior in certain situations. Taken the context of testing when researchers could not interfere the test-takers in the test context, stimulated recall proves to be a practical solution to access test-takers' thinking after the test. In language testing, with stimulated-recall interview protocol, ethnographers are able to have insights into test-takers' motivations and rationales underlying their reactions in the test contexts. In this paper, the concept of stimulate recall, cognitive science in language testing, stimulated-recall interview protocol for cognitive studies in language testing, and the process of conducting stimulated-recall interviews are discussed in details based on reviewing studies in which stimulated recall was applied as a research method and studies about stimulated recall. Limitations of applying the technique are also mentioned in the study.

The concept of stimulated recall

In 1953, Benjamin Bloom at the University of Chicago described a method that he named "stimulated recall" (Bloom, 1953, p. 161). Bloom and his colleagues audio-taped lectures at the university and then used them to stimulate students in the class to recall activities, gestures, and points made as part of the lectures. He found "as high as 95 per cent accurate recall of such overt, checkable events within two days" and described this procedure as "a method of reviving memories" (Bloom, 1953, p. 162) and students' thoughts during lectures. Since these initial studies by Bloom, stimulated recall has been used as a method for accessing cognition in a number of different activities including counseling, problem-solving, medical consultations, teaching, and researching. Many researchers used stimulated recall as their primary data source for information (Marland, 1984).

Grass and Mackey studied the use of stimulated recall methodology in second language acquisition (Grass & Mackey, 2000). Stimulated recall is an introspective method in which participants are prompted (via some visual or oral stimulus such as a video/audio-taped event, or any other tangible reminder such as different drafts of a composition, etc.) to recall thoughts they entertained while carrying out certain tasks or participating in certain events. The method is superior to a simple ordinary interview in that the participant does not need to heavily rely on memory without any prompts. Moreover, it has an advantage over thinking-aloud protocol because the participant does not need to go through a process of training in order to be able to perform a task and talk about it simultaneously.

Cognitive studies in language testing

Initial ideas of cognitive science were mentioned thousand years ago in the times of Plato and Aristotle; however only in the Twenty Century was the term "cognitive science" coined and marked with the publications of Goerge Miller's (1956) "The magical number seven, plus or minus two", Chomsky's (1956) "Three modals of language", Burner, Goodnow, and Austin's (1956) "A study of thinking", and Newell and Simon's (1956) "Logic theorist", "The first theorem-proving program" (Mislevy, 2006, p. 257). According to Friedenberg and Silverman (2011), cognitive science is "the interdisciplinary study of the mind" and its processes. It examines the nature and the functions of cognition. Cognitive scientists study intelligence and behavior, with a focus on how nervous systems represent, process, and transform information. Mental faculties of concern to cognitive scientists include language, perception, memory, attention, reasoning, and emotion (Friedenberg & Silverman, 2011). The fundamental concept of cognitive science is that "thinking can best be understood in terms of representational structures in the mind and computational procedures that operate on those structures" (Thagard, 1996, p. 17). The term "cognitive" in "cognitive science" is used for "any kind of mental operation or structure that can be studied in precise terms" (Lakoff & Johnson, 1999, p. 11).

In language testing, cognitive science was first studied in the 1990s with the development of the structures of validity arguments and in the Twenty First Century with the publications of Weir in 2005. Weir (2005) is concerned of the traditional approach in investigating construct validity of applying statistical methods such as factor analysis in order to establish the nature of construct of a test. Weir raises the issue of whether the data derived might to some extent be compromised by the form and content of the test and by the assumptions underlying its design (Weir, 2005) and coins the term "theory-based validity" and later "cognitive validity" to name a new approach in test validation, which takes into consideration the nature of the construct tested from empirical evidence of initial stages of test development. The goal of the approach is to establish whether the tasks proposed by a test designer elicit mental processes resembling those which a language user would actually employ when undertaking similar tasks in the world beyond the test.

Stimulated-recall interview protocol for cognitive studies in language testing

The ultimate goal of cognitive studies in language testing is to investigate into whether the mental processes that the test-takers employ in the test context resembles what they conduct in real world situations. In order that the researchers can have insights into what is underlying the test-takers' reactions in the test conditions, they study the input, the task types, the test context, the test scores etc. (Field, 2013). However, one of the most

popular and practical research technique for such purpose is stimulated recall. Stimulated recall is applicable for cognitive studies in general and specifically in cognitive studies in language testing in particular for a number of reasons.

Firstly, stimulated recall provides participants with supports to recollect memory. In a typical retrospective interview, researchers tend to ask participants to remember the actions that they have taken and the values or strategies that they use in general when dealing with particular kinds of social situations. Stimulated recall further develops the quality of ethnographic interviewing by providing a sort of memory prosthesis that can help the participants to better recite the acts they performed in certain situations. The researcher and the participants can discuss the actions in which the participants are actually involved. Recordings in audio or audio-visual forms of the happening can help the participants to remember what went on even in the case they almost forget what they did in those particular contexts.

Secondly, in a retrospective interview using stimulated recall, the sociologist can show the participants their own reactions. They are therefore in a position to remember their exact response and retrace their thought processes as they unfolded in real time. With prompts which are actually their own voice or images, the participants can better tell their thought as compared to traditional participant-observer ethnographies. Plenty of insight is available from asking participants questions retrospectively when the researcher and participants for example view a video of these interactions rather than merely responding retrospectively to the ethnographer's questions.

Thirdly, stimulated recall helps sociologists to better understand intra-subjective processes that allow participants to think critically about their behavior, with which richer understanding of how people guide their interactions in various situations. To compare stimulated recall interview to other techniques for qualitative inquiry like traditional participant-observer ethnographies, plenty of insight is available from asking participants questions retrospectively, and even better with support of aids such as audio or audio-visual recordings to help participants recall what actually happened.

In recent years certain researchers have applied autoethnography to attain insights similar to those potentiated in stimulated-recall interview. As a corrective, stimulated-recall interview aims to help the ethnographer produce analytic accounts of social phenomena that accumulate a diversity of opinions and strategies from members of whatever group is being studied. Foremost, stimulated-recall interview can provide the ethnographer with details about the techniques people apply to successfully engage in a particular kind of activity.

Although Green (1998) points out that a concurrent (simultaneous) report may provide more accurate data, the reason for using stimulated recall is that the nature of speaking cannot allow speakers to verbalize their on-going mental processes while they are engaged in tasks (Green, 1998). In language testing, the procedure for stimulated recall was to videotape or audiotape participants' test-taking processes, and these tapes are later played as stimuli for participants to recall what they were thinking about while engaged in the tasks in the test situations.

Additionally, stimulated recall interviewers use audio or audio-visual recordings as prompts for participants to recall memory. There are a number of advantages when using audio or audio-visual recordings for such purpose. One advantage is the density of data that audio or audio-visual recordings provide (Grimshaw, 1982). In an ethnographic approach to research, we seek to study real people in real situations, doing real activities. Recorded data can provide us with more contextual data than can pure observation data (Houck & Gass, 2011) (Iino, 1999). They can give us a more complete sense of who the people are and acquaint us with the setting in which the people function and the types of activities they engage in from day-to-day as well as the nature of these activities themselves. In language studies, this kind of audio/visual information can help us to disambiguate verbal messages by narrowing down the possible number of accurate interpretations (Iino, 1999). The audio/visual information also provides information on directionality and intensity of attention, which can be particularly useful in determining the levels of comfort and involvement of the interlocutors (Houck & Gass, 2011). These kinds of visual contextual information, then, can enrich our data base in many ways. Audio/visual recordings also provide us with denser linguistic information than does field note taking, for ideally it allows us to record every word. When taking field notes, the researcher is limited to writing down the gist of what the interlocutors said, or recording only brief interactions consisting of a few short turns because of constraints on memory and the inherently slower speed of writing as compared with speaking (Beebe & Takahashi, 1989). Another advantage of audio/visual recording is permanence (Grimshaw, 1982), which allows us to experience an event repeatedly by playing it back. With each repeated hearing/viewing, we can change our focus somewhat and notice things we had not observed at the time of taping or on previous observation (Erickson, 1982, 1992) (Fetterman, 1998). Replaying the event also allows us more time to contemplate, deliberate, and ponder the data before drawing conclusions, and hence serves to ward off premature interpretation of the data. Even a rare event, when captured on tape, can be

replayed repeatedly for a thorough analysis so that it can still be studied intensively. Real time observation does not have this advantage (Erickson, 1992).

The process of conducting stimulated-recall interviews

The stimulated-recall interview protocol procedure adapted based on the procedures introduced by O'Brien and Dempsey (O'Brien, 1993) (Dempsey, 2010), in general, includes the following steps:

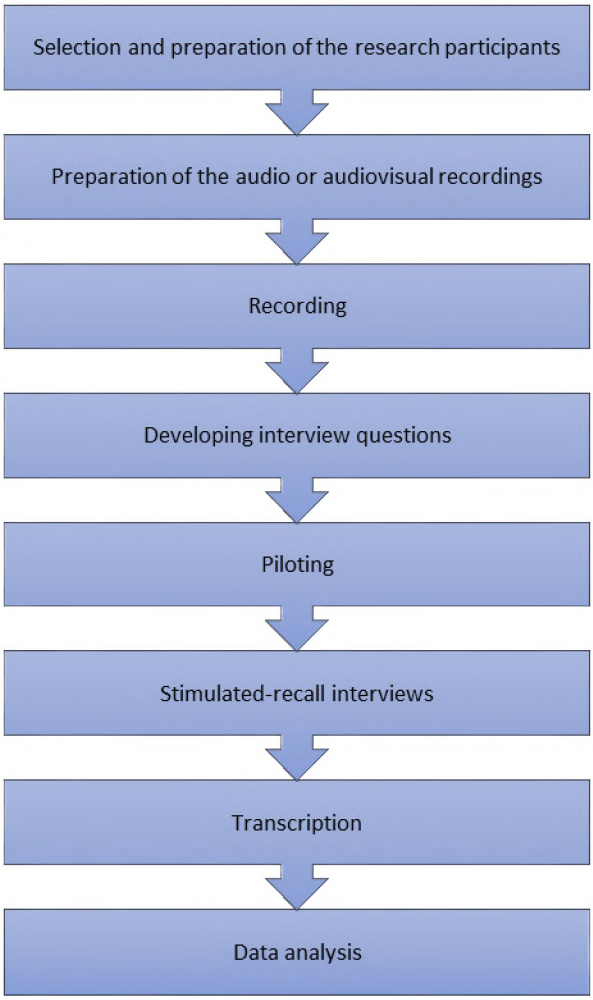

Figure 1: Stimulated-recall interview protocol stages
adapted from O'Brien's (1993) and Dempsey's (2010)

Step 1: Selection and preparation of the research participants

In general, it is critical that participants are selected carefully or randomly, researchers should consider the genders, the ages, occupations, etc. of the participants. The participants selected should have the ability to articulate their thoughts; are able to express their ideas with clarity; are willing to be frank about their thinking; are prepared to spend time being interviewed. The researchers should

ensure, as far as possible, that the selected research participants are representatives of the target audience of the studies. A cross-section of such variables as academic achievement, ability, motivational level and gender, and occupations could be used as a guide in selecting which test-takers could be the research participants, but this will be mostly determined by the aims of the studies.

Step 2: Preparation of the audio or audiovisual recordings

Most of the test administration procedures requires the test-takers being audio or audiovisual-taped or both. For setting without such requirement, it is important that the researcher should get consent from the test-takers and examiners to record the test sessions in progress. Once being accepted the researcher should prepare recorders of good quality as well as select where to locate the devices to make sure of the sound and image quality.

Step 3: Recording

In general, the participants being recorded will be aware of that recording. When recording, researchers seek to create as full a document as possible of the test session being studied. Researchers should also seek to ensure that the participants are not "performing" for the camera, introducing a social-desirability bias into our research even before the test-takers answer questions in the stimulated-recall interviews. The recordings of people should cover the whole-time length of the test sessions being the subjects of the studies. This camera should capture a good range of activities. But the ethnographers should also decide the appropriate length of recordings based on their experience and the aim of the research.

While recording the activities, researchers should make notes of incidents that s/he would like to explore with the participants. Shortly after recording the activities, the ethnographer should view or listen to the recordings, making notes of the times at which ethnographically interesting moments occurred and crafting specific questions to ask during stimulated recall interview (see Appendix 1 for more details).

Step 4: Developing interview questionnaires

When developing questions about processes in the test sessions being studied, it is crucial that the ethnographer considers carefully all the required inputs. The questionnaires should be developed so as that they can help collect sufficient information and can help recall the memory of the participants.

Step 5: Piloting

The questionnaires and the stimulated-recall interview should be piloted. The pilot will help the ethnographer to refine the questionnaires and the stimulated-recall interview procedure. It should be noted that the piloting should be conducted with typical participants as

representatives of the targeted audience of the research.

While Dornyei points out that participants should be trained concerning how to recall, as thinking aloud is not a natural process (Dörnyei, 2007), Gass and Mackey argue that extensive training sessions may have an influence on the data produced; thus, simple instructions should be given (S. M. Gass & Mackey, 2000). According to Swain et al (2009), previous tasks completion and previous stimulated recall sessions may affect the next performance and the next stimulated recalls; thus, the main study needs careful consideration regarding sequences of performance and recall sessions between tasks in testing and between the testing condition and classroom condition. All the issues mentioned above were facilitated by undertaking a careful pilot study.

Step 6: The stimulated-recall interview

One of the major threats to the validity of this type of data is in the stimulated-recall interview procedure. It is critical that the interviewer is aware of how to conduct stimulated-recall interviews and is able to conduct the interviews soon after the recording. Kagan outlines a list of procedures for Interpersonal Process Recall for counselling and these procedures provide a useful basis for stimulated-recall research (Kagan, 1967) (Marland, 1984) (see Appendix 2).

The following issues were considered in order to ensure collection of the highest quality data using stimulated recall methods (S. M. Gass & Mackey, 2000) (S. Gass, Mackey, & Ross-Feldman, 2005):

(1) The interval between the task and the recall session should be as short as possible, as memories can be hindered by the time delay. The interview itself should be conducted as soon after the recording as practicable, to ensure the greatest memory of the activities by participants as possible.

(2) Participants should be encouraged to recall what they were thinking about during the performance rather than to provide explanations or interpretations. While questions from the interview protocol should form the bulk of the interview, it is worthwhile to give the informant a good deal of freedom to discuss moments he or she finds significant. Doing so may present the ethnographer with a view of the research site that she had not previously obtained, as a participant may be interested in an interaction that the ethnographer had not himself found particularly notable.

(3) Participants should use their mother tongue in recall sessions. With mother tongue, the participants find it easier and natural to express what is inside their mind.

Step 7: Transcription

If an analysis of the interviews is planned, typed transcripts of each interview will be required. In order that the transcription is to be conducted to reflect all the details of the interview including patterns like the voice or the

intonation and stress of the utterance, a transcription convention system should be applied. Different systems of transcription conventions have been applied such as those introduced by Markee (2000), Hinkel (1999), Hutchby and Wooffitt (1998), Atkinson and Heritage (1984) (see Appendix 3 for an example of transcription coding system, which was abridged and adapted from Atkinson and Heritage's transcription conventions (Atkinson & Heritage, 1984)). After transcription, the research participants should be given the option of removing any statements made by them before the researcher uses the transcriptions for analysis.

Step 8: Analysis of the data

Although there are a number of ways to analyze audio or audio-visual recordings of social activities, ethno-methodology offers a unique form of qualitative analysis. The method is not just to code events and then search for statistical patterns, but rather to search for patterns in the temporal unfolding of events in order to discover their internal, and often sequential structures. With different cases, the objective of qualitative analysis is to provide an "in-depth analysis of a particular phenomenon that facilitates a deep understanding of how the phenomenon under study works". Analyses based of data collected with audio or audio-visual recordings of social activities enable the analyst to use "whether the practices to which participants are thought to orient are robust to account for a broad range of data gathered in different conversational contexts" (Markee, 2000, p. 60).

In language testing, in order to facilitate analysis of audio-visual data, detailed transcriptions are made of any talk involved in the event. Transcripts are crafted so as to represent the temporal structure of events and many details of actions being taped. They also sometimes contain descriptions of body movement and the manipulation of tools. The researcher should use the transcripts and the ideas gathered from stimulated recalls in analyzing the inner thinking of the test-takers. A comparison shall be made later on between the strategies and the cognitive patterns being processed by the test-takers in the test conditions to those they probably apply in non-test conditions.

Limitations of applying stimulated-recall interview protocol

According to Dempsey (2010), there are, however, limitations to this technique of which the ethnographers should be aware. It is often difficult to express thoughts in words (Feld, 1984) (Monson, 2009). Researchers should know that it is similarly difficult for people to talk about a variety of interactions by using words. Another limitation is that this is a time-consuming method for researchers and their participants alike. Participants must commit not only to an interview, but also to having their activities recorded. Logistical issues of scheduling interviews soon after recordings may present a

significant obstacle to the investigator. Further, if a sociologist wishes to investigate any sort of illicit or socially stigmatized behavior, s/he may find participants unwilling to have their behavior recorded. This could be a problem when researching any number of kinds of behaviors or interactions that might fruitfully be investigated using stimulated-recall interview when trying to understand the intricacies of activities (Dempsey, 2010).

In the Vietnamese contexts, besides those above-mentioned limitations, researchers should notice possible situations that may incur. First, they may find it difficult to have recordings of good quality because surrounding noise may affect the participants' voice. Second, it is relatively costly to do recording in Vietnam where recording devices are still rather expensive to afford. Then in testing conditions, the test providers may be reluctant to allow researchers to access the test data required for conducting linguistic studies in general and cognitive studies in particular.

Conclusion

Ethnographers find that stimulated-recall interview protocol gives them a useful tool to help in their investigations of a wide range of activities (S. M. Gass & Mackey, 2016). In language testing, the ethnographers could produce audio and/or video recordings of the test sessions, and interview participants while reviewing those recordings. Doing so can help them to understand what signals test-takers understand as important, what signals they think are not important, and how they choose from various options to act upon the information they receive in the situations. Stimulated recall sessions can aid researchers in answering fundamental questions about test-takers' thinking. While it does require extra commitment on the part of participants to be confronted by their own words and actions, it is clear that ethnographers can learn important lessons by using stimulated-recall interviews. As audiovisual recording equipment becomes ever more affordable and accessible, researchers interested in studying the cognitive aspect of language testing could find the benefits of stimulated-recall interview protocol regardless of the costs the technique may incur.

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Appendix 1: Checklist when conducting audio or audiovisual recording

When audio/visual recording on site, the followings should be noticed:

-Check possible recording locations for light, sound, and context

-Set up cameras, recorders, and microphones

-Check sound and light/exposure with cameras, recorders

-Before starting the formal recording, piloting the recording on site; Watch for too dark pictures that might look good in camera view but not on computers; Monitor for too low audio levels by constantly listening with headphones when piloting

-During recording, avoid zooming in and out and panning of all types; avoid relocate the recording devices; and avoid electricity interruption

Appendix 2: Guidelines when conducting stimulated-recall interviews

The following guidelines are developed based on the procedures suggested by Marland and Edwards (1986), Marland (1984) and Spradley (1979):

-Before the first interview, check once again that the participant understands the purpose of the research study

-Create a relaxed setting for the interview in a closed or separate room.

-Interview each participant separately, one on one.

-Encourage the participant to press the video recorder pause button and self-report their thinking as much as possible. The ethnographer could encourage them to say whatever is on their mind, to not hold back any hunches, to speak as continuously as possible, to speak audibly, to not worry about speaking in complete sentences, to not over explain or justify what they have said, to control the interview as much as possible, and to elaborate as much as they like.

-Actively listen to the research participant and respect what s/he says.

-Respond to the participant's self-report with encouragement and invitation for further disclosure.

-Whenever necessary request further clarification or confirmation.

-Avoid leading questions, making evaluative comments or being critical (e.g. "You smiled there, did you now understand how to calculate the density?"). Also, avoid leading the interview by the inappropriate use of non-verbal behavior.

-Initiate the participant's self-report if and where necessary by asking such questions as: "What were you thinking just then?" or "What are you saying there?"

-Audio tape all stimulated-recall interviews.

Appendix 3: An example of transcription coding system

TRANSCRIPTION CONVENTIONS

Adapted from Atkinson and Heritage (1984)

[	Indicates the points of overlap onset
]	Indicates the point of overlap termination
=	a) turn continues bellow, at the next identical symbol b) if inserted at the end of one speaker's turn and at the beginning of the next speaker's turn, it indicates that there is no gap at all between the two turns

(2)	An interval between utterances (two seconds in this case)
-	A single dash indicates an abrupt cut-off
CAPITALS	Especially loud sounds relative to surrounding talk
Ah:::	Indicates lengthening the preceding sound
○ ○	Utterances between degree signs are noticeably quieter than surrounding talk
I …	"…" indicates uncompleted utterance
↑ ↓	Indicate marked shifts into higher or lower pitch in the utterance following the arrow
sound	Indicates utterances of higher tempo than surrounding talk
sound	Indicates utterances of lower tempo than surrounding talk
☺	Smiley voice
X___G1	The gaze of the speaker is marked above an utterance and that of the addressee below it. An unbroken line (___) indicates that the party marked is gazing towards the other (girl 1 in this case); absence indicates lack of gaze. Dots (. . .) mark the transition from nongaze to gaze and the point where the gaze reaches the other is marked by X. Commas (, , ,) indicates the moment when gaze is shifted.
((nodding))	Non-verbal actions or editor's comments
(hhh)	Laughter tokens
(unintelligible)	Indicates a stretch of talk that is unintelligible to the analyst
(comment)	Single parentheses indicate unclear or probable item