CHAPTER THREE

METHODOLOGY

This chapter comprises six sections. The first section gives an overview of the research design of this study. Then the second section introduces the subjects. The third section describes the video materials used in this study. The fourth section discusses the procedure of training session and data collecting session. The fifth section presents a data analysis plan. Finally, the sixth section discusses the triangulation procedure.

3.1 Research design

The research design of this study is shown in Figure 3.1. This study incorporates the use of think aloud protocols and semi-structured interview to investigate the cognitive processes of Malaysian learners who are learning Japanese as a foreign language.

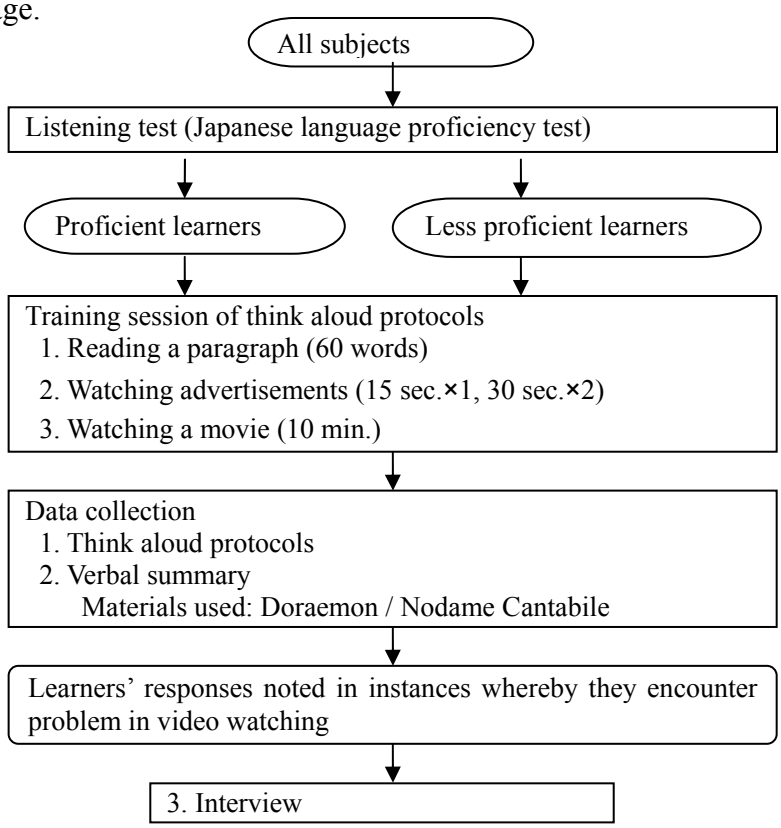

Figure 3.1
Research design

All the subjects took the Japanese Language Proficiency Test (Level 1) and were divided into two groups: proficient learners (PLs) and less proficient learners (LPLs). Then the researcher met with each subject and conducted a training session of think aloud with three types of activities, which consist of reading a paragraph, watching advertisements and watching clips of a movie. After the training session, the actual data collection was held. The actual data collection session consisted of three phases of data collection, i.e., think aloud protocols, verbal summary and interview. The procedure of the data collection will be explained in section 3.4. The next section will describe the subjects of this study.

3.2 Description of the Subjects

The subjects of this study were eight Japanese as a foreign language (JFL) learners in Kuala Lumpur. The sampling method of this study adopts the convenience sampling approach.

These subjects were divided into two groups: proficient learners (PLs) and less proficient learners (LPLs). PLs were teachers of Japanese language and staff of two Japanese companies in Kuala Lumpur. They were all proficient users of Japanese language and have opportunities to use the language regularly in their schools or offices. However, due to the variety of their target audiences, some of these teachers get more opportunities to teach language of higher complexity than the others, while the LPLs were JFL learners attending Japanese language classes in Kuala Lumpur.

The researcher conducted a listening test on each learner in the PL and LPL groups to reconfirm the differences of listening proficiency level between PLs and LPLs. For this purpose the researcher used the listening component of the Japanese Language Proficiency Test (Level 1). The Japanese Language Proficiency Test is a standardized test organized by The Japan Foundation and held once a year worldwide. This test has

four levels, from Level 1 to Level 4. Level 1 is the highest level and Level 4 is the lowest level. The 1996 test (Level 1) was used in this study to differentiate the listening proficiency of the PLs group and the LPLs group. Before conducting this test, the researcher asked the subjects and confirmed through their response that none of them had taken the 1996 JLPT test (Level 1).

Table 3.1
Subjects of this study

	Background	Score of listening test	age
PL1	A Japanese language teacher	81%	41
PL2	A Japanese language teacher	85%	43
PL3	An employee of a Japanese company	65%	32
PL4	An employee of a Japanese company	69%	29
LPL1	Japanese language learner	42%	27
LPL2	Japanese language learner	50%	28
LPL3	Japanese language learner	42%	25
LPL4	Japanese language learner	54%	25

3.3 Materials

Two types of audio/visual material were chosen to investigate learners' cognitive processes. One of which was a Japanese animation 'Doraemon (Nobita and dinosaur)' based on a comic for children and the other was a Japanese drama 'Nodame Cantabile' based on a comic for adults. These two materials were chosen because they were perceived as possessing different kinds of linguistic features and requiring different kinds of strategies and/or background knowledge for the subjects to understand the content. Subtitles had been removed while the subjects were watching the videos.

Two scenes from 'Doraemon' and two scenes from 'Nodame Cantabile' were chosen for this study. The first scene of 'Doraemon' was about 4 minutes long and the second scene lasted about 5 minutes. The first scene of 'Nodame Cantabile' was about 3 minutes long and second scene lasted about 5 minutes. The total watching time of each

video was about 8 minutes. These scenes were chosen because they were considered to have different types of discourse for the subjects to understand the videos, such as types of conversation (monologue, dialogue, argument, persuasion) and types of visual clues (places where the characters speak, images that the characters have in their minds).

The researcher followed the process below when choosing the scenes for this study from these videos. The researcher transcribed three scenes from "Doraemon" and four scenes from "Nodame cantabile". The length of each scene was around 2.5 to 5.5 minutes. And then the researcher checked the difficulty of vocabulary in these texts by using the website 'Reading Tutor Homepage' (http://language.tiu.ac.jp/tools_e.html). This website provides learners and teachers of Japanese language an online dictionary that is capable of making a word list from a given text. And it also provides an online level checker of vocabulary and *kanji* (Chinese characters), which informs the difficulty of a given text. In this study the researcher used the vocabulary level checker found on this website.

Level 4 includes the basic 800 words

Level 3 includes 1500 words

Level 2 includes 6000 words

Level 1 includes 10000 words

When given a written text, the vocabulary checker gauges the difficulty of vocabulary in the text based on the vocabulary description of Japanese Language Proficiency Test (JLPT). JLPT has 4 levels, i.e., from Level 1 to Level 4. Level 4 is for the elementary level learners who have studied Japanese for about 100 hours. Level 3 and level 2 are for learners who have studied for 300 hours and 600 hours respectively. Level 1 is for the advanced level learners who have studied Japanese for about 900 hours. The 'Reading Tutor Homepage' also shows the result with 5 star index: 1 star (*) means easy, 2 stars (**) less easy, 3 stars (***) normal, 4 stars (****) less difficult, and 5 stars

(*****) difficult.

The researcher conducted a pilot study on one proficient learner, who was not included in the actual data collection of this study. The purpose of this pilot study was to find out which scenes were difficult enough for the proficient learner to use various strategies that were necessary to overcome difficulties she encountered while watching the videos.

First, the researcher asked the subject to pause the video by herself when some thought came up in her mind and to speak out during the pause what she had thought while watching the video. But after some trial, the subject and researcher found that it was difficult for the subject to pause the video when she was watching it. She reported that it was difficult for her to pause the video by herself because she had to concentrate on understanding its content. So the researcher changed pausing of the videos. The researcher paused the video at predetermined points for her and asked her to verbalize her thinking process. After she has finished verbalizing thinking process, the researcher resumed playing the video again. As a result, the subject could concentrate on watching the video as well as verbalizing her thinking process.

Second, the researcher also found that the subject sometimes spoke out only the storyline of the video but did not speak out what lead her to the understanding of the video. In lieu of that, the researcher prepared questions to collect the information about the subject's thinking processes (Appendix D).

After checking the difficulty of vocabulary and conducting the pilot study, the researcher chose two scenes from 'Doraemon'- one was 3 stars (normal) and the other was 4 stars (a little difficult), and two scenes from 'Nodame Cantabile'- one was 3 stars and the other was 4 stars.

Table 3.2
Vocabulary in the 1st scene of 'Doraemon'(D1)

Vocabulary level *** (normal)						
	level 4	level 3	level 2	level 1	Others	Total
Frequency of a word used in a scene	268	49	52	14	41	424
	63.2%	11.6%	12.3%	3.3%	9.7%	100.0%
Frequency of words in the same level used in a scene	91	37	40	10	30	208
	43.8%	17.8%	19.2%	4.8%	4.8%	100.0%

With reference to Table 3.2, Level 4 contains the basic 800 words approximately. Level 3 contains the next 700 words, which makes the total number of vocabulary about 1500. Level 2 contains the next 4500 words, which makes the total about 6000. Level 1 contains the next 4000 words, which makes the total number about 10000. The category of *Others* contains more difficult words which are not contained in the four levels, i.e., from level 4 to level 1. In each level of the table there are two numbers and two percentages. The numbers and percentages above show the results when the same word appeared several times and they were counted as different words. On the other hand, the numbers and percentages below show the results when the same word that appeared several times were counted as the same word. Tables 3.2, 3.3 and 3.4 below show the results of vocabulary check of each scene by the 'Reading Tutor Homepage'.

Table 3.3
Vocabulary in the 2nd scene of 'Doraemon' (D2)

Vocabulary level **** (a little difficult)						
	level 4	level 3	level 2	level 1	Others	Total
Frequency of a word used in a scene	283	45	82	5	72	487
	58.1%	9.2%	16.8%	1.0%	14.8%	100.0%
Frequency of words in the same level used in a scene	113	31	48	5	46	243
	46.5%	12.8%	19.8%	2.1%	18.9%	100.0%

Table 3.4
Vocabulary in the 1st scene of 'Nodame Cantabile' (N1)

Vocabulary level *** (normal)						
	level 4	level 3	level 2	level 1	Others	Total
Frequency of a word used in a scene	151	36	38	11	29	265
	57.0%	13.6%	14.3%	4.2%	10.9%	100.0%
Frequency of words in the same level used in a scene	66	27	29	5	22	149
	44.3%	18.1%	19.5%	3.4%	14.8%	100.0%

Table 3.5
Vocabulary in the 2nd scene of 'Nodame Cantabile' (N2)

Vocabulary level **** (a little difficult)						
	level 4	level 3	level 2	level 1	Others	Total
Frequency of a word used in a scene	387	68	109	15	82	661
	58.5%	10.3%	16.5%	2.3%	12.4%	100.0%
Frequency of words in the same level used in a scene	119	43	70	13	55	300
	39.7%	14.3%	23.3%	4.3%	18.3%	100.0%

To choose these four scenes, the researcher considered not only the difficulty of the vocabulary but also the types of visual information in these scenes. In the first scenes of both Doraemon and Nodame Cantabile, the characters were talking or arguing at a certain place such as in a friend's house, in front of the house or in a bar. The pictures of these situations do not help the subjects to understand the content of the videos. The subjects have to listen to the characters' conversation to understand the content of the videos. On the other hand, the second scenes of Doraemon and Nodame Cantabile contain not only the picture of the situations where characters are talking but also the picture of characters' action or things characters talk about. These scenes enable the subjects to understand some content of the videos even if audio information is not provided.

The researcher went through the transcription and decided on the place to pause the video. They range from every 10 to 30 seconds. The purpose was to allow the subjects of this study to verbalize think aloud protocols while watching the videos as

well as to enable the researcher to pose probing questions that elicit the think aloud protocols. As a result, the Doraemon scene 1 was divided into 11 sub-scenes, the Doraemon scene 2 into 12, the Nodame Cantabile scene 1 into 6 and the Nodame Cantabile scene 2 into 20 sub-scenes. The complete list of sub-scenes is provided in Appendix E.

3.4 Procedure

The researcher met each subject individually and conducted training session individually with each subject. It was then followed by the data collection session.

Think aloud protocols were used in this study to collect the data of the subjects' thinking process while watching videos. This method enables researchers to collect the data of thinking process in the short term memory which is lost easily in retrospection (Ericsson and Simon, 1980; Garner, 1984 as cited in O'Malley et al., 1989). Researchers can also gather specific information that subjects are really conscious of during the task and not the general information that subjects is asked to report after several performances (White et al., 2007). While watching video, the subjects had to deal with a large amount of input in their mind. So it is important to collect data before it is lost. Previous studies proved that think aloud protocols were considered to be useful to collect data for such a study. (Vandergrift, 1997; Seo, 2002)

3.4.1 Training session

In this study, think aloud protocols were used to collect the information about the subjects' cognitive processes while watching the videos. This data collection method was unfamiliar to all the subjects. The researcher asked the subjects to speak out what they had in their mind while watching the videos. To get the subject to be familiarized

with this method the subjects were asked to undergo the training session of think aloud protocols before the researcher carried out the actual data collection. The training session consisted of three stages:

1) Think aloud while reading an article
2) Think aloud while watching short advertisements
3) Think aloud while watching a 10-minute-long video material

The subjects were asked to verbalize their cognitive processes. They could use any languages they like such as English, Japanese, Malay and Mandarin. Only after that the researcher started collecting data which consisted of think aloud protocols, verbal summary and interview from the subject who had gone through an average of 45-minute training. Both the training session and actual data collection were conducted on the same day. In the following three sections, the researcher explains each stage of the training session in detail.

3.4.1.1 Think aloud while reading an article

The purpose of this stage was to get the subjects to practice speaking out their thinking process when they were reading. For this purpose they were given enough time to think and speak after they had finished reading each sentence.

The article used in this practice was a 60-word paragraph about diving (Appendix B). This paragraph was deemed to be helpful for the subjects to verbalize their thinking process based on the content concerning the experience of diving.

The subjects were either asked to read the paragraph sentence by sentence aloud or silently at any speed they like. After reading each sentence they were asked to speak out what they had thought while reading the sentence. After they had finished reading the whole paragraph, the researcher asked some questions which would help the subjects to understand what they were required to report in this activity. The researcher

first asked whether they had any difficulties in understanding the article and what they thought when they had difficulties. Next, the researcher asked questions on *kanji* words (Chinese characters) and *katakana* words (i.e., Japanese words that indicated sounds or words imported from other languages). And then the researcher asked questions on images or pictures which the subjects had in their mind during reading.

3.4.1.2 Think aloud while watching short advertisements

The purpose of this stage was to help subjects to be able to speak out what they thought while watching videos.

Advertisements were assumed to have a lot of information and message to understand in a short time. Advertisements tend to pose difficulties for the subjects to understand the contents and to speak out their thinking process within a limited time. Three advertisements were used, one lasted 15-second and the other two 30-seconds each.

The subjects were asked to watch the advertisement and to speak out what they had been thinking while watching the scenes when the researcher paused the video. The researcher paused the video every 3 to 5 seconds depending on the content of the video. When the subject had finished speaking aloud the thinking process based on the scene he or she had already watched, the researcher would resume the video. This activity of watching the video and speaking out the thinking process during the pause, would continued until the advertisement ended.

The researcher would then ask some questions to encourage the subjects to verbalize their thinking process; for example, “Did you understand the conversation in the scene?”, “Did you read and understand the Japanese letters in the scene?, “Did you get any information from the picture in the scene?”, and “When you have difficulties, how did you try to solve them?.

3.4.1.3 Think aloud while watching a 10-minute-long video material

The purpose of this stage was to help the subjects to get used to verbalizing their thinking process while watching the videos.

The material used in this practice was an animation and it was considered not so crammed with information as in advertisements. The selection of this material was made based on the principle that it is similar to the materials (i.e., 'Doraemon' and 'Nodame Cantabile') used in the actual data collection.

In this practice the subjects were asked to watch the video and speak out their thinking process using the same procedure as in the advertisement practice. The subject was asked to watch the video and speak out their thinking process, as soon as the researcher paused the video. The researcher stopped the video every 10 to 30 seconds depending on the content. When the subject had finished speaking out the thinking process on the scene he or she had watched, the researcher resumed playing the video. In this study the researcher paused the videos at predetermined points so that the subjects had enough time to speak out their thinking process without experiencing memory overloading. These points were decided by considering the conversation of the characters in the video. In each sub-scene the character took one or a few turns in completing one topic.

The researcher would then check whether the subjects had any difficulties in speaking out their thinking processes. When they had difficulties in verbalizing their thinking process, the researcher would ask them questions, which was similar to those used in the advertisement practice in order to help learners to speak out what they think.

3.4.2 Data Collection

Three kinds of data collection methods were used in this study: 1) think aloud protocols, 2) verbal summary and 3) interview. First, while watching the video the researcher paused it and asked the subject to give as many comments as possible on what they had watched. Second, the researcher collected the verbal summaries produced by the subjects to gauge the subjects' understanding of the content of the videos immediately after watching it. Third, a face-to-face interview was conducted after the verbal summary. In this interview, the researcher collected information that the subjects had forgotten to report during the think aloud protocol session. The interview also served as a platform for the researcher to obtain subjects' perceived difficulties while performing the three tasks. These verbalized data was recorded and analyzed. In the following section the researcher explains the three data collection methods in detail.

3.4.2.1 Think aloud protocols

The purpose of this data collection was to collect information about the subjects' thinking processes while watching videos. As in the training session the subject was asked to speak out their thinking processes when the researcher paused the video. The researcher paused it based on the predetermined points and asked the subject to verbalize their thinking processes. The subjects tended to use English or/and Japanese though they were allowed to use any languages that they were most comfortable with such as English, Japanese, Malay and Mandarin.

To ensure the subject did not forget their thinking process, the researcher asked questions immediately after the subject verbalize the think aloud protocols during the pause. For example, did you do anything to solve the difficulty? (when they spoke out the difficulty in their understanding.) Why did you laugh then? (when they laughed but

did not report any information relating to that).

Furthermore, while the subject was verbalizing their thinking processes, the researcher noted the subject's behavior such as laughter and facial expressions which indicated surprise annoyance. These notes were used in the interview session conducted later for further investigation about strategy use and difficulties in understanding videos. The researcher used an observation form in Appendix C to keep a record of the subject's behavior.

3.4.2.2 Verbal summaries

The researcher chose two scenes each from the videos 'Doraemon' and 'Nodame Cantabile', respectively. Thus there were four scenes for the subjects to watch. After finishing each scene the subject was asked to make a verbal summary on what he or she had watched and understood in the scene. So in total four summaries were collected from each subject. Each subject made verbal summaries in English or Japanese though they were asked to use any languages they like such as English, Japanese, Malay and Mandarin.

3.4.2.3 Description of scenes

Below are the summaries of the four scenes used in this study.

Doraemon scene 1

Nobita (the main character) and his friends go to the house of their friend (Suneo) to see a dinosaur fossil. But Nobita is not given a chance to see it and gets angry. He promises to find out a complete set of dinosaur fossil. After he is badly laughed at by his friends, Nobita comes back home and asks Doraemon (a robot from 22nd century) to help him to find the dinosaur fossil. But Doraemon said it is impossible

and does not help him. So Nobita gets angry again and begins to study by himself.

Doraemon scene 2

Nobita gets a baby dinosaur and tries to rear it. Soon the dinosaur becomes bigger and bigger. Doraemon advises Nobita to send the dinosaur back to its time. After a discussion Nobita agrees with Doraemon. But Nobita insists that he should show the dinosaur to his friend before sending it back. One day when Nobita lets the dinosaur play in the garden, his mother comes in and nearly finds the dinosaur. When the dinosaur becomes too big to keep in his room secretly, Nobita hides the dinosaur in a pond.

Nodame Cantabile scene 1

Chiaki (the main character) is barred by his teacher from attending classes. Saeko (Chiaki's girlfriend) advises him to apologize, but he does not follow her advice. He tells Saeko that he is teaching himself to be a conductor of an orchestra and his only teacher is Mr. Vieira who taught him in Vienna a long time ago. Although he wants to go abroad to his former teacher, he can neither get on an airplane nor a ship because of his phobia. He had an experience of an airplane crash and was nearly drowned. He tells Saeko that he will quit his studies and wants to become a staff of the company of Saeko's father. Saeko gets angry and leaves.

Nodame Cantabile scene 2

Ryutaro (Chiaki's friend) asks Nodame (a girl who loves Chiaki) to prepare for an exam (violin and piano performance) together with him. But Nodame is too depressed to do any activity. Ryutaro gets worried and takes Nodame to make up with the man she loves. When they find the man, Ryutaro says she had better give up because

that man has a beautiful girlfriend. Ryutaro tries to persuade her to prepare for the exam. Nodame shows him a chain letter that she got. Due to this letter she does not want to do anything. After Ryutaro takes a look at it, he says it is foolish to believe such a letter and threw it away. Suddenly water is thrown down on them but both of them do not know who did that and where it came from. Nodame is teased by someone continuously and becomes unable to bare it anymore. So, together with Ryutaro, she catches the culprit and later finds out that the culprit is a gay and also loves Chiaki. The two decided to fight a duel to get the right to invite Chiaki for a date.

3.4.2.4 Interview

After the subject had finished watching the videos, 'Doraemon' and 'Nodame Cantabile', a semi-structured interview was conducted to collect more detailed information on the subjects' strategy use and their difficulties in understanding the videos. Questions for interview (Appendix D) were developed from the questions of Vandergrift's taxonomy (1996). These aimed at identifying the subjects' difficulties in understanding the videos and helped the subjects to remember what they had thought and what strategies they had used to solve these difficulties while watching the videos.

This interview was conducted in Japanese which was the shared language in which the subjects and the researcher communicated. First the researcher asked the subject to remember any difficulties in understanding the videos and the ways they solved them during video watching. And then, when the subject could not remember or specify their difficulties, the researcher would use the notes which had been taken during the think aloud protocol session to specify the parts that the researcher thought the subjects had some difficulties. The notes contained the subjects' behavior while they were watching the videos and verbalizing their thinking processes during the pauses.

3.4.2.5 Languages used by the subjects in data collection session

The data used in this research were collected from four proficient learners (PLs) and four less proficient learners (LPLs). The researcher conducted a series of think aloud protocol sessions, verbal summary sessions and interview sessions with these learners respectively. Those sessions were all recorded and transcribed by the researcher. Table 3.6 shows the languages used in these sessions.

Table 3.6
Language used in data collection

Less proficient learner (LPL)

	LPL 1	LPL 2	LPL 3	LPL 4
Think aloud protocol	Japanese	English	English	English
Verbal summary	Japanese	English	English	English
Interview	Japanese	English/ Japanese	Japanese	Japanese

Proficient learner (PL)

	PL 1	PL 2	PL 3	PL 4
Think aloud protocol	Japanese	Japanese	Japanese	Japanese
Verbal summary	Japanese	Japanese	Japanese	English
Interview	Japanese	Japanese	Japanese	Japanese

The interview sessions were conducted in Japanese, which is normally the language used between these subjects and the researcher. Only LPL2 answered in both English and Japanese. The think aloud protocols and verbal summaries were collected in the preferred language of the subjects, Japanese, English, Malay and Mandarin. Three less proficient learners (LPLs) carried out the think aloud protocols and verbal summaries in English, and only LPL1 did both in Japanese. All proficient learners (PLs) verbalized the think aloud protocols in Japanese. Three PLs did the verbal summaries in Japanese, while PL4 did it in English.

None of the subject used Malay or Mandarin although they had been told they could do so, and that the data would be translated into English. The decision for opting to converse in Japanese seemed to be related to the subjects' perceived ease of communication when interacting with the researcher who happened to be a Japanese. For example, LPL1 explained that she was thinking in Japanese while watching Japanese videos and verbalizing her thoughts in English or Mandarin was more difficult for her because she needed to translate those thoughts into other languages.

3.5 Data Analyses

The data recorded during data collecting sessions were transcribed and then analyzed. In this section, the researcher discusses the data analysis plan which consists of transcribing, translation and development of coding framework including the discussion with external coder.

3.5.1 Translation

Since the researcher is not able to understand the subjects' first language (L1), which is Malay or Mandarin, the researcher planned to ask a Malaysian teacher of Japanese Language to listen to the tapes of the subjects' L1 verbalized data (think aloud protocols and verbal summaries) and to translate them into English. However, since all the subjects responded in English or Japanese, it was deemed unnecessary to carry out translation on the interviews.

3.5.2 Transcription

The audio data recorded during the think aloud protocol sessions, the verbal summary sessions and the interview sessions were transcribed and this was followed by a coding process, which will be elaborated further in the following section. The transcript of the study was carried in a verbatim manner.

3.5.3 Coding

In this study the researcher used Vandergrift's taxonomy (1997) as a coding framework to analyze the strategies used by the subjects. However, some modifications were made because this study focused on video comprehension, while Vandergrift's taxonomy was developed for listening comprehension.

First modification was made on *Inferencing* which is one of the cognitive strategies in the Vandergrift's taxonomy. Inferencing is a strategy in which subjects use information within the text or conversation context to guess the meanings of unfamiliar language items, to predict outcomes, or to fill in missing information (Vandergrift, 1997, p.393). Vandergrift divides Inferencing into five subcategories. These five subcategories were developed from his study on listening comprehension. The five subcategories are as follows:

1) *Linguistic inferencing* - using known words in an utterance to guess the meaning of unknown words
2) *Voice and paralinguistic inferencing* - using tone of voice and/or paralinguistics to guess the meaning of unknown words in an utterance
3) *Kinesic inferencing* - using facial expressions, body language, and hand movements to guess the meaning of unknown words used by a speaker

4) *Extralinguistic inferencing* - using background sounds, concrete situational referents to guess the meaning of unknown words

5) *Between parts inferencing* - using information beyond the local sentential level to guess at meaning.

The present study dealt with learners' understanding of video content. By watching the selected videos, the viewers were able to generate both audio and visual clues from the various elements in the video. Generating audio and visual clues help the subjects in understanding the content of the videos. The researcher had made some modification on Vandergrift's taxonomy of inferencing and developed an adapted taxonomy. In this study the researcher considered inferencing as a strategy in which subjects use information in the video to construct meaning or to fill in missing information. It consists of three inferencing strategies: 1) audio inferencing, 2) visual inferencing and 3) between parts inferencing. The researcher initially divided audio inferencing and visual inferencing into three strategies respectively before carrying out data collection. After the data were collected and an external coder and the researcher coded some of the data of this study, further modification was made on audio inferencing, visual inferencing and some other strategies. The external coder was a Japanese who was also a Japanese language teacher with 5 years of Japanese language teaching experience. The reason for choosing this external coder was to ensure the inter-rater reliability of the coding process. As a result of discussion with the external coder, it was decided that the audio inferencing and the visual inferencing were re-categorized from three strategies into two strategies respectively. Audio inferencing was divided into the next two subcategories:

1) *Audio linguistic inferencing* - using known words in an utterance to guess the meaning of unknown words, which is adapted from to Vandergrift's linguistic

inferencing

2) *Audio non-linguistic inferencing* – using paralinguistic features such as tone of voice and/or audio clues in videos such as background sounds to guess the meaning, which is developed from Vandergrift's voice and paralinguistic inferencing and extralinguistic inferencing

Visual inferencing is also divided into the next two subcategories:

1) *Visual linguistic inferencing* - using linguistic clues in videos such as newspaper and signboard to guess the meaning, which is adapted from Vandergrift's linguistic inferencing

2) *Visual non-linguistic inferencing* - using body language such as facial expressions and/or visual clues such as pictures and images in videos, which is developed from Vandergrift's kinesic inferencing and extralinguistic inferencing

And Vandergrift's last inferencing strategy (Between parts inferencing) was used in the present study as well. This taxonomy of inferencing was used to analyze the subjects' cognitive strategy use and to answer the Research Question 1 in this study. The differences in inferencing strategy between Vandergrift's study and the present study are shown in Table 3.7.

Table 3.7
Differences in inferencing strategy used between Vandergrift's study and the present study

Vandergrift (1997)	This study
Linguistic inferencing	Audio linguistic inferencing Visual linguistic inferencing
Voice and paralinguistic inferencing Extralinguistic inferencing	Audio non-linguistic inferencing
Kinesic inferencing Extralinguistic inferencing	Visual non-linguistic inferencing
Between parts inferencing	Between parts inferencing

The second modification was to reduce the number of types of strategies and to simplify the taxonomy. This modification was also made based on a discussion between the external coder and the researcher. The external coder and the researcher found that strategies were divided into too many types in Vandergrift's taxonomy and coding was difficult. So after discussing, both the external coder and the researcher decided to simplify the taxonomy. For example, socioaffective strategy was removed from the list because in this study on watching videos, the subjects do not have opportunities to use this strategy. Some cognitive strategies such as note taking and resourcing were also removed from the list. Metacognitive strategies have four categories and each category has a lot of subcategories. However, these subcategories were put together into two categories because they were not relevant to this study. Appendix A is the new taxonomy developed as a result of the discussion. This taxonomy was used to code the strategies in this study.

In the actual coding process the researcher read each verbal report provided by each subject during the pauses and divided it into some smaller parts based on content. And then the researcher analyzed each part based on the strategies subjects had used to construct meaning and labeled codes according to the taxonomy mentioned above.

3.5.4 Reliability checks

The researcher passed one document on to another Japanese teacher for external coding to establish inter-rater reliability. This document consisted of randomly selected parts from the transcripts of think aloud protocols and interviews of each of the subjects in this study.

This document was made by allocating the data of each subject randomly. First the researcher divided each scene of Doraemon into two parts and got four parts which had similar length. In the case of Nodame Cantabile, the first scene was short and the

second scene was long. The researcher divided the second scene into three parts and got four parts in total which had similar length. Second, the researcher randomly assigned the data of one subject from PL and LPL onto each part of Doraemon and Nodame Cantabile. As a result, the researcher obtained documents including transcripts of think aloud protocol and interview as in table 3.8.

Table 3.8
First coding of the data randomly assigned for reliability check

	Doraemon				Nodame Cantabile			
	Scene 1		Scene 2		Scene 1	Scene 2		
LPL	3	2	1	4	1	4	2	3
PL	1	2	4	3	1	4	2	3

When the external coder finished coding all the LPL's transcripts and the first transcript of the PL, the external coder and the researcher found some discrepancies in coding mentioned above. So the researcher compared the coding of the external coder and the researcher by calculating inter-rater coefficiency. The inter-rater coefficiency was 0.65. The formula used in this calculation is the formula from Murphy (1985, as cited in Young 1997) and Scholfield (1994, as cited in Young 1997) .

$$\text{Inter-rater coefficiency} = \frac{\text{number of strategies coded the same by Researcher and External coder}}{\text{number of strategies coded by Researcher}}$$

After the first coding, the external coder and the researcher encountered some problems in the coding process. The detailed taxonomy caused much difficulty in identifying strategies. After discussion, some modification was made on the list of strategies. First, inferencing strategies were re-categorized into five sub-categories (refer to Table 3.7) from six sub-categories which were developed for video comprehension, as Vandergrift's taxonomy is meant for listening comprehension. Second, metacognitive strategies were changed from four categories into two categories. Third, academic elaboration was changed into personal elaboration because it was a strategy which deals

with knowledge attained by personal experience or learning. The taxonomy mentioned in section 3.5.3 was produced based on this adaptation. The coding was again done on the documents which included transcripts as shown in table 3.9.

Table 3.9
Second coding of the data randomly assigned for reliability check

	Doraemon								Nodame Cantabile							
	Scene 1				Scene 2				Scene 1		Scene 2					
	LPL	LPL	PL	PL	LPL	PL	PL	LPL	LPL	PL	LPL	LPL	PL	PL	PL	LPL
	2	4	3	1	1	4	2	3	3	3	1	4	1	2	4	2

This document was also made by allocating the data of each subject randomly. First the researcher divided each scene of Doraemon into four parts and got eight parts which had similar length. In the case of Nodame Cantabile, the first scene was short and the second scene was long. The researcher divided the first scene into two parts and the second scene into six parts and got eight parts in total, which had similar length. Second, the researcher randomly assigned the data of one subject onto each part of Doraemon and Nodame Cantabile. As a result, the researcher obtained documents including transcripts of the think aloud protocol and interview as shown in table 3.9.

The external coder and the researcher labeled codes again on this document. The researcher then calculated the inter-rater coefficiency based on the formula above. The inter-rater coefficiency reached 0.73. This number (0.73) indicates 70 % agreement between two coders. It shows improvement from the first coefficiency 0.65 calculated after first coding. Thus, the coding framework was adopted.

3.5.5 Data analyses procedure

In this study, the researcher analyzed the collected data based on three research questions. Each research question was answered in the procedure as follows.

3.5.5.1 Research Question 1

In answering Research Question 1, i.e., learners' comprehension strategies, the data of think aloud protocols and interviews were analyzed. These data were coded based on the taxonomy mentioned above, which is adapted from Vandergrift's (1997) taxonomy, and then analyzed to compare the differences of strategy use by PLs and LPLs.

3.5.5.2 Research Question 2

To answer Research Question 2, i.e., learners' difficulties in video comprehension, the researcher analyzed the data of the think aloud protocols and interviews. The think aloud protocols and interviews were analyzed in terms of distracting factors perceived by both PLs and LPLs, by only LPLs and by only PLs while watching the videos.

3.5.5.3 Research Question 3

As for elements which assisted video comprehension (Research Question 3), the researcher examined the data of think aloud protocols and interviews. Think aloud protocols were analyzed in terms of subjects' use of visual and linguistic clues in the videos. The researcher examined the verbal summaries to trace the pattern between verbal summary which shows the subjects' correct understanding of the videos and think aloud protocol which will reveal the subjects' difficulty in understanding the video content. And then the researcher will analyze the data of think aloud protocols and interviews again in order to collect more information and justify the occurrence of such pattern.

3.6 Triangulation

Triangulation is the process to validate findings. Ellis and Barkhuizen (2005, p.49) described triangulation as "the use of two or more data collection methods in order to search for points of convergence." Creswell (2008) described this process more in detail as follows:

> Triangulation is the process of corroborating evidence from different individuals (e.g., a principal and a student), types of data (e.g., observational fieldnotes and interviews), or methods of data collection (e.g., documents and interviews) in description and themes in qualitative research. The inquirer examines each information source and finds evidence to support a theme. This ensures that the study will be accurate because the information draws on multiple sources of information, individuals, or processes. In this way, it encourages the researcher to develop a report that is both accurate and credible. (p.266)

Figure 3.2 shows the triangulation process of data used in this study.

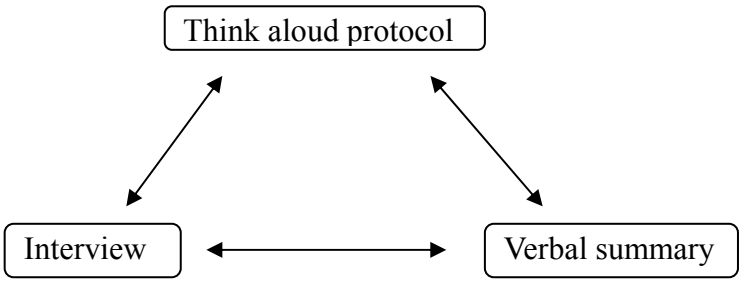

Figure 3.2
Triangulation in this study

In this study the researcher conducted three kinds of data collection: think aloud protocol, verbal summary and interview. Each set of data would be used in order to examine in more detail the findings obtained in one data collection method with the data obtained in other method, and to support the findings in the data collection process from different data sources.

The think aloud protocol session is expected to allow the researcher to collect strategies used by the subjects and factors distracting and facilitating the subjects' understanding of the videos. The researcher would collect detailed information of the strategies and trace the factors which facilitate and distract understanding from the think aloud protocols. Interview is used to verify and explain the findings of the think aloud protocols. The interview also allows the researcher to detect difficulties faced by the subjects while watching the videos and to get more detailed information of factors distracting or facilitating the subjects' understanding of the videos. The verbal summary would enable the researcher to verify the findings found in the think aloud protocols as well. The subjects' understanding of the videos (which is obtained in think aloud protocols) would also help to reconfirm the data of the verbal summary.

The combination of these three methods would enable the researcher to enhance the understanding of the subjects' thinking processes while watching the videos and to enhance the accuracy and credibility of the findings.

3.7 Summary

In this research, eight subjects were investigated in their thinking processes while watching videos. Two video materials were used and two scenes were selected respectively. The researcher met the subjects individually and conducted training sessions with three types of material, an article, advertisements and a movie, followed by data collecting session which included three kinds of data collection methods, think

aloud protocol, verbal summary and interview. These data were recorded and transcribed. Taxonomy for coding the data was developed from Vandergrift's taxonomy and completed after discussion with the external coder. Then the data was analyzed based on three Research Questions.

In this chapter the researcher described the procedure for selecting the subjects, training session for think aloud protocol, actual data collection session and data analyses. In the next chapter the researcher describes the data analysis procedure and findings based on the three Research Questions.