

A Comparative Study of the Effectiveness between Audio medium and Video medium in Teaching English.¹

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This paper examines the effectiveness of the audio-visual and audio media in listening comprehension for English language classrooms at university level. Motivation on the affective domain is also investigated to see if there is a correlation with their effectiveness. The t-test is used as a method of statistic analysis to analyze the following five hypotheses : 1) Using the audio-visual media would be effective in listening comprehension. 2) Using a video medium would be more effective than using only cassette tapes in listening comprehension. 3) Using a video medium would be more effective than using only cassette tapes in listening comprehension for a less-advanced level of language proficiency. 4) There would be no difference between the two in listening comprehension for an advanced level. 5) Using the video medium would motivate students more to study English than using only cassette tapes. The results of this study support the first and fourth hypotheses but not the second, third and fifth.

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I. INTRODUCTION

The Ministry of Education of Japan has set broad, national goals in middle and high school English education for the development of communication skills. Tokyo University and other institutions have already implemented a listening comprehension test as part of their entrance examinations. Teaching listening and speaking skills has already been identified as a very important component of Japanese English education. With this development in English education in Japan, the effectiveness of using audio-visual materials in the classroom has become the subject of nearly every meeting of English language educators lately.

Without question, the teacher's ability in English is the most important factor in the classroom. This ability alone, however, will not maximize the effectiveness of teaching communication skills in the EFL (teaching and learning English as a foreign language) classroom situation which exists in Japan. Satoko Nazawa in the *Daily Yomiuri* newspaper on November 8, 1990, discussed the problems English teachers have, and recognized that the appropriate teaching materials and instruction are important for enhancing communication skills.

Appropriate teaching materials and instruction are presently being studied and discussed among researchers and teachers. Visscher (1990) discusses the use of audio-visual materials, and says that videos have been avoided in the classroom by teachers because of the uncertainty of their use and effectiveness.

There are, however, some studies showing specific methods for using videos in the classroom (Loneragan, 1984 ; Stempleski and Tomalin, 1990 ; Wright, 1976 ; Allan, 1985), but there are not many studies on

examining the effectiveness of the medium itself, to my knowledge. The author would like first to review the literature concerning the use and effectiveness of the audio-visual media, and then discuss a comparative study of the effectiveness of the two media : audio-visual medium (using a video tape) and audio medium (using a cassette tape).

This paper investigates the effectiveness of the audio-visual and audio media in terms of listening comprehension. The affective domains are also investigated in terms of the correlations with the listening comprehension tests.

II. THEORETICAL BACKGROUND : REVIEW OF THE LITERATURE

Neuro-psychologically speaking, it has been believed that the audio-visual media represented by video tapes and films (these are called, "video media" from now on) are more effective in language teaching than audio media represented by cassette tapes (these are called, "audio media" from now on) (Tanaka, 1980). The ratios of the correlation for the amount of information between visual and auditory input are 83 to 11 : 83 percent of the information is absorbed visually, 11 percent auditorily, and the remaining 6 percent is absorbed due to other factors (Tanaka, 1980 : p. 17). Visscher (1990) also notes the visual advantages over auditory : "In the hierarchy of perceptual intake, furthermore, the visual always takes precedence over the auditory (p. 7)." Thus, the power of videos originates from this unbalanced ratio of informational intake between visual and auditory media. Some of the advantages of using video media in the classroom for motivating students in class activities, introducing the language with its situational contexts, visualizing socio-cultural information, and introducing non-verbal communication skills can be attributed to the visual power produced by the video media.

The advantages of using video media for instruction have been discussed by a number of researchers for several decades. Forsdale and Dykstra (1963) discuss the effectiveness of using films in the language classroom. They especially stress the impact on the students' interests in the teaching material, which in turn generates student participation in class activities. They also recognize some other significant advantages in the use of film : it allows students to interact with a range of accents of native speakers of the language, and with the language related culture and habits through visual intake.

Other researchers in the 1960's (McLuhan, 1964 ; Gattegno, 1969) examined the affective power of video use in the classroom ; they cited, for example, the empathetic effects. They also discussed why the television/video medium carries such power, and how the screen has changed the classroom atmosphere. They predicted that the video would change the world of language teaching.

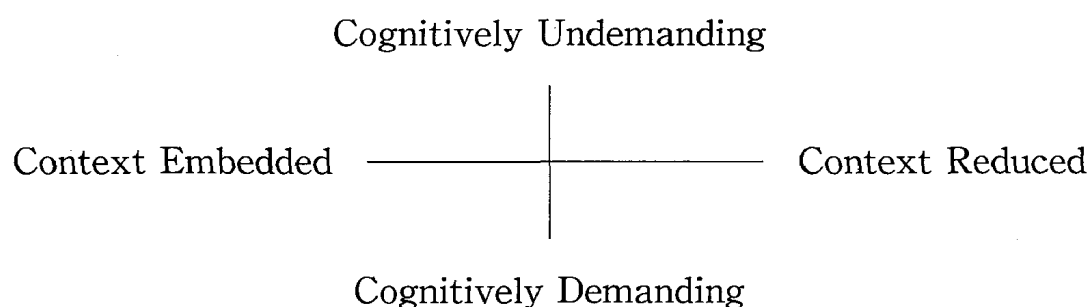
Lonergan (1984) discusses the role of the medium, teacher and learner, communicative value of videos, and their effectiveness in the language classroom. He states that one of the major benefits of videos is that they bring "real life" into the language classroom. Thus, video media give the students situations in which they are engulfed in the story and plot. As Visscher (1990) stated, the substantial benefits of videos such as acquiring body language skills, spatial and gestural concepts, voice intonation, and other socio-cultural factors are absorbed by the students.

One of the factors of language acquisition is acquiring non-verbal communication skills, which coincide with linguistic factors. Non-verbal communication is, however, not easily acquired by the students in a foreign country such as in Japan unless students go to the country and live

in an environment where the language is spoken. There are some discussions about this advantage in the use of videos in order to present and teach such non-verbal communication skills (Visscher, 1990).

In communication skills, there are generally two phases to be considered. One is verbal dominant communication which applies to academic language skills, and the other is non-verbal dominant communication which mainly applies to face-to-face everyday communication skills. According to Cummins (1983), the academic language skills presuppose face-to-face communication skills in which less cognitive tasks are demanded and a complete context with gestures and facial expressions is embedded. It is easier to comprehend a message if the full context is available. If there is comprehensible input, the acquisition of the language takes place more readily (Krashen and Terrell, 1983).

Cummins (1983) discusses communicative proficiency in terms of two continua in the context and the cognitive points of view. According to Cummins, contexts play significant roles in expressing or receiving meanings: "context-embedded" vs. "context-reduced" communication. He refers to context-embedded communication in which "the participants can actively negotiate a meaning (e.g., by providing feedback that the message has not been understood) and the language is supported by a wide range of meaningful paralinguistic (gestures, intonation, etc.) and



situational cues" (p. 11). Many researchers cite these as advantages in the use of video.

Context-Reduced communication, as Cummins (1983) states, depends primarily on verbal cues to comprehend the message and manipulate the logic of communication appropriately. Since there are fewer contextual cues and shared reality, only linguistic messages become the means for mutual communication. The diagram above shows the two phases (Cummins, 1983).

Communicative behavior from left to right of this continuum (Cummins, 1983) can be interpreted as going from engaging the visual context in the video to listening comprehension through a cassette tape. The vertical continuum represents "the developmental aspects of communicative competence in terms of the degree of active cognitive involvement in the task or activity" (Cummins, 1983, p. 12). This depends on the students' level of proficiency in such areas as grammar, phonology, etc. and on classroom activities using audio and audio-visual media. Generally speaking, situations which are easy for students to handle in the classroom such as recognizing a word are cognitively undemanding, but reasoning out of contexts is cognitively demanding.

In regard to context-embedding and language use, Stempleski (1990) states clearly that the combination of audio elements with visual paralinguistic factors such as culture and customs facilitates understanding and retention of language use.

Visscher (1990) also suggests starting from non-verbal components to reach understanding. The visual components he raises are especially proxemic and kinetic aspects, which correspond to Cummins' (1983) model: "development of communicative proficiency." This idea also supports Krashen's (Krashen and Terrell, 1983) "Input Hypothesis."

Visscher concludes his paper by saying that this leads students to active viewing through affective (i.e., motivation, empathetic, personalized and impersonated) interaction with the medium (see also Seliger, 1983). This gives students a reason to listen attentively in order to comprehend the contents in more detail.

There are some other studies which show a correlation between the visual elements and the linguistic elements. Stempleski and Tomalin (1989) state, "...most advocates of using video in language teaching have focused on using the medium for comprehension practice or the presentation of new language" (p. 21). Kitao (1986) also suggests giving "students a list of new vocabulary items which appear in order to help them understand the material" (p. 21). Cooper (1990) indicates that video is a powerful teaching tool since the aim of its use is for stimulating as well as contextualizing language use. Learners pick up much language from real-life situations, and social-context : who was saying what to whom, where, and when. Bits of language are stored in the memory along with their social context (Natusch, 1990).

The language produced by students of English will reflect the language used in videos they have seen (Loneragan, 1984 p. 60). Students will absorb the language unconsciously by being engulfed in the video scene ; this is much like picking up the language in the country where the language is spoken (see Krashen and Terrell, 1983).

Although there are a number of advantages in the use of video as stated above, some researchers have also found drawbacks as well.

First and most importantly, we cannot forget the fact that videos as well as cassette tapes are only useful aids for the language teacher and cannot replace the teacher (Visscher, 1990 ; Loneragan, 1984 p. 5 ; Takai, 1984 p. 114). The teacher's methodology makes great difference in the

students' language acquisition. The teacher is indispensable in the language classroom.

Second, an authentic video is usually made for entertaining native speakers. It is no wonder that teachers of language have avoided using videos in the classroom since videos are made for entertainment purposes and do not necessarily have instructive value (Visscher, 1990). This visual entertainment may inhibit students' consciousness in listening comprehension (Lonergan, 1984). Students are sometimes too engrossed in the action of videos and do not gain the benefits of listening to the dialogues. Kitao (1986) mentions the same disadvantage of using videos in the classroom: "Action-adventure movies are popular, but in some cases, students may be able to understand much of the plot without having to listen to the dialogue" (p. 20). Besides, students assume that a class in which video is used is for entertainment and non-pedagogical purposes (Visscher, 1990).

Third, the advantage of visual over audio intake of information can sometimes become a disadvantage. For example, when we drive a car while listening to the news in our native language and the traffic becomes congested, we tend not to pay attention to the radio but that which is in front of us: our brain has a mental priority turn-off switch. Whatever characteristic is of importance, or interest; we will focus on that factor and turn off the rest. The visual perception sometimes interferes with attention to sounds of the class. Thus, if the teacher asks students to pay attention to the audio as well as the visual aspects of video, the task is almost impossible (Visscher, 1990).

This suggests that visual inputs be used as intended: for understanding non-verbal communication or for presenting a situation which students can utilize in developing their language. For listening practice,

students should be attentive to the sounds only. Verbal language cannot be taught simply by showing pictures on the video.

Fourth, one of the characteristics of video use, introducing “real life”, is challenged by Viney (1990). The drama performed on videos has dynamic, pace and repetition factors which are very different from the real situation since the drama itself is based on artificial performance to entertain a native speaker audience. Therefore, the dialogues in the video has been scripted, read, rehearsed, and memorized by the performers. This is hardly the case in a spontaneous, non-rehearsed, real life situation.

Fifth, the effectiveness of the authenticity of videos is challenged if the videos are used for lower-level students. Morley and Lawrence (1971) state that the natural speed and vocabulary used in videos creates substantial problems for less proficient students. From his own experience, Viney (1990) notes that he eventually ends up only explaining vocabulary and phrases and never reaching the comprehension activities when using authentic materials in his language classroom.

Sixth, there are some videos with the purpose to show how to use a word or a phrase in context through oral repetition. This differs from showing students a situation and having them create the same or similar situations in order to develop their language use (Visscher, 1990). This criticism corresponds with the one leveled against audio-lingualism in the 1960's. Mimicking or parroting does not facilitate the acquisition of language (Krashen and Terrell, 1983).

Seventh, considering the characteristics of videos, the important thing is that “the visual is instantaneous and synthetic while speaking and writing is linear and analytical” (Visscher, 1990). Since a video has an immediate visual impact, the students tend to pay attention. When

asked about a film, however, students will give only their impressions rather than more detailed explanations about the contents of the film. Since the visual aspect only happens once, all verbal and non-verbal information is consolidated together. Students usually don't have time to analyze this information, and end the viewing with only a cursory impression of the video. Accordingly, the questions in follow-up class activities with video tend to be display questions such as "how many boys were there on the bridge?" These questions are not cognitively demanding, causing students to lose interest in class activities with videos.

Eighth, if you use authentic videos, there can be so many idiomatic dialectical expressions or even gestures special to a particular culture (Visscher, 1990). Even native speakers of English cannot understand some regional dialects. It is a waste of time and frustrating for students and teacher alike to struggle to understand these expressions and gestures.

Finally, the length of videos can be a drawback since most videos range from one to three hours. This makes it difficult, although not impossible, to fit videos into a regular class schedule. Teachers who plan to use videos need to make adjustments to accommodate film length (Edasawa et al., 1989).

From the review of the literature on video use, it seems that teachers can utilize the full visual impact of videos to motivate students and to facilitate their comprehension of the language in a dramatized situation. On the other hand, the difficulty in language and the speed of the dialogues can be drawbacks. These drawbacks seem to be primarily attributable to confusion about how to use a video, and also to a lack of information on the effectiveness of videos in facilitating language learning and acquisition.

There are, however, a few empirical studies that have investigated the effectiveness of using videos in teaching English for various purposes. In his experimental study of rapid reading, Sekiya (1981) reports the effectiveness of using videos for speed reading. The results of his study show significant improvements in students' reading ability in terms of speed and comprehension.

When videos have been used in the classroom, their purpose has almost always been for improving listening comprehension skills. There have been some empirical studies investigating the effectiveness of video used on listening comprehension. According to Edasawa et al. (1989), Yoshida (1976) compares the effectiveness of using two different kinds of films on two groups : one group is presented with only the soundtrack of the films, and the other group views the films with the soundtrack. She reports that the group presented with both films and soundtrack together shows better results on listening comprehension tests than the other group with the soundtrack only. She also reports that the results are the same for both groups, if the content and vocabulary of the video are highly above the students' language proficiency levels.

Takai (1984) investigated the effectiveness of videos and conventional audio tapes on listening comprehension. He reported that there was no significant difference between the two media. However, motivation was significantly higher when using videos. He also drew the conclusion that the teacher is not replaceable with any media in the classroom. This study was, however, cross-sectional and there were no pre- or post-tests. The period under examination should be longer to yield significant results.

Edasawa et al. (1989) discuss the effectiveness of using a video to motivate students in the language classroom and state that even though

there is no statistical significance in results of tests in listening comprehension, the video motivates students to study English in the classroom. There are, however, some shortcomings in their studies as they stated in their paper. They used three different teachers to compare the effectiveness of the media. It seems that three teachers have their own teaching principles and individual teaching styles, which may have affected the results of the study. The experimental period was noted as three months, which may have been too short to yield significant results.

III. HYPOTHESES TO BE TESTED

Reviewing the trends in the use of video media and most recent empirical studies, we can recognize many advantages in using videos in the language classroom. The most powerful advantage is the effectiveness as an attention-getter which eventually motivates students to engage more actively with language learning. Second, language used in the video is always contextualized with a situation and other non-verbal communication such as facial expressions and body language. This context-embedded orientation helps to make the language in use more comprehensible to students. This must enhance making students' listening comprehension easier than listening comprehension exercises without videos. The author would like to state the hypotheses to be tested in this paper as follows :

Hypothesis 1 : Though some Japanese university students have been heard saying that their ability in English has declined since they entered a university, their listening comprehension skills would improve by using audio-visual media.

Hypothesis 2 : Using videos in the language classroom gives more comprehensible input to students than using only cassette tapes for listen-

ing comprehension practice. Therefore, the group using a video medium should gain higher scores than the group using only cassette tapes on listening comprehension tests with the pretest and post test research design.

Hypothesis 3: According to the Cummins' model (Cummins, 1983) and Krashen's Input Hypothesis (Krashen and Terrell, 1983), less-advanced students are able to enjoy the benefits of visual context for better comprehensibility of the language. In less-advanced levels of language proficiency, therefore, the group using a video medium would gain higher scores on listening comprehension tests than the group using only cassette tapes.

Hypothesis 4: In advanced levels of language proficiency, however, there would be no difference in the gain scores between the two groups.

Hypothesis 5: As many researchers advocate, using videos motivates students to study language. Therefore, motivation among students in the class using videos would be higher than the ones using only cassette tapes.

IV. METHOD

Two English classes (named 'IFC' and 'IMB' in the 1990 academic year) were chosen in order to investigate gain scores between the first test (hereafter called the pretest) and the second test (hereafter called the post test) in this study. Students in these classes are all freshman in the night course curriculum at the Otaru University of Commerce, Junior College. Each class is held once a week. In these classes, English is taught as a required subject in the general education curriculum. The students are majoring in either Economics or Business; there are no English majors

in this college. These classes were taught by one Japanese teacher of English (the author himself) for the academic year of 1990 using two different media : audio tapes and a video. The language of instruction in the classes was English except for detailed explanations of English grammar and its usage. English is used approximately 90 percent of each class session.

A Task-Based Listening Course : Listen For It by Jack Richards et al. was used for the class of IMB (hereafter called "Audio group"). It consists of audio tapes, and a textbook which contains 17 different topics in daily life in an American cultural context. The speed of the dialogues on the audio tape is 116 words per minute.² One of the objectives for improving listening comprehension skills in this group's course plan was to be able to understand colloquial English without reading dialogues. Class activities mainly followed the sequence of the exercises presented in the textbook.

For the class of IFC (hereafter called "Audio-visual group"), *Your Life In Your Hands : a video course for high beginners, student's book 1* written and edited by Joseph J. Deliso was used. This course, whose theme is a romance story, comes with a video tape and student's book with eight units. The theme of the video is based on American everyday life with an orientation toward American colloquial English. The speed of the dialogues is 139 words per minutes.³ Both groups share the same objective : to be able to understand colloquial English without reading

² For this measurement, dialogs were taken and transcribed from the first unit of the book in order to comply with the other group. Then, the numbers of words were counted per minute.

³ *ibid.*

the dialogues. Class activities for the most part followed the sequence of the exercises in the textbook. In order to comply with one of the objectives in these classes of improving listening comprehension skills, audio tapes were prepared by using the video soundtrack. The class activities were basically divided into three phases : viewing the video without sound, listening to the audio tape for the listening comprehension practice, and viewing the video with the soundtrack. The groups, classes, and subjects of this study are summarized in Table 1.

The JACET listening comprehension test form A : part 1 through 4 (hereafter called the JACET test) was used for the pre- and post-tests to measure students' progress in listening comprehension. The total score on the test from part 1 through 4 is 40 points. The first test (pretest) was conducted in May, 1990, and the second test (post test) in February, 1991. Students were given mark cards for the answer sheet, and the instructions and problems were given through the pre-recorded tape with an audio cassette tape in the AV Hall (Audio-Visual equipped classroom). Students left the room without any information on the contents of the test with them. The mark cards were collected, and notes were not allowed to be taken while listening. Since the nine month period between the two tests was long enough for students to forget the contents of the test, the first test would not negatively affect the results of the second test. Statistics showing the homogeneity of the students' listening comprehension skills among groups are shown in Table 2.

Table 1. Groups, Classes, and Subjects

Audio-Visual Group	IFC, 1990	n=33
Audio Group	IMB, 1990	n=32

Note : 'n' stands for the number of students.

Table 2. T-test for Homogeneity of two groups for Proficiency.

Variable : Pretest						
Group	N	Mean	STD DEV	STD Error	Minimum	Maximum
Audio-Visual	30	20.53	6.63	1.21	8.00	35.00
Audio	28	18.25	5.89	1.11	4.00	31.00
Variances	T	DF	Prob > T			
Unequal	1.3888	55.9	0.1704			
Equal	1.3830	56.0	0.1722			
For H0 : variances are equal, F=1.27 with 29 and 27 df						
Prob > F= 0.5355						

Note : 'N' stands for the number of students, 'STD DEV' stands for the Standard Deviation, 'T' stands for t-value, 'DF' (or 'df') stands for the degree of freedom, and 'Prob' stands for the probability. The values are rounded off to the nearest hundredth.

Table 2 shows that the two groups' mean scores on the pretest were compared and tested to see if there is a statistically significant difference between the two means using independent groups t-test. The following is an explanation of Table 2 :

The independent variable is the Audio-visual group compared with the Audio group, and the dependent variable represents the scores of the pretest. The null hypothesis states that the Audio-visual group does not differ from the Audio group from the results of the pretest (H0 : Mean of Audio-visual group = Mean of Audio group). The number of samples in the Audio-visual group is 30, and in the Audio group 28. These numbers are different from the numbers shown in Table 1, because three students in the Audio-visual group and four in the Audio group did not participate in the pretest. These numbers of absent students cannot be read by the SAS computer programs (the SAS package of statistical

programs).

In t-tests for small samples, calculation of the t-test is different according to the following cases : 1) Two variances do not differ by an amount that is statistically significant, and 2) they do differ statistically. Therefore, according to the result of the F-test, the appropriate t-test will be chosen and calculated.

The null hypothesis, stating that the variances of both groups are equal (H_0 : variances are equal), is tested by using the F-test. As a result, the F-ratio ($F=1.27$) is obtained with 29 and 27 degrees of freedom. Since the probability of the F-ratio is larger than the .05 confidence level of the critical value ($\Pr [F > 1.27] = 0.5355$), the null hypothesis is not rejected, which means that the difference between the two variances is not significant. Therefore, the t-test under the equal variances in Table 2 is appropriate to be chosen for the calculation ($t=1.3830$ with 56 degrees of freedom). Since the probability of the t-value is larger than the .05 confidence level of the critical value ($\Pr [| t | > 1.3830] = 0.1722$), the null hypothesis (H_0 : Mean of the Audio-visual group = Mean of the Audio group) is not rejected, which means that there is a homogeneity among these two groups under the results of the pretest.

In order to strengthen the homogeneity of the groups, the students' motivation was investigated by giving a 32-item questionnaire in February, 1991. Each question allowed students to rank their answers on a five-point scale (see Table 3 below). The following 5 questions were chosen to define the motivation in this study : The questions include whether students like English or not (Q5 in the questionnaire), the need for English today (Q6), the need for English in the future (Q7), whether they like the content of the materials in each class (Q12), and the percentage of their attendance during the year (Q32). In the case of these questions,

Table 3. Questions Concerning Motivation.

Q 5 . Do you like English ?					
very much dislike	_____				I like it very much
1	2	3	4	5	
Q 6 . Do you feel you need English now ?					
Not at all	_____				Yes, very much so.
1	2	3	4	5	
Q 7 . Do you feel you will need English in your future ?					
Not at all	_____				Yes, very much so.
1	2	3	4	5	
Q12. Are you interested in the contents of the textbook you are using in the class ?					
Boring	_____				Very interesting.
1	2	3	4	5	
Q32. What is the percentage of your attendance in this class ?					
Less than 40%	_____				More than 80%
1	2	3	4	5	

Table 4. T-test for Homogeneity of Two Groups for Motivation.

Variable : Motivation					
Group	N	Mean	STD DEV	Minimum	Maximum
Audio-Visual	33	4.12	0.34	3.60	4.80
Audio	32	4.04	0.49	3.00	4.80
Variances	T	DF	Prob > T		
Unequal	0.6770	55.2	0.5012		
Equal	0.6807	63.0	0.4986		
For H0 : variances are equal, F=2.06 with 31 and 32 df					
Prob > F=0.0463					

Note : The values of the descriptive statistics are rounded off to the nearest hundredth.

the higher scores indicate better or higher motivation.

Scores were added up, and divided by 5 to obtain an average score using for the homogeneity test of motivation in the two groups. The reliability for the accuracy for the features of motivation will increase as the number of related items increases. Statistics on the homogeneity test of the motivation are shown in Table 4 above.

Table 4 shows that the two groups' mean scores of motivation were compared and tested to see if there is a statistically significant difference between the two means using independent group's t-test. The independent variable is the Audio-visual group compared with the Audio group, and the dependent variable is the scores on motivation. The null hypothesis states that the Audio-visual group does not differ from the Audio group in terms of motivation among students (H_0 : Mean of Audio-visual group = Mean of Audio group). The number of samples in the Audio-visual group is 33, and in the Audio group 32. The F-ratio ($F=2.06$ is obtained with 31 and 32 degrees of freedom. Since the probability of the F-ratio is smaller than the .05 confidence level of the critical value ($\Pr [F > 2.06] = 0.0463$), the null hypothesis (H_0 : variances are equal) is rejected. Therefore, the t-test under the unequal variances in Table 4 is used for calculation ($t=0.6770$ with 55.2 degrees of freedom). Since the probability of the t-value is larger than the .05 confidence level of the critical value ($\Pr [| t | > 0.6770] = 0.5012$), the null hypothesis (H_0 : Mean of Audio-visual group = Mean of Audio group) is not rejected, which means that there is a homogeneity between these two groups in terms of motivation. Thus, the homogeneity between the two groups once obtained by the pretest (the JACET test) as shown by the above was confirmed.

Based on the confirmed homogeneity among the two groups, the

effectiveness in the use of audio tapes and videos in the English classroom was first investigated according to the gain in scores. Then, a study was conducted to see whether there was a statistical difference in the gains between the two groups. Finally, the effect of the different media on the students of different proficiency levels was investigated.

In the final analysis, the students were divided into three different proficiency levels according to their performance on the pretest. The criteria of the division was based on the distribution of means: the subjects with the gains more than +1 standard deviation fall in the top-level; ones less than -1 standard deviation fall in the low-level; and ones between +1 and -1 standard deviations fall in the medium-level. However, due to the small sample in this study the students were divided into two groups: an advanced group who earned scores of 50% or above on the pretest, and the less-advanced group who earned scores of less than 50% on the pretest (see Table 5).

Table 5. Levels According to the Results of the Pretest.

Group	Low	Medium	Top
(Three levels)			
Audio-Visual	$X < (\text{or} =) 2 (n=3)$	$2 < X < 20 (n=13)$	$X > (\text{or} =) 20 (n=17)$
Audio	$X < (\text{or} =) 2 (n=4)$	$2 < X < 20 (n=17)$	$X > (\text{or} =) 20 (n=11)$
	Less-advanced		Advanced
(Two levels)			
Audio-Visual	$X < 20 (n=16)$		$X > (\text{or} =) 20 (n=17)$
Audio	$X < 20 (n=21)$		$X > (\text{or} =) 20 (n=11)$

X : The pretest score earned by each subject.

V. RESULTS

For the statistical analysis, the SAS package of statistical programs on Otaru University of Commerce's Fujitsu M-760/6 computer was used.⁴ Table 6 shows the results of the statistical analysis investigating whether there was a significant effect in using audio and audio-visual media in the English classes.

Table 6 compares the gains for each group. Both the Audio-visual group and the Audio group were tested using the t-test to see whether a statistically significant improvement occurred with the treatment. The null hypothesis states that there is no gain among the students in a group or groups by using the audio tape or video ($H_0 : \text{gain} = 0$). The number of samples in the Audio-visual group is 30, and in the Audio group 28. These numbers are different from the number shown in Table 1 because three students in the Audio-visual group and four in the Audio group did not participate in the pretest. The SAS computer program cannot read these numbers.

According to the result of the t-test, the probability of the t-values for each group ($t = 4.06$ for Audio-visual group ; $t = 5.15$ for Audio group) and both groups ($t = 6.41$) are larger than the .01 confidence level of the critical value ($\text{Pr} [|t| > 4.06] = 0.0003$, $\text{Pr} [|t| > 5.15] = 0.0001$, $\text{Pr} [|t| > 6.41] = 0.0001$), so that the null hypothesis ($H_0 : \text{gain} = 0$) was rejected.

⁴ The author is grateful to Professor Wakabayashi Nobuo, head of the Information Processing Center of Otaru University of Commerce and its staff for assisting the author in the use of the SAS package of statistical programs on the computer.

Therefore, there was a significant effect on the gains in both groups according to the results of the t-test. A significant gain was also found among each group (see Table 6). This means that both groups improved significantly in their listening comprehension abilities.

Next, the t-test was utilized to see whether there was a significant difference in the effects between the two groups in terms of the gains. The test was performed by comparing the two means of the groups' gains as shown in Table 7.

Table 7 shows that the two groups' mean gains in scores were compared and tested using independent group's t-test to see whether there was any statistically significant difference between the two means.

In Table 7, the independent variable is the Audio-visual group compared with the Audio group, and the dependent variable is represented by gains in scores. The null hypothesis states that the Audio-visual group does not differ from the Audio group in terms of the gains (H_0 : Mean of Audio-visual group = Mean of Audio group). The number of samples in the Audio-visual group is 30, and in the Audio group 28.

The null hypothesis states that the variances of both groups are

Table 6. T-test for the Effectiveness in the Use of the Media.

Variable : Gain								
Group	N	Mean	STD DEV	STD Error	Mini- mum	Maxi- mum	T	Prob> T
Audio-Visual	30	2.93	3.96	0.72	-6.00	13.00	4.06**	0.0003
Audio	28	5.29	5.44	1.03	-6.00	15.00	5.15**	0.0001
Both groups	58	4.07	4.83	0.63	-6.00	15.00	6.41**	0.0001

** Prob < .001, For H_0 : gain = 0

Note: The values are rounded off to the nearest hundredth.

equal (H_0 : variances are equal). It was tested using the F-test, and as a result, the F-ratio ($F=1.89$) is obtained with 27 and 29 degrees of freedom. Since the probability of the F-ratio is larger than the .05 confidence level of the critical value ($\text{Pr} [F > 1.89] = 0.0965$), the null hypothesis is not rejected. This means that the difference of the two variances is not statistically significant. Therefore, the t-test under the equal variances in Table 7 is appropriate to be chosen for the calculation ($t = -1.8936$ with 56 degrees of freedom). Since the probability of the t-value is larger than the .05 confidence level of the critical value ($\text{Pr} [|t| > 1.8936] = 0.0634$), the null hypothesis (H_0 : Mean of Audio-visual group = Mean of Audio group) is not rejected. Consequently, there is no statistically significant difference between the two groups in terms of the gains.

The t-value of the t-test in Table 7 did not reach the critical value at the .05 confidence level but shows that the effectiveness in the use of the media in the two groups is different in the mean gain in scores with

Table 7. T-test of Two groups Compared in the Effectiveness.

Variable : Gain						
Group	N	Mean	STD DEV	STD Error	Minimum	Maximum
Audio-Visual	30	2.93	3.96	0.72	-6.00	13.00
Audio	28	5.29	5.44	1.03	-6.00	15.00
Variances	T	DF	Prob > T			
Unequal	-1.8733	49.1	0.0670			
Equal	-1.8936	56.0	0.0634			
For H_0 : variances are equal, $F = 1.89$ with 27 and 29 df						
Prob > F = 0.0965						

Note : The values are rounded off to the nearest hundredth.

.0634 probability of error. The mean gained by the Audio group is 5.28, which is almost twice as much as that gained by the Audio-visual group. This means that the audio group improved its listening comprehension abilities more than the Audio-visual group.

Finally, the subjects were divided into two levels according to the results of the pretest : an advanced level and a less-advanced level (see Table 5) ; the t-test was performed on each level. The results are shown in Tables 8 and 9.

Table 8 shows that at the advanced level defined above (see Table 5), the two groups' mean gains in scores were compared and tested to see whether there is a statistically significant difference between the two means using the independent group's t-test.

In Table 8, the independent variable is the Audio-visual group compared with the Audio group, and the dependent variable is represented by gains. The null hypothesis states that the Audio-visual group does not differ from the Audio group in terms of the gains in scores (H_0 : Mean of Audio-visual group = Mean of Audio group). The number of samples in the Audio-visual group is 17, and in the Audio group 11.

The null hypothesis states that the variances of both groups are equal (H_0 : variances are equal). It was tested using the F-test, and as a result, the F-ratio ($F=1.12$) is obtained with 10 and 16 degrees of freedom. Since the probability of the F-ratio is larger than the .05 confidence level of the critical value ($\text{Pr} [F>1.12]=0.8148$), the null hypothesis is not rejected. This means that the difference between the two variances is insignificant. Therefore, the t-test under the equal variances in Table 8 is appropriate to be chosen for the calculation ($t=-0.2546$ with 26 degrees of freedom). Since the probability of the t-value is larger than the .05 confidence level of the critical value ($\text{Pr} [| t | >$

Table 8. Results of t-test at Advanced Level (Pretest = or > 20).

Variable : Gain						
Group	N	Mean	STD DEV	STD Error	Minimum	Maximum
Audio-Visual	17	2.82	4.46	1.08	-6.00	13.00
Audio	11	3.27	4.71	1.42	-4.00	11.00
Variances	T	DF	Prob > T			
Unequal	-0.2515	20.6	0.8039			
Equal	-0.2546	26.0	0.8011			
For H0 : variances are equal, F = 1.12 with 10 and 16 df						
Prob > F = 0.8148						

Note : The values are rounded off to the nearest hundredth.

0.2546] = 0.8011), the null hypothesis (H0 : Mean of Audio-visual group = Mean of Audio group) is not rejected. Consequently, there is no statistically significant difference between the two groups in terms of the gains in scores at the advanced level.

Table 9 shows that at the less-advanced level defined above (see Table 5), the two groups' mean gains in scores were compared and tested using the independent group's t-test to see whether there is a statistically significant difference between the two means.

The independent variable in Table 9 is the Audio-visual group compared with the Audio group, and the dependent Variable is represented by gains. The null hypothesis states that the Audio-visual group does not differ from the Audio group in terms of the gains in scores (H0 : Mean of Audio-visual group = Mean of Audio group). The number of samples in the Audio-visual group is 13, and in the Audio group 17.

The null hypothesis states that the variances of both groups are equal (H0 : variances are equal). It was tested using the F-test, and as

Table 9. Results of t-test at Less-Advanced Level(Pretest < 20).

Variable : Gain						
Group	N	Mean	STD DEV	STD Error	Minimum	Maximum
Audio-Visual	13	3.08	3.35	0.93	-3.00	9.00
Audio	17	6.59	5.60	1.36	-6.00	15.00
Variances	T	DF	Prob > T			
Unequal	-2.1326	26.7	0.0423			
Equal	-1.9980	28.0	0.0555			
For H0 : variances are equal, F = 2.79 with 16 and 12 df						
Prob > F = 0.0780						

Note : The values are rounded off to the nearest hundredth.

a result, the F-ratio ($F=2.79$) is obtained with 16 and 12 degrees of freedom. Since the probability of the F-ratio is larger than the .05 confidence level of the critical value ($\Pr [F > 2.79] = 0.0780$), the null hypothesis is not rejected. This means that the difference of the two variances is insignificant. Therefore, the t-test under the equal variances in Table 9 is appropriate to be chosen for the calculation ($t = -1.9980$ with 28 degrees of freedom). Since the probability of the t-value is larger than the .05 confidence level of the critical value ($\Pr [|t| > 1.9980] = 0.0555$), the null hypothesis (H_0 : Mean of Audio-visual group = Mean of Audio group) is not rejected. Consequently, there is no statistically significant difference between the two groups in terms of the gains in scores at the less-advanced level.

The t-value of the t-test in Table 9 did not reach the critical value at the .05 confidence level but shows that the effectiveness in the use of the media in the two groups is different in the mean gain in scores with .0555 probability of error. The mean gained by the Audio group is 6.59,

which is more than twice as much as that gained by the Audio-visual group. This means that the Audio group at the less-advanced level has improved its listening comprehension abilities comparatively more than the Audio-visual group.

The tests show that the gains in scores by students at both levels did not indicate any statistically significant difference between the two groups, but we can recognize that the t-value for the less-advanced level students almost reaches a 5% level of significance.

VI. DISCUSSION

The first hypothesis which states that students' listening comprehension skills would improve using audio-visual media has been supported by the results (see Table 6). There was a statistically significant effect on the gains in scores in both the Audio-visual group who used the video in the class and the Audio group who used the cassette tapes in the class. Therefore, it can be said that these classes were successful in terms of enhancing students' communication skills.

Another factor explains why these groups improved their listening comprehension skills this much. The medium of language instruction in both classes was English. As Krashen and Terrell (1983) and others advocate, the teacher should use the target language (i.e., language students are learning) and fill the role of a facilitator to increase comprehensible input in order to assure language acquisition in the classroom. As mentioned before, the Japanese Ministry of Education advocates improving students' communication skills such as listening comprehension and speaking skills. If we set one of the goals for teaching English as communication in schools including universities, using audio-visual media is one of the best ways to teach English as a foreign language in

Japan.

The second hypothesis which states that the use of a video medium would be more effective in listening comprehension than the use of only a cassette tape has not been supported by the results (see Table 7). The results show that using cassette tapes only was more effective than using videos in listening comprehension though the results of the t-test did not show a statistical significance. This could perhaps be explained by some of the disadvantages of videos discussed in the review of literature.

As Lonergan (1984) states, visually entertainment inhibited the students' consciousness in listening comprehension. Therefore, when students watched the video, they paid attention only to the scenes on the video and did not listen to the dialogues. On the other hand, in the Audio group, students spent much more time listening to the cassette tape than the Audio-visual group did. The actual time students spent in listening comprehension must have been different in each group. This could cause the gains in scores of the Audio group to be almost twice as much as the Audio-visual group.

Since the visual is synthetic and instantaneous as Visscher (1990) states, time for questions and answers was consumed by display questions which are not so cognitively demanding and do not match the students' needs. Once students understand the situations and get the message from the scene, there are no more information gaps between the video and the students' understanding. This causes students to lose interest in listening to the language since the contents are already known to them. On the other hand, listening comprehension when using a cassette tape is much more cognitively demanding and context-reduced than viewing the situations and other non-verbal cues for comprehension. Students must listen to the language carefully in order to get full meaning of the context.

This can greatly affect the results of this study.

The speed of the dialogues was different between the video material (139 words per minute) and the audio material (116 words per minute). This difference might also affect the results in this research. However, the materials used in this study were, according to their authors, produced in a normal speech. In addition, there was no attempt to control for Japanese student use.

The third hypothesis which states that the use of a video medium on listening comprehension in the less-advanced levels of language proficiency would be more effective than the use of only a cassette tape has not been supported by the results (see Table 9). On the contrary, the results show in listening comprehension that using a cassette-tape-only was more effective than using a video though the t-test results did not show a statistical significance at the .05 confidence level. This also could be explained by some of the disadvantages of video use cited above in the discussion of the second hypothesis. The situational contexts provided by the video as an aid for comprehensible input is important at the beginning level, but a more important thing for language acquisition in the classroom seems the creation of information gaps for which students need to negotiate for meaning (Richard-Amato, 1988).

Listening to the cassette tapes instead of viewing the video is cognitively demanding (Cummins, 1983) if the students are not familiar with the listening activities without reading the textbook. It is well known among teachers that Japanese students are oriented towards written language throughout their English education. Therefore, they are not used to listening comprehension without reading the text. These difficulties create the necessary information gaps for students to negotiate for meaning. This is another plausible explanation why the results of

the gains in scores by the Audio group was more than twice as much as those by the Audio-visual group (see Table 9).

The fourth hypothesis which states that there would be no difference in the effectiveness between the use of cassette tapes and the use of videos in the advanced level of language proficiency has been supported by the results (see Table 8). One plausible explanation is that since their language proficiency is already high, the students gained high scores on the pretest and maintained these high scores on the post test as well. This seems to be why the results show no difference between the two groups.

The fifth hypothesis which concerns the higher motivation with video use has not been supported by the results (see Table 4). The motivation defined in this study is based on the following characteristics: students' preference for English language, their perception of the needs of English at present as well as in the future, their degree of interest in the content of the material used in the classes, and their declared percentage of attendance.

Though many researchers (Edasawa et al., 1989, 1990; Takai, 1984; Forsdale and Dykstra, 1963) identified motivation as an advantage of using the video medium, students seem to find cassette tapes equally motivating. The impact of the students' initial interests in the video may have been enormous as Forsdale and Dykstra (1963) suggested, but the students' focus was the natural flow of the dialogues in the soundtracks in both the Audio and the Audio-visual groups.

To take an example, Takai (1984) discussed the advantage of using video in motivating students to learn English by using frequency data from the language laboratory: How many times did students use the VTR (video tape recorder) in the English class and outside in one aca-

ademic year? He reported more than 60% of the total number of students who came into the language laboratory used the VTR (Takai, 1984, p. 115). However, this number included the number of students who came to view movies dubbed into Japanese or subtitled in Japanese. These students are interested in the film's entertaining value. As some researchers (Visscher, 1990 ; Lonergan, 1984) state, pedagogical effects cannot be expected out of these factors, and such viewing should be distinguished from motivation for language purposes.

VII. SUMMARY AND CONCLUSIONS

Looking at the recent trends in English language teaching in Japan, communication skills are stressed at every level of English education from junior high school to university. Using the audio-visual medium in the English classroom has become an important topic among teachers and researchers in every recent language conference. This can be attributed to the recent rapid developments in educational technology. However, appropriate methodology for its use in the language classroom are far behind due to a lack of sound, scientific studies on its effectiveness.

In this comparative study of effectiveness of the audio-visual and the audio media, two groups of students who had just graduated from high school with approximately the same language proficiency and motivation spent one academic year under the same teacher using two different textbooks : one using a video as an audio-visual medium ; and the other using cassette tapes as an audio medium. The results of listening comprehension tests showed considerable improvements in using both the audio and audio-visual media in the language classroom. However, there may be another important factor : using English in the class. This must

have contributed to the students' improved listening comprehension skills.

Considering the results of this comparative study of the two media, the more times the students spent on the listening activity (in this case, using the cassette tape only), the more they improved their listening comprehension. The pictures on the screen may make it easier for students to understand the language, but once they understand the contents of the video, there is no need for students to pay so much serious attention to the sounds of the dialogues. The instructor in the Audio-visual group may also tend to misunderstand that the students comprehend the contents through listening activities such as checking their comprehension by asking questions, but actually the students may already know the answers from the visual context by the time they listen to the soundtrack. As Krashen's 'i + 1' concept (Krashen and Terrell, 1983) suggests,⁵ adequate tension and some cognitive demands are indispensable ingredients in learning activities for the purpose of enhancing students' listening comprehension.

Though there are many scholars and researchers who state that the video medium highly motivates students in the language classroom, this study found that there was no difference between the two groups (Audio-visual and Audio group) in motivation in terms of students' preference to English, their perception of their needs at present and in the future, their degree of interest in the content of the materials, and their attendance. It is commonly known that video can initially capture the attention of the students, but the question is whether this is the same motivation students need for language learning. It seems that the nature of this motivation

⁵ According to Krashen's Input Hypothesis, optimal input of language is a little beyond the students' current level of the language proficiency.

is different from the motivation which this study investigated : the former is non-pedagogical, and the latter is pedagogical.

VIII. IMPLICATIONS

If the goal of language learning and teaching is acquisition of language and its communication skills, how can we teachers change students' behavior of paying attention only to grammar constrained by the grammar-translation method to more communicative class activities ? As a result of this study, the author would like to recommend the following as pedagogical implications.

1. Where communication is the goal of teaching English in either high school or university, instructors should use English for the class activities supported by either videos or cassette tapes.
2. Motivate students with a video even though the motivation at this point has more entertainment than pedagogical value. The visual effect is a powerful stimulus initially.
3. Create activities which require language use. For example, use information gaps⁶ in activities in order to increase cognitive demands on the students.
4. Distinguish between visual and audio activities : if expecting better listening comprehension, concentrate on listening activities using cassette tapes.

This study indicated that students were equally motivated in learning language by the video and the audio. The most important implica-

⁶ Information gaps "can be created in which one student has information that another does not have but needs" (Richard-Amato, 1988, p. 78). Teacher can create information gaps by using the video and the audio media.

tion of this study was that when listening comprehension is the objective, the audio cassette tape is recommended over the video.

IX. LIMITATIONS

There are several limitations in this study. First, the number of students was too small to generalize the results of this study, and more data should be investigated in the future.

Second, the period of this study, one academic year, is not long enough to make any broad conclusions on the effectiveness of these media on students' language proficiency. We cannot conclude the effectiveness of any teaching method unless we evaluate the results over a longer period of time.

Third, the speed of the cassette dialogs is different from that of the video : 116 words per minutes and 139 words per minute, respectively. This may have influenced the results of the statistical analysis.

Fourth, textbooks used in this study are different in each group : *A Task-Based Listening Course : Listen For It* for the Audio group, and *Your Life In Your Hands : a video course for high beginners, student's book I* for the Audio-Visual group. This may also influence the results of the statistical analysis.

Though there are some shortcomings in this study, it is believed that it sheds light on the questions as to whether the use of audio and audio-visual materials are effective as a teaching method for listening comprehension in the language class. There are, however, some other linguistic areas other than listening comprehension whose development can be aided by using the audio-visual media. The study of these areas will have to wait for future research.

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