THE EFFECTS OF VISUAL FORMAT AND MODE OF PRESENTATION ON NONNATIVE SPEAKER COMPREHENSION OF VERBAL INFORMATION

By

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ABSTRACT

The purpose of this study was to gather data on nonnative speakers' comprehension of spoken language presented via the audio mode (sound only) or the video mode (sound + picture). More specifically, the research examined the effects of three visual formats (or picture content)—contained in the video channel—on comprehension of verbal information carried in the audio channel of broadcast news stories. The three visual formats under investigation were: (1) high redundancy (HR): voice-over-film with similar verbal and visual content; (2) low redundancy (LR): voice-over-film with dissimilar verbal and visual content, and (3) talking head: newscaster only presentation, without film. A smaller follow-up study examined the effect of visuals with a group of subjects of higher second-language proficiency.

The procedure utilized a between-and-within-subjects design and nine news stories videotaped from CBC television, categorized according to visual format. Stimulus news stories were presented to subjects via either the video or audio mode. After each story, actual comprehension of verbal information was measured using a test of cued-recall and perceived
language comprehension was measured using a self-reporting question. In the video mode, subjects were also asked to rate the difficulty of each story.

The results of an analysis of variance indicated that, under the conditions of the present study, subjects scored significantly higher on a test of cued recall when news stories were presented via the video mode. Significant differences were also found between language comprehension scores for each of the visual formats. Highest scores were obtained for the HR stories, and lowest scores for the TH stories. From the results of the follow-up study, it appears the comprehension-facilitating effect of visuals is not as strong for subjects of higher proficiency.

Results are discussed in light of literature on media and learning, the relationship between aural and visual channels, visual format effects and television news, listening comprehension, and visual information processing. Implications and suggestions for further study are presented.
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CHAPTER ONE

INTRODUCTION AND DELINEATION OF THE PROBLEM

1.1 Introduction to the problem

Of recent interest in the field of second language learning is the use of video recordings as a way of giving learners access to the visual element in communicative discourse. Being able to see the setting and the speaker helps nonnative speakers (NNSs) "interpret clues effectively," which in turn "helps comprehension and retention and enhances interaction, which leads to better communication" (Willis, 1983, p.30).

Numerous articles have been published on the use of video in the second-language (SL) classroom; many of them refer to the use of commercially produced television programs for showing language in context. MacKnight (1983), in a review of the literature, found that teachers liked television programs because they bring real life into the classroom, contextualize language, and let students experience authentic language.

Although there is no shortage of literature on possible ways to use video in teaching language, most of the studies take the form of testimonials or generalized observations. There has been practically no recorded
research into the suitability and effectiveness of video for language learning.

Despite the paucity of empirical data, some researchers claim that video is "widely recognized as a viable and effective medium for SL instruction" (Silva, 1983, p.132).

Others recognize the dearth of research, but still promote the use of video. Gillespie (1985), in the introduction to a book of articles on video and language teaching, tells readers: "What is lacking in this issue are any research reports", and adds, "that video 'works' in language learning and teaching seems true by acclamation of those who have used it in thoughtful ways" (p. 2).

Yet others, such as MacWilliam (1986) question claims about the effectiveness of video as a source of language input. MacWilliam raised the question: does the visual element of video introduce any additional factors, apart from linguistic, which may inhibit its usefulness as a teaching aid?

Still others questions the use of videotape instead of audiotape. In a discussion of whether teachers should use videotape or audiotape in teaching listening comprehension, Willis (1983) warns that "the visual element may distract students' attention from the observation of language" (p. 19).
These statements serve to point out that the critical issue of how the visual content of a video recording affects comprehension of its linguistic content has still to be investigated. The question of whether visual format (or picture content) enhances or inhibits comprehension and retention of language has yet to be resolved on the basis of any empirical data.

The purpose of this research was to determine the effectiveness of video as a language teaching aid by obtaining empirical data on NNS speaker comprehension and retention of verbal information presented via audiotape or videotape. More specifically, the study examined the effect of three types of visual formats—contained in the video channel—on comprehension of information carried in the audioverbal channel of television news stories. Of particular interest was the degree of correspondence between information presented simultaneously through the aural and visual channels and the resulting effects on comprehension. A smaller, follow-up study examined the effect of visuals with a group of subjects of higher SL proficiency.

The three visual formats under investigation were: (1) high redundancy (HR): voice-over-film with high correspondence between verbal and visual content, (2) low redundancy (LR): voice-over-film with low correspondence between verbal and visual content and (3)
The research problem is one of determining the effects of mode of presentation, visual format and language proficiency on comprehension of verbal information carried in the audio channel of a sequence of television news stories, with a view to discovering which mode and format best facilitate language comprehension.

A study of the effects of video on language learning brings together research from several areas, including audiovisual communication, educational broadcasting and communication studies, educational and cognitive psychology, and listening comprehension.

The main concern in this study is the effect of visual format on language comprehension, under two presentation modes—audio and video. Therefore, research on audiovisual communication of information should enhance understanding of the present study. As has already been noted, numerous articles have been written on ways to use video in the classroom; many of these refer to the use of commercially produced television programs for showing language in context. But few second-language researchers have studied the effectiveness of the medium for language learning. Fortunately, the use of video and television for
educational purposes has not been restricted to the language classroom.

Relevant research findings from educational broadcasting and communication studies shed some light on the effects of media on learning and, more specifically, the effects of visual format on language comprehension.

That most of these studies derive from first-language contexts should not lessen their importance to second-language learning, for this present study is mainly concerned with the use of authentic video material, for the most part, recorded television, rather than with video materials especially made for language-teaching purposes.

A study of how visuals affect language comprehension also touches on the area of visual information processing, drawing on research from the fields of educational and cognitive psychology.

The language skill most often used by television viewers is listening. Therefore, a study of video use by second language learners is also concerned with theories of listening comprehension and language acquisition.
1.2 Background of the problem

This section looks more closely at some of the areas of research which provide background information and enhance understanding of the present study.

1.2.1 Video and comprehensibility: second language studies

Among the broad claims made on behalf of video is its ability to increase retention of material and, by giving visual support, aid comprehension of spoken discourse (Willis, 1983), making the medium a valuable source of language input.

Central to any consideration of language input is the notion of comprehensibility. As Krashen and other researchers have used the term, comprehensibility of input depends on various language-based criteria. Krashen emphasizes that for language acquisition to occur, learners must be exposed to comprehensible input at the i+1 level, where i is the current level of the learner's comprehension of the language and 1 is one step higher. He recommends the use of video recordings, especially at the intermediate and advanced levels, as good sources for acquisitional input. "The advantage of videotaped materials is that visual and contextual clues are present to support comprehension" (Krashen et.al., 1984, p.268). Other researchers point out, however, that
the visual and contextual clues don't necessarily support comprehension.

In the sense that MacWilliam (1986) has used the term, comprehensibility is also seen to depend on non-linguistic, i.e., extralinguistic information. MacWilliam, after reviewing first-language literature on the use of video for educational purposes, suggested language teachers re-examine the use of certain types of video materials, especially those deriving from off-air sources. The interrelationship between the audio and video channels, between the aural and visual elements (Riley, 1981; Willis, 1983; Fisher, 1984) may create a situation where information in the visual conflicts with the verbal message, resulting in "a lot of viewing and a little comprehension at a linguistic level" (MacWilliam, 1986, p. 133).

Fisher (1984), like MacWilliam, argues that consideration be given to characteristics of the video medium which may militate against effective language learning. She emphasizes that further research is needed to determine whether language development is promoted by television.
1.2.3 Effects of visuals on native speaker language comprehension

The actual focus of this study, the effect of visuals on NNS' language comprehension, has received almost no mention in the second-language literature but has been studied in a first-language context. Relevant evidence from communication studies and television news research indicates that video does indeed introduce factors which may limit its usefulness in the second language classroom.

The literature shows that comprehension and recall of verbal information may be significantly affected by several presentation factors, including the mode of presentation (audio or video), visual format, and degree of correspondence between information presented simultaneously through the aural and visual channels.

Experiments on comprehension across different media have been primarily concerned with one question: Does comprehension and recall of verbal information vary according to the mode of presentation? (Barrow, 1959; Hartman, 1961; Nasser & McEwan, 1976; Hayes et al. 1986). Results have varied, with the majority of studies finding greater recall in the audiovisual mode. These researchers used various combinations of communication modes in a variety of research designs and subjects of
various ages to compare the effectiveness of media for presenting verbal information.

Studies of news recall by children, adolescents and adults revealed greater recall when material is presented in a television format than in radio (Greenfield & Beagle-Roos, 1988). These findings also appear to support Salomon's (1979) theoretical assumptions that television can be easier to understand than non-visual media.

Chu and Schramm (1967), in a review of educational media research, concluded that use of visuals will improve learning from audiovisual messages where it contributes to the information contained in the audio-track; otherwise, visual images may cause distraction and interfere with learning.

More recently, Fisher (1984) has found that younger children (less competent language users) sometimes find conflict between information presented in the audio and video channels of television: "Where a choice must be made, children choose to ignore the linguistic mode and concentrate on the visual" (p. 88).
1.2.4 Audio-video redundancy and television news research

The impact of visuals has long been of interest to television news researchers, who rely on pictures to provide context for stories. Studies of the effect of visuals on learning from television news have produced mixed results, prompting some researchers to conclude that it is not only the presence of pictorial content which is important to recall of news, but the nature of that content (Gunter, 1979). Gunter found that free recall of brief new items was influenced significantly by a visual presentation format. More specifically, he found that news items accompanied by film clips were recalled significantly better than still-picture items or talking head items.

The realization that the presence of a visual context per se is not always a sufficient precondition for greater learning prompted news researchers to consider strategies for making news more comprehensible. This led to investigations into how the relationship between the visual and verbal information affects comprehension and recall. A number of studies (Reese, 1984; Drew & Grimes, 1987; Son et al., 1987) have found that learning was greater with redundant visuals and scripts. These findings are supportive of Severin's (1967) cue-summation theory (described in Chapter Two),
which predicts that film not conveying information consistent with the story would be distracting.

The results of these studies from the fields of communication, news research and educational broadcasting make one approach with caution some of the claims made on behalf of video. The findings also indicate the need to obtain empirical evidence to guide use of video in the language classroom. O'Brien (1986), for example, drawing attention to the dearth of information to guide the selection of video materials proposes: "We have to develop criteria for the selection of materials, and for when and how to use video with particular groups of learners" (p. 169). It was with this background and within this context that the present research problem was developed.

1.3 Research problem

The purpose of this study was to determine the effect of visuals contained in a video recording on NNS comprehension of spoken discourse, under two presentation modes: audio (sound only) and video (sound + picture).

More specifically, the study looked at the effect of three visual formats on comprehension of verbal information in the audio channel of a series of television news stories, with particular interest in the degree of correspondence between information presented
simultaneously through the aural and visual channels and the resulting effects on language comprehension. A follow-up study examined the effect of visuals with a group of subjects of higher SL proficiency.

1.4 Research questions

The research addressed the following questions:

1. Is there a difference in the amount of verbal information comprehended (as measured by scores on a cued recall task) when information is presented via each of two modes:

(a) audio mode (sound only, no visuals)
(b) video (sound + visuals)

2. In the video mode, is there a difference in the amount of verbal information comprehended and recalled via each of three visual formats:

(a) talking head (newsreader only, without film)
(b) high redundancy (HR): high degree of correspondence i.e. redundancy between the audio and video channels, between linguistic and visual information.
(c) low redundancy (LR): low degree of correspondence between audio and video channels, between linguistic and visual information.

Moving from measures of cued recall, to reports of perceived comprehension and difficulty:

3 (a). Is there a difference in subjects' perceived comprehension of news stories when information is presented via either the video mode or audio mode?
3 (b). Is there a difference in subjects' perceived difficulty of news stories when information is presented via either the video mode or audio mode?
A smaller, follow-up study examined the effect of visual formats with a group of subjects of higher proficiency. That study addressed the following questions:

4 (a). Does the level of language proficiency affect the amount of verbal information comprehended and recalled under the two presentation modes?

4 (b). Does the level of language proficiency affect the amount of verbal information comprehended and recalled via each of the three visual formats?

1.5 Chapter Summary

In this chapter, an attempt has been made to provide a brief introduction and background information to the present study. The chapter contains a statement of the purpose and the questions addressed by this investigation. Terminology and detailed background are included in chapter two, along with the hypotheses and a rationale for those hypotheses.
CHAPTER TWO
REVIEW OF RELATED LITERATURE

A study of the effect of video on nonnative speaker (NNS) comprehension of spoken language necessarily involves a study of several areas of research. These include research on listening comprehension, studies on comprehension across different media, studies of the effect of visuals on native-speaker comprehension, along with research on video and language learning. Theories of visual information processing are also reviewed.

While numerous articles have been written on ways to use video in the second language classroom, the main focus of this study, the effects of visuals in a video presentation on NNS comprehension of spoken discourse, has received very little mention in second language literature. However, relevant findings from the fields of educational broadcasting, communications studies and educational psychology give some insight into how visuals affect the learning process.

As background information and to enhance understanding of the present study, this chapter contains a review of pertinent previous research, an explanation of terminology, and the hypotheses.
2.1 Listening

2.1.1 The visual element of communication.

In face-to-face interaction, there is a large number of non-verbal, extralinguistic sources of information and meaning. Researchers, in attempting to determine how much of a communicative event is conveyed by various senses, have reached various conclusions about the proportion for the nonverbal element (Knapp, 1978). Birdwhistell (1970), for example, estimates that only about 30 percent of an interaction between two speakers of the same culture is verbal.

A theme common to all of the articles on video and language learning is video's ability to give learners access to the visual (non-verbal) element in communicative discourse.

Willis (1983), Allan (1984) and Riley (1985) are among the few researchers who have examined the role of the visual channel of communication in interaction, as a necessary prerequisite to discussions of the effect of video on language comprehension.

Willis (1983) makes the point that nonnative speakers of any language are likely to rely more heavily on visual clues to support their comprehension than are
native speakers and that "video is an obvious medium for helping students to interpret visual clues effectively" (p.29). According to Willis, teachers should know which visual features of a video can be exploited:

Effective and systematic exploitation of well-suited video sequences could help to sensitize students to vital differences in non-vocal communication, as well as serve as a stimulus for free discussion. (p.36)

Allan (1984), head of the British Council Visual Unit and a designer of video materials, notes that making students aware of the visual, as well as auditory signals used in communication, can help them "overcome their preoccupation with understanding every word and make them more confident of their ability to follow the gist of face to face communication" (p.25).

Riley (1984) discusses viewing comprehension, his term for how the visual element of a communicative event helps listeners predict and comprehend the verbal message. Riley, as well as other second-language researchers (Brown 1977, Geddes 1982, Willis 1983, Allan 1984, Gillespie 1985), believe that learners should be trained to look for visual clues in any communicative situation where comprehension might be difficult. He classifies the visual information that carries meaning into six categories:
1. the deictic function: this function includes the visual, or nonverbal tools used to refer to what is being discussed. In face-to-face interaction, this is usually done visually through body and eye movements that indicate referents.

ii. the interactional function: This refers to how participants in face-to-face discourse handle 'address', the question of who speaks when and to whom. In English, this is regulated mostly through gaze, and also by posture, orientation and gestures.

iii. the modal function: This is the nonverbal behaviour through which the speaker shows his attitude toward what he is actually saying: is he being serious, ironic or sarcastic.

iv. the indexical function: This refers to the many visual signals, such as dress, grooming, skin, facial

v. the linguistic function: This category includes four types of gestures, which help to clarify or substitute for the verbal message. These gestures include emblems, which substitute for the verbal message, illustrators which illustrate the propositional content of the verbal message, enactions which are reveal its illocutionary content, and batons such as rhythm and tempo.
vi. the situational function: This refers to the spatio-temporal setting which accompanies any communicative act, such as how the interactants perceive time.

Riley notes that video has much to contribute to the teaching of comprehension, as it gives instructors and students access to these categories of visual information. For example, instructors can train students to look for meaning carried by the visual component by asking "What are the speaker's attitudes to each other? Do they like each other? How do you know? Allan (1984), in a discussion of the unique properties of video, states that video recordings of interactions "opens up possibilities for the development of comprehension skills which we are only beginning to explore" (p.24).

2.1.2. Listening and the comprehension approach to language acquisition

In recent years, listening comprehension has come to be seen as "a highly complex problem-solving activity (Wipf 1984, p.345). As such, the listener must always be prepared to hear and decode unfamiliar messages, such as those carried in the visual channel.

The ever-increasing interest in listening comprehension and listening skills is evident in the foregoing discussion on the visual component of
communication. Much of this interest is based on theoretical principles which stress the primary role of aural comprehension in first language acquisition.

Listening comprehension plays a central role in the "comprehension approach" to language learning methodology: the approach emphasizes the development of listening and reading as crucial to the achievement of language proficiency (Parks 1986).

Probably the most widely known model of second language acquisition consistent with this approach is Krashen's Monitor Model. Krashen (1981) makes a distinction between language learning, the formal learning of the syntactic rules of a language which usually occurs in a formal learning environment, such as a classroom, and language acquisition, which is the unconscious learning of the language so that it can be used without drawing on a set of conscious rules.

Krashen's theory postulates that comprehension may be "at the heart of the language acquisition process: perhaps we acquire by understanding language that is a 'little beyond' our current level of competence (Krashen, 1981, p.102). Therefore, an important goal of instruction, especially at the beginning stages must be to "provide the correct kind and amount of input" (Krashen, 1984, p.264). In order for the language environment to provide this input, and thereby for
environment to provide this input, and thereby for
language acquisition to occur, the language must:
1. refer to the immediate environment or be provided
with extralinguistic support in the immediate
environment (the 'here and now' principle).
2. be just slightly above the learner's level of
competence.
3. be focused on communication, rather than form.

According to Krashen, intake-rich language
environments can be found in classrooms as well as
informal environments. He recommends the use of video
recordings, especially at the intermediate and advanced
levels, as good sources for acquisitional input. He
writes: "Video recordings of TV broadcasts are
especially helpful in broadening the students'
receptive skills to areas not normally encountered in
the classroom," and adds, "The advantage of videotaped
materials is that visual and contextual clues are
present to support comprehension" (Krashen et.al.,
1984, p.268).

Byrnes (1984) also affords a central position to
the role of listening in language acquisition:
"Comprehension is important not only because it precedes
production logically and chronologically, but primarily
because it appears to be the basic mechanism through
which the rules of language are internalized (Byrnes, p. 319).

The goal of this section is not to argue that a comprehension approach is a preferred model of second language acquisition. Instead, the aim is to emphasize pedagogical implications of the comprehension approach. If comprehension precedes acquisition, it can be assumed that listening activities should be incorporated at all levels of instruction.

2.1.3 Listening comprehension: Processes

The literature on listening shows a divergence in views about how information is processed, a divergence stemming from different theoretical assumptions about how listeners derive meaning from a string of language signs.

"Bottom-up" information processing involves decoding incoming utterances or messages; a listener decides what a sentence means on the basis of linguistic evidence only, by breaking the surface structure of an utterance into underlying propositions. (Richards, 1986). In contrast, top-down processing doesn't simply rely on linguistic evidence to decode utterances. In addition, the listener has to use previous knowledge and information (also known as "scripts"), which is not transmitted in the
message, and use this information to help interpret the message. According to Weissenrieder (1987),

The ability to bring previously acquired knowledge to listening tasks equips natives with anticipatorial and reconstructive skills. More than a mere passive receptor of language signals, the listener prepares the way for and interacts with what he/she hears and thus greatly facilitates the decoding process. (p.23)

According to Richards, second language learners not only lack scripts for what they are hearing; they also have to cope with 'medium factors.' These factors include the form in which utterances are expressed, such as stress patterns and intonation, and also include the hesitations and sentence fragments of all conversation, and the verbal devices which the native speaker recognizes as cohesive devices of spoken discourse.

Brown and Yule's (1983) definition of listening exemplifies a top-down approach. They define the process of understanding what is heard as a process of arriving at a "reasonable interpretation" of what the speaker intended to say.

Brown (1977) defines understanding as a process of predicting and sampling, rather than a "desperate attempt to keep up with the words flashing by" (p.271).

Like Brown, Rivers (1978) points out that a large part of understanding is due to the listeners' ability to predict: listeners construct a message from what they hear according to certain expectations, based on what
they know of the language, their reading of paralinguistic cues, knowledge of cultural context, etc.

Byrnes' (1984) model of listening comprehension involves a top-down approach. Her model is comprised of three interacting variables: raw data, contextual understanding and schema-based understanding. In her model, schema (or script)-based understanding draws on information stored in longterm memory frames or scripts which direct the comprehension process.

Contextual understanding, i.e. visuals, by providing further input, helps the listener to resolve ambiguities and to form hypotheses and draw inferences. For input to become comprehended intake, the meanings conveyed must be embedded in a comprehensible context, "Such meaningfulness can only come about and be upheld in larger units of discourse versus individual sentences" (Byrnes, p.324).

Many researchers who have studied the process involved in listening comprehension emphasize the contribution of background knowledge to understanding discourse (Brown 1977, Ur 1983, Nagle & Sanders 1986). Implications for materials selection and task design quickly become apparent. The more background knowledge which is assumed in a particular discourse, the more difficult that discourse will be for students to comprehend if they don't share that knowledge.
2.1.4 **Teaching listening skills**  

Analysis of how and why native speakers listen has prompted both instructors and researchers to take a closer look at classroom techniques, tasks and materials for listening. Recent literature on listening has focused on:

1. using classroom techniques which develop native listening skills in language learners.
2. using authentic materials for training students in listening comprehension.

Native language listening comprehension seems to result from a complex interplay of linguistic and extralinguistic, contextual information cues (Mueller, 1980). If non-native listeners are to learn to listen like native listeners, as Brown (1977) suggests, they will have to learn to recognize and use these cues.

Brown and Yule (1983) point out that native speakers expect and achieve only a partial understanding of what they hear, "nonetheless we clearly operate with the expectation of a tolerable degree of mutual comprehension" (p.59). They go on to argue that teachers should not expect 100 percent comprehension from students; instead, the native habit of tolerable mutual comprehension should be developed.
One way to encourage a learner to "make a reasonable interpretation even though he has not clearly heard all the information" (Brown, 1977, p.168) is to teach him to recognize auditory and visual signals used by native speakers. Native speakers use auditory clues, such as stressed syllables and vowel length, as well as a knowledge of the language to help them interpret a string of clues. They also use visual clues, ranging from those provided by the setting, the dress and the posture of participants in a conversation, their facial expressions and their eye movements, to muscular movements of jaw, lips and head which mark production of stressed syllables (Ur, 1984).

Video can be a powerful tool in helping students to recognize these signals. Lems (1983) produced a series of videotapes to teach listening comprehension skills, designed to show the difference between spoken English (with redundancy in verbal discourse, emphasis on words, and paralinguistic features) and formal discourse.

Classroom tasks must not only be based on real-life situations; they also have to take into account specific difficulties faced by NNSs in learning to cope with English (Ur, 1984). Some of the main difficulties include: coping with redundancy and noise; understanding unusual accents; predicting, and using visual and aural environmental cues.
Rivers (1978) estimates that English is about 50 percent redundant; however, artificial or nonauthentic language found in many listening materials, often strips language of its redundancy and makes the students' task even more difficult. Danahy (1985) notes that taped television i.e. authentic materials, can be used here: "from the colours, shapes, movements, camera angles, voice and music, L2 learners receive redundant messages and clues to decode the SL" (p. 56).

Porter and Roberts (1981) attribute comprehension problems among ESL students when they encounter real life communicative situations partly to their exposure only to nonauthentic materials. They list many differences between the language of listening materials created for language learners and the language heard outside the classroom.

The language on made-for-classroom tapes is characterized by:
1) exaggerated intonation patterns
2) more verbally explicit than ordinary language
3) overly clear enunciation
4) use of standard English only
5) slow pace
6) lack of sentence fragments
7) lack of vocalizations to show listener attentiveness
viii) lack of references to specific people, places and incidents.

ix) lack of extraneous background noise.

Teachers who have used authentic video i.e. recorded television, to enhance language comprehension, admit that there is little empirical support for its use, yet a survey of the literature shows they all agree that it 'works': "Although we cannot empirically document the specific gains in student learning and motivation, we both acknowledge a strong conviction that live broadcasts made a positive contribution to our class to students' progress in learning English" (Brinton & Gaskill, 1978, p. 410).

Just how effective is video as a tool to enhance comprehension of spoken English. Studies carried out with native speakers on the effect of different media on comprehension and recall of information have some relevance for second language teaching and learning. The studies are summarized in the next section.
2.2 Effects of different media on comprehension and recall

2.2.1 Mode of presentation and learning from media

The battle for supremacy between seeing and hearing has been waged presumably ever since man was endowed with eyes and ears. (Hsia, 1968, p.248)

The human sensory modalities, of which vision and hearing are the most important, correspond to the two media channels--audio and visual.

A rationale frequently cited for the use of audio-visual instruction is that greater learning occurs when material is presented via multiple channels of communication.

Many of the studies on audio-visual learning compare the effectiveness of learning from the audio-visual mode (e.g. television and video) with learning from the audio mode (e.g. radio, audiotapes). Researchers have attempted to answer the question: Does comprehension and recall of information vary according to the mode of presentation? Results have varied, with the majority of studies finding greater recall in the audiovisual mode.

Barrow (1959) found television superior to radio for tests of immediate recall of factual
information. Gradeschool children listened to or watched and listened to a series of news backgrounder programs, and were given a multiple-choice test of information contained in each of four news programs.

In a review of the literature on media channels and learning Hartman (1961) found that comparisons between pictorial-verbal presentations indicate the advantage of multi-channel presentations. However, he warned that results should be viewed with caution because of varied experimental designs and biases against the verbal channel.

Nasser and McEwan (1976) compared recall scores elicited by videotape, audiotape, print alone, and audio plus print. The findings confirmed their hypothesis that videotape would result in higher recall scores, but the difference was not significant.

Hayes et al. (1986) examined the relative effectiveness of television and radio for conveying story information. Young children and adults were presented the same story via either television or radio; subjects then retold the story to an adult. Media differences were found, with children in the radio treatment showing significantly more errors in comprehension and memory than children in the television treatment. Subjects in the radio condition showed greater recall than subjects who watched television, but
the events recalled were not very important to the overall theme. These findings support Salomon's (1979) theoretical assumption that television can be easier to understand than nonvisual media.

Some studies have found that greater learning occurs when information is presented only through the audio channel, without visual representation.

Ortmeyer & Goldstein (1980) investigated the effects of audiovisual media used to increase listening comprehension skills of language learners. It was hypothesized that the audio mode would be more effective than video for learning to listen to and understand English. Their hypothesis was confirmed, but the authors suggest the results be interpreted with caution because recall was tested via print.

2.2.2 Relationship between the aural and visual channels

Some communication researchers have gone beyond simply comparing learning from dual channels with learning from one channel, and looked more closely at the nature of the relationship between the aural and visual channels.

Chu and Schramm (1967), in their review of educational media research, concluded that visuals will improve learning from audiovisual messages only when the visual contributes to the information contained in
the audiotrack; otherwise, visual images may actually cause distraction and interfere with learning.

Hsia (1968) proposed the audiovisual channel has advantages over the audio or visual alone only if the stimuli presented are almost identical, i.e. redundant. "Because of between-channel interference, it is not by any means a rule that the audiovisual is always better than audio or visual only (p. 250)."

More recently, Fisher (1984) has found that younger children (less competent language learners) "find conflict between information presented in the linguistic and visual modes (p. 88)." Where a choice must be made, children choose to ignore the linguistic mode and concentrate on the visual.

The findings of these researchers appear to be in accordance with Severin's (1967) cue-summation theory. The theory hypothesizes that presentation of irrelevant cues in either the visual or audio channels will cause a loss of learning from the other channel, but when additional cues are presented in either channel, greater learning will take place.

Applied to video recordings or television news, this theory predicts that film not conveying information consistent with the story would be distracting.
2.3 Effect of visuals on comprehension and recall

2.3.1 Research on visual format and television news recall

That the presence of a visual context per se is not always a sufficient precondition for improved learning has already been noted. Many of the findings on how the contents of the visual channel affects comprehension of the audio channel have come from experiments carried out by television news researchers, who have been studying ways to increase learning from news for many years.

Research literature presents widely varying estimations of the value of visual material in news reports. Early studies seemed particularly concerned with: (1) questions concerning visual format (e.g. newscaster only or newscaster talking over film) and recall of news, and (2) the effect of presentation mode (audiovisual versus audio mode) on recall. They didn't attempt to examine the degree of correspondence between the audio and visual channels.

Gunter, Berry & Clifford (1982) surveyed the literature on visual format conditions and news recall. They concluded: "There is no unequivocal answer to the question of whether it is always best to use film or stills or no visuals at all in television news productions" (p. 17).
Studies of news recall by children, adolescents and adults reveal greater recall when material is presented in a television format than in radio (Greenfield & Beagles-Roos, 1988). Although differences in recall are not always found, any differences consistently favour television over radio.

Jorgenson (1955, cited in Gunter, 1980) found no significant difference in information gain between news presented by a newscaster alone (talking head) and the newscaster speaking over film.

Katz, Adoni & Parness (1977), studied the extent to which pictures enhanced recall among Israeli respondents and found in one study that radio listeners forgot more bulletin items than television viewers. However, in a second study they found that subjects who saw a television newscast performed no better on tests of news retention than others who had only listened to the same program. It should be noted that these field studies did not adequately control for a number of confounding variables, such as length and number of items contained in news broadcasts and the amount of attention subjects paid to the broadcasts.

Gunter (1979, 1980a) set out to answer the question: Do visuals such as film or still pictures enhance learning from news or do the pictures result in the presentation of irrelevant and distracting visual
output which inhibits information gain? He found that free recall of television news items was significantly influenced by the type of pictures carried in the video channel.

In the 1979 study, immediate free recall was tested of the verbal content of fifteen brief (4-6 seconds long) news items recorded from television. Subjects received the news items either via the video mode (audio + video) or via the audio (soundtrack only) mode; immediately after they wrote down as many items as they could recall. Within the video mode, five items contained film footage, five items contained still pictures, and five showed the newscaster only, without any pictures.

A significant main effect due to mode was found. Recall of news items was higher following presentation in the video mode than in audio. A within-subjects analysis showed a significant effect due to picture content. A series of pairwise comparisons found that items accompanied by film were better recalled than those accompanied by still pictures, and still picture items better recalled than talking head items.

Gunter concluded: "...it is not only the mere presence of pictorial content within the video mode which is important to memorability of news items, but
also the nature of that content, with moving pictures enhancing recall more effectively than stills" (p. 60).

Gunter (1980a) later replicated these findings in a similar experiment. However, the results of another study in the same series (Gunter, 1980b) conflicted with the results of the first two experiments.

In this last study, students viewing a televised news story accompanied by film footage or by a still picture gave fewer correct answers to questions about story content than when they viewed the same items presented by a talking head.

Gunter attributes the discrepancy between this study and the earlier ones to the differences in length of news stories and type of recall measures. In the two earlier studies, subjects viewed very brief (six second) news clips, followed by an immediate test of free recall. In the third experiment, subjects were exposed to one-minute news clips, and recall was tested via a series of multiple-choice questions. Gunter (1980b) suggested that because the news items were longer, and because the multiple-choice questions necessitated processing at a deeper level, "the meaningful relevance of any accompanying picture material to concurrently running verbal information becomes an important factor" (p. 11). Therefore, he added, film that was not entirely
relevant to verbal content of the news items interfered with learning.

Findhal (1981) found pictures and graphics helped subjects recall information from television news stories. Drew and Reese (1984) reported that children who watched a newscast with film performed much better on recall and understanding tests than those who viewed a newscast with only a news anchor reading.

Literature indicates that viewers' ability to divide their attention between the dual audio and visual channels of television depends on a number of variables, including, as Gunter (1980b) suggested, the nature of the stimulus presented. This probably explains why studies of the contribution of visual information to learning from television news have produced mixed results.

2.3.2 Audio-visual redundancy and comprehension of news

The conflicting findings on visual format and news recall prompted some researchers, such as Gunter, to take a closer look at the relationship between picture content and audioverbal content of news items.

As noted elsewhere, Chu and Schramm (1967) found that the use of visuals will improve learning from audiovisual messages where the visual contributes to information carried in the audio track; otherwise visual images may impair comprehension and learning.
In their review of research on visual format and news recall, Gunter, Berry & Clifford (1982) concluded: "An important factor when visual accompaniment is presented is the degree of correspondence between picture material and verbal material" (p.17).

Findahl and Hoijer (1981), by varying the pictorial accompaniment to news items in a news program, showed that recall was best where items were illustrated by pictures which correspond to the verbal information and poorest with no illustrations.

Edwardson, Grooms & Proudlove (1981) compared information gain from news stories shown with interesting video with news stories accompanied by a talking head. Results showed people remember more facts delivered in TV news audio when those facts are accompanied by interesting video rather than by a shot of a talking head, even when the interesting video does not convey those facts. They had predicted that the interesting video would prove distracting, and so result in less information gain from the audio channel. The authors suggest the increased information gain may have occurred because the pictures aroused the subjects' curiosity and interest.

Son, Reese & Davie (1987) examined the effects of visual-verbal redundancy on learning from television news. Five stories showing redundancy between audio and
visual channels were selected; to create nonredundancy, each story’s camera shots were re-edited. After watching the items, subjects were asked to state the central point of the story and given a multiple-choice test. Results showed the high visual-verbal redundancy produced greater recall than the low redundancy.

Drew and Grimes (1987) examined the effects of audio and visual redundancy on recall and story understanding in television news. Five short newscasts were produced, each containing fourteen stories placed in random order. Subjects were randomly assigned to one of three redundancy conditions: high redundancy, medium redundancy or low redundancy. Comprehension was measured by asking multiple-choice questions about central points of the stories.

Results supported the hypothesis that greater redundancy in the newscast would produce higher auditory recall. Scheffe’s post-hoc test showed a significant difference between mean scores for high-redundancy conditions and medium-redundancy conditions. Drew and Grimes concluded: "When watching redundant television news, viewers focused most attention on the audio while still attending to the video. When there is a conflict between the audio and video, however, viewers attend to the video at the expense of the audio." (p. 459)
The results of studies on audio-video redundancy generally seem to support Severin's cue-summation theory. Applied to video and second language learning, the results go some way toward answering a question posed by MacWilliam (1986): Does video, particularly in its authentic form, introduce any additional factors which may in some way inhibit its usefulness as a language-teaching aid? The results also seem to support Willis' (1983) belief that, "depending on the nature and aims of the teaching material, the visual element may distract students' attention from the observation of language" (p. 19).

2.4 Video and language learning

2.4.1. Other factors involved in learning from media

Relevant evidence from studies on television news comprehension indicates that video does indeed introduce factors which limit its usefulness in the second-language classroom. It has been shown that news recall may be significantly affected by several presentation factors, including the mode of presentation, type of visual, and the degree of correspondence between the pictures and the verbal content.

Other researchers have identified additional variables which can have significant effects on learning. These include factors such as background knowledge relating to the content and format of a
program, level of language proficiency and modality preference.

2.4.2 Background Knowledge

As noted earlier, the top-down approach to listening places great importance on the role of background knowledge. The listener doesn't rely only on linguistic evidence to decode utterances; he also has to use previous knowledge and information (also known as scripts or schemas) to help interpret the message. Rouner (1987) points out that "There may be several scripts for the same individual for an activity as mundane as watching news" (p. 71).

Recent findings indicate that prior knowledge contributes both to developmental differences in comprehension of programs and to individual differences within age groups (Collins & Wiens, 1983).

Collins and Wiens (1983) list three categories of knowledge that may affect comprehension of and response to television programs:

1. knowledge about presentation formats.
2. knowledge of media conventions.
3. general social or world knowledge.

Second language students not familiar with the presentation format, or structure, of television newscasts could probably improve their use of
television for learning English if they were made aware that a definite structure exists.

Media's way of structuring and presenting information, that is, their symbol systems (Salomon, 1979), are media's most important attributes:

The better a symbol system conveys the critical features of an idea or event, the more appropriate it is for an act of instruction. (p. 25)

Knowledge of media conventions and symbol systems, e.g., cuts, zooms, closeups, wipes, etc., could also be taught through instruction.

Salomon's (1979) model of learning from media draws heavily on schema theory and on understanding the individual's context of expectations for a particular situation. It focuses on the relationship between three constructs: the perceived demand characteristics of the situation, the individual's perceived self-efficacy for using that particular medium, and the amount of mental effort an individual invests in processing the message. These three constructs explain the amount of learning which will result from media exposure.

2.4.3 Level of language proficiency

Mueller (1980), in a study designed to determine the effect of visuals on listening comprehension, found that contextual visuals enhanced recall for beginning German students. But interestingly, he found that the effects of the visuals seemed inversely related to the
listeners' level of language proficiency: "The visuals do not seem to enhance comprehension, however, if because of more extensive skills the student is able to derive a context from the linguistic cues provided" (p.340).

2.4.4. Modality preference

Sabine (1984) notes that people have different "mental set-ups", or a preference for one media over another. Some people are more audio-minded, and others picture-minded. Krendl (1986), in a review of the literature on media preference and learning, found that students typically tend to like the media activity least from which they learn the most. Salomon and Leigh (1984), however, reported that students preferred the medium they found easiest to use, and the easier it was to use, the more they felt they learned from it.

2.4.5 Television as a source of video materials

Numerous articles have been published on the use of video in the second-language classroom; many of them refer to the use of commercially produced television programs for showing language in context. MacKnight, in a review of the literature, (1983) found that teachers like off-air programs because they bring real life into the classroom, contextualize language naturally and let students experience authentic language in a controlled environment.
However, as several writers have noted (MacWilliam 1986; Selinker 1986; O'Brien, 1986), there has been practically no recorded research into the suitability and effectiveness of video for language learning. Riley (1981) and Willis (1981) have classified how nonverbal and verbal communication systems relate, and how television can be used to emphasize the relationship.

O'Brien's response to MacKnight's recommendation of television: "It is not enough to use television materials on video in classrooms just because they are good television materials: the question we have to answer is whether they make good video materials" (p. 169).

MacWilliam (1986) considered some of the relevant research findings from the fields of educational broadcasting and communication studies which have a bearing on the comprehensibility of video when it is used for language input. After reviewing the literature, he concludes that teachers should "re-examine" their use of certain types of video, especially those recorded from television, such as documentary-style programs in which voiceover commentary is often the major auditory input. "On the other hand, the more convergent audio and visual strands of something like Coronation Street...may prove more supportive to the English language learner" (p.134).
Selinker (1986), like MacWilliam, argues that soap operas are an excellent source of language input, and as such should become an important English language teaching "video genre". He emphasizes the redundancy of information found in soap operas, and the correspondence between the audio and video channels.

Selinker reports on a course which had a section built around in-class use of a television soap opera in "real time." He concludes that soaps in language teaching:

(a) help learners cope with TL (target language) material not only in real time, but in a new specific context; (b) provide learners with a rich and repetitive model of rhetorical and grammatical colloquial English; (c) provide a reasonable role for explicit grammar teaching in terms of precision of meaning and comprehensible output; (d) help teachers "teach around fossilization in particular contexts, thus possibly delaying its onset; (e) provide at least some "internal-IL (interlanguage) transfer for learners across activity types within domains and genres; (f) help learners move from a student IL way of describing events to a more precise TL-like way; (g) aid retention of TL items in memory; and (h) use productively a rich and available media source that many students watch anyway, but have trouble viewing on their own. (p.30)

Although there have been numerous references to the use of video in the classroom, there has been little research on immigrant use and comprehension of broadcast television outside the classroom environment. Kozakiewicz (1987) conducted an exploratory survey of the television-viewing habits of adult students of
English as a second language. Results showed that a large number of students watch English language television, with amounts of viewing seeming to depend on employment status, access to native language television, native language background and prior educational level of respondents. The hypothesis that some programs are more comprehensible than others for second language learners was not supported. Interestingly, few differences were found in the types of programs watched by students at different language levels. News broadcasts, movies and "Three's Company" had the highest number of viewers. Two main factors which appeared to influence respondents choice of programs were access and comprehensibility.

Commenting on the popularity of news broadcasts among respondents, Kozakiewicz notes: "Of the English sources of information available to immigrants, the visual element of television news probably renders it more comprehensible than either newspapers and radio" (p. 153).

Sinclair (1985) found that ESL students at all language levels watched "Three's Company." She questioned students about their choice of program, and attributed its popularity to the context-dependent, explicit language used by the program's characters. Much of the language was also accompanied by illustrative
actions, and convergence between the audio and video channels.

2.5 Visual Information Processing

In general, most broadcast and communication researchers have found that pictures in newscasts do enhance recall, at least when they are appropriate to the spoken text.

What accounts for the superiority of picture items over those without pictures? Paivio (1971) has developed a theoretical framework for understanding picture effects.

Paivio's dual-coding theory, first developed to account for picture effects in verbal learning studies, is based on the assumption that memory and cognition are served by two separate symbolic systems, one specialized for dealing with verbal information and the other for nonverbal information. The verbal representational system corresponds to linguistic events; the non-verbal code corresponds to the visual-spatial images, representative of concrete events and objects, and capable of being aroused by verbal stimuli. The two systems are presumed to be interconnected but can function separately. "Independence implies, among other things, that nonverbal and verbal memory codes, aroused directly by pictures and words or indirectly by imagery
and verbal encoding tasks, should have additive effects on recall" (Paivio & Lambert, 1981, p. 533.).

According to the dual-coding theory, picture items can be stored in terms of two separate codes—a verbal code and a picture code—while items unaccompanied by picture material would normally have only a verbal code.

Thus, since audiovisual presentations are encoded in terms of both their picture content and their verbal content, such presentations can be more readily retrieved from memory than purely verbal presentations (Graber 1987).

"The presence of an additional memory code for picture items would enhance their probability of being recalled because if one code was forgotten or simply not available for retrieval, the other could be utilized instead" (Paivio, 1979, p. 387).

Paivio's theory also postulates that much more informational content can be absorbed rapidly from pictures than is possible from words, since people can process several visual stimuli simultaneously.
Paivio (1986), in a discussion of the implications of the dual-coding theory for second language learning, notes:

The theory leads to a strong emphasis on the role of situational contexts and images in second language learning. In particular, the theory suggests that language learning strategies based on the systematic use of referent objects, picture activities, and mental imagery would be especially effective in promoting learning. (p. 257)

2.6 Hypotheses

2.6.1. Background and rationale for hypotheses

The discussion in this chapter has shown some of the difficulties ESL students may encounter when exposed to authentic video material. It appears that video does indeed introduce factors which may limit its usefulness as a source of language input.

The literature indicates that teachers are using video in the second-language classroom to aid listening comprehension, with little information to guide in the selection of video materials. As was noted, there is a paucity of empirical evidence to back up claims made on behalf of the video medium, and the issue of how the visual element of a video recording affects comprehension has still to be investigated.

The literature shows that comprehension and recall of information may be significantly affected by several factors, including the mode of presentation (audio or
video), visual format, and the degree of correspondence between information presented simultaneously through the aural and visual channels. It also indicates that some subject variables may affect comprehension.

For these reasons, the present study compared NNS comprehension of information from three visual format treatment conditions, presented via either audio (sound only) or video (sound + picture). Salomon's (1979) finding that viewers perceive television as being easier to understand was also tested in this present study; subjects' perceived comprehension was checked, using a self-report measure. In this study, transcripts of post-treatment discussions were analyzed qualitatively to determine the effect of subject variables on comprehension.

2.6.2 Operational statement of hypotheses

Based on the literature, and with the rationale outlined above, the research questions stated in chapter one were operationalized and the following hypotheses were developed.
1. $H_0$: There are no differences between the two presentation modes in terms of information comprehended and recalled, as measured by scores on a cued recall task.

$$\mu_1 - \mu_2 = 0$$

(Where $\mu_1$ is the mean score for mode one and $\mu_2$ is mode two)

$H_1$: There are differences between the two presentation modes in terms of the amount of information comprehended and recalled, as measured by scores on a cued recall task.

$$\mu_1 - \mu_2 \neq 0$$

2. $H_0$: There are no differences among the three visual format treatment conditions in terms of the amount of information comprehended and recalled.

$$\mu_j - \mu_{j'} = 0$$

(Where $\mu_j$ is the mean score for format $j$ and $j'$ is an alternate mode)

$H_1$: There are differences among the three visual format treatment conditions in terms of the amount of information comprehended and recalled.

In the interest of clarity, the remaining hypotheses are stated verbally rather than in mathematical terminology:

3. $H_0$: Within the video mode, comprehension will not be highest among students in the HR treatment condition.

$H_1$: Within the video mode, comprehension will be highest among students in the HR treatment condition.
4. \( H_0 \): Within the video mode, comprehension will not be lowest among subjects in the TH treatment condition.

\( H_1 \): Within the video mode, comprehension will be lowest among subjects in the TH treatment condition.

5. \( H_0 \): Perceived comprehension of news stories will be higher among subjects in the audio mode, as expressed by a self-report measure.

\( H_1 \): Perceived comprehension of news stories will be higher among subjects in the video mode, as expressed by a self-report measure.

6. \( H_0 \): There are no differences among the three visual formats in terms of difficulty ratings assigned by subjects.

\( H_1 \): There are differences among the three visual formats in terms of difficulty ratings assigned by subjects.

The research questions for the smaller, follow-up study were operationalized and the following hypotheses developed for that study.

7. \( H_0 \): There are significant differences between the presentation modes in terms of the amount of information comprehended and recalled.

\( H_1 \): There are no significant differences between the presentation modes in terms of the amount of information comprehended and recalled.

8. \( H_0 \): There are significant differences among the three visual format treatment conditions in terms of the amount of information comprehended and recalled.

\( H_1 \): there are no significant differences among the three visual format treatment conditions.
2.7 **Definition of terms**

The following terms are frequently used in the study and are defined as follows:

**Authentic video.** Authentic video materials include any type of television programs produced for native speakers, and used for teaching English as a second language.

**English as a second language students (ESL students).** These are students for whom English is not a native language and who are enrolled in classes to learn English. ESL students are distinguished from **English as a foreign language students (EFL)** as they are learning English in an environment in which English is the main language of the community.

**Off-air recordings.** These are programs that are taped from television for use in instructional settings.

**Terms associated with television news.**

A number of terms associated with television news are used in this study:

i. **visual format:** refers to the picture content of a news story.

ii. **talking head:** refers to a visual format in which only the newsreader is shown reading a script, unaccompanied by picture materials.
iii. voice-over-film: the announcer's voice is heard over in-the-field news shots.

iv. visual/verbal redundancy: refers to the degree of correspondence between information carried in the audio and video channels. A story in which the audio and video tracks carry the same, or similar information, is referred to as highly redundant; stories with dissimilar audio and video channels have low redundancy.

2.8 Chapter summary

This chapter contains a review of literature related to the present study, definitions of relevant terminology, and statements of the hypotheses which were developed as a result of the literature review. Chapter three contains a description of the subjects and the methodology used in testing the hypotheses.
CHAPTER THREE

METHODOLOGY

The first part of this chapter contains a description of the subjects and the independent and dependent variables of interest in this study. The section on development of experimental materials focuses on the steps involved in preparing stimulus materials for the experimental task. Major topics taken up in the section on procedures include a discussion of the research design, the experimental task, and coding of data for both the main study and a smaller, follow-up study. Finally, procedures used in the data analysis for both the main and follow-up study are outlined.

3.1 Subjects

The subjects involved in the study constituted a random sample drawn from the population of students enrolled in advanced ESL classes at a secondary school. A random sample of the school's entire ESL population was not selected, as the review of the literature revealed the impossibility of using video presentations with lower-level English learners. Second-language learners at the school are placed in beginner, intermediate, advanced, or transitional ESL classes after being tested on all language skills.
The 27 subjects (16 female and 11 male) in the study were all enrolled in Advanced Science and Advanced Drama classes for ESL learners. The students came from a variety of first-language backgrounds, including Cantonese, Spanish, Polish, Vietnamese, Tagalog and Punjabi, and ranged in age from 15 to 19.

3.2 Dependent variables

Three dependent variables were used in this study. The dependent variable of most interest was the amount of verbal information comprehended under three visual format treatment conditions: high redundancy (HR), low redundancy (LR) and talking head (TH). The dependent variable was measured as the score on a test of cued recall of auditory content, administered immediately following presentation of the stimulus material. The stimulus material was a series of television news stories presented via videotape or audiotape. More detail is given in the description of the experimental task.

The second dependent variable, perceived comprehension, was measured using a self-report measure administered following presentation of each news item. The third dependent variable, perceived difficulty, was measured using a self-ranking measure administered at the end of the testing period.
3.3 **Independent variables**

The two independent variables of interest were visual format and mode. Mode involved the auditory only (audio mode) or visual-plus-auditory (video mode) presentation of a sequence of recorded television news stories. Within the video mode, items were categorized into three visual formats, according to the picture content.

3.4 **Design of experimental materials**

The main purpose of this study was to compare the effects of three visual format treatment conditions on NNS comprehension of information carried in the audio-verbal channel of a sequence of television news stories. The visual formats were: (1) newscaster only presentation, without accompanying film; (2) low redundancy (LR), where there is little correspondence between linguistic and visual information, and (3) high redundancy (HR) presentations, where there is high correspondence between linguistic and visual information. The experimental task involved presenting news items, containing one of the visual formats, to subjects via either videotape or audiotape and having them complete a cued recall test of comprehension. The design required two parallel sets of stimulus material, one for the video presentation mode and one for the
audio presentation mode. The actual procedure used is described in greater detail later in this chapter.

As was reported in chapter two, most of the research on the effects of visual format on comprehension has been carried out by television news researchers, interested in finding out which production practices facilitate acquisition and retention of televised information programs. Berry, Gunter & Clifford (1981) report that television news offers a suitable test bed for answering such questions, since it has a standardized and homogeneous form and so "seems likely to yield information on the effects of manipulation of form and content" (p. 172). Therefore, the stimulus stories for this experiment were selected from television news. The construction of the experimental materials involved a number of steps.

First, fifteen hours of newsreader-only stories and voice-over stories were recorded on videotape from television news programs over a two-month period, about three months prior to the experiment. Written permission was obtained from the CBC to use the tapes in this experiment.

Next, nine different news stories were chosen by the experimenter, and categorized as either high-redundancy (HR), low-redundancy (LR), or talking head (TH), according to their picture content, and ranging in
length from 20 seconds to 35 seconds. An independent observer, a specialist in educational films and television, viewed the selected stories without knowledge of which category they had been assigned to; his classification was in agreement with the experimenters.

In one condition (high redundancy) all stories had redundant audio and video. The stories contained voice-over film, with the newsreader out of shot except for a short studio introduction at the beginning of the item. In the second condition (low redundancy), the video and the audio did not match; the film did not convey the same facts as the audio channel. Again, the stories contained voice-over film, with the newsreader shown only at the beginning of the item. Voice-over film was included in both the HR and LR conditions because it represents the situation sometimes found in off-air programs used in teaching ESL. The third condition (talking head) consisted of the newsreader seen in moderate close-up reading the news story. No other visuals were seen in this condition.

Summaries of the news items in the three categories are as follows:
1. High redundancy. (a) Vancouver and Victoria will get new buses. (b) Vancouver Island experiences unusually cold weather. (c) The pope’s weekly audience at the
Vatican is interrupted by a man claiming to be the messiah.

2. Low redundancy. (a) A man is stabbed in a downtown Vancouver restaurant. (b) Firefighters respond to a chemical spill on Cambie Street. (c) Negotiations resume between CBC and its technicians.

3. Talking head. (a) The leader of a political party resigns. (2) Volunteers clean up an oil spill on Long Beach. (3) Three lost hikers are found.

Complete transcripts of the audio content of the stimulus news stories are in Appendix A.

Last, the items were edited into three blocks of three items, with a block containing one item from each of the three visual format conditions. In block one, stories were randomly arranged as follows: HR, LR, TH; block two was arranged with LR, TH, HR. Block three contained a TH, HR, and LR arrangement.

Stories were randomly arranged in blocks of three so that subjects would not be able to recognize a pattern and anticipate placement of the stories, which may have become confounded with visual format effects during recall. This arrangement also allowed for short rest periods during the experimental task. The effect of order of presentation of items was not under investigation in this study.
3.4.1 Apparatus

Video editing was done using the facilities and staff of the Media Services division of the University of British Columbia. The selected news items were edited in the pre-arranged order, with five seconds of black inserted between each news story and ten seconds of black between each block. Within the HR and LR items, sections were re-edited to emphasize high levels of redundancy. The news blocks were edited onto a 1/2 inch VHS master tape.

The editing apparatus consisted of a JVC playback unit (BR 64003), a JVC recorder (BR 8600U) and a JVC editor (BR 86U).

A sound-only recording was required for the audio presentation mode, so the soundtrack was recorded from the videotape, using a Sony broadcast quality (TC 180) tape recorder.

3.5 Procedure

3.5.1 Research design

The design for this study is one in which three kinds of visual formats are presented to subjects via the video mode or audio mode. The study was operationalized in a between-and-within subjects design, with repeated measures. Mode, the between-subjects factor, has two levels: video and audio. Visual format is the within-subjects factor and repeated
measures. Subjects in each level watched/listened to or listened to news stories containing visual formats at one sitting, hence the repeated measures.

Howell (1987) described the repeated measures design as one having an advantage over other experimental designs in that it allows the experimenter to reduce overall variability by using a common subject pool for all treatments.

3.5.2 Experimental task

The students used in the study were randomly assigned to one of the two experimental conditions (audio or video). This was done because there was no reason to suspect any systematic differences among the subjects.

Each group was run separately. The experimenter told subjects she was working on a study involving listening to news. Subjects were further told that a news item would be played to them, and that afterwards they would be asked to answer questions about the story. Questions were answered and subjects were assured that sufficient time would be given for them to write their answers. Appendix B contains an example of the comprehension questions.

In the video mode, each news item was presented and then the television screen faded to black. Following this, an immediate test of comprehension was given. This
took the form of a cued-recall task during which the subjects were required to write down answers to questions about the auditory content of the story on the response sheet provided. All subjects were self-paced during the recall task and continued until such time as their memory of comprehended items was exhausted. This usually happened after about seven to eight minutes.

Questions were designed to cue recall of the information most commonly carried in news reports. These include questions about the five W's: who, what, where, when and why (Mencher, 1981).

At the bottom of each response sheet, subjects were asked to indicate, by placing an X on a scale, the percentage of the story they felt they had understood. Response sheets were collected before the next item was shown. This process was repeated for all nine stories. Subjects were given a five minute rest period between each block of stories.

At the end of the testing period, subjects were given a list of all the stories, and asked to rank them according to how easy or how difficult they were to understand. Stories were ranked from 1 (very difficult) to 10 (very easy). An example of the ranking sheet is included in Appendix C.
Students were then grouped, and asked to use their ranking sheet to discuss: (i) which stories they found easy or difficult to understand, and (ii) why certain stories were easy or difficult to understand. One member of each group had to report back to the whole class on the results of the discussion. The discussions were recorded on audiotape, and the transcripts were later studied as a way of providing a potentially richer interpretation of the data.

The same procedures employed in the video mode were used in the audio presentation.

3.5.3 Testing apparatus

The testing apparatus consisted of a 21 inch Sony colour television monitor coupled with a VHS cassette recorder. A Scotch T30 professional videocassette was used. Contrast, brightness, and audio volume were held constant across all trials.

In the audio condition the stimulus materials were played over a broadcast quality audiotape player. The audiotape used was a BASF LH-MI 90.

3.5.4. Scoring

Subjects were required to answer four general questions on the main points of each story. Three of these questions were based on the information covered in most news broadcasts; for example, what is this story about? where did this story happen? when did this story
happen? The fourth question asked subjects to write any other information they had understood. This question was included to cue recall of comprehended background or additional information, which didn't fit under any of the other three questions.

Initial analysis of the recall response sheets indicated a great range in the quality and depth of responses to questions. Students had been instructed to write down as much as they could remember. Correct answers ranged from a single word to a detailed paragraph. As a result, a coding system was developed to reflect the variation in quality of the answers.

Each correctly answered question was scored from one to three points, depending on the quality of the response. A partial answer scored one point, a complete answer scored two points and a complete answer with additional details scored three. Thus the total possible for each news item was 12 points.

To check the accuracy of the researcher's coding, a random sample of 20 response sheets were selected and given to an independent scorer to code. There was 93.7 correlation between the researcher's classification and that of the other classifier. A consensus was arrived at in the few cases where there was a discrepancy.
3.6 Follow-up study

The review of the literature indicated that comprehension of information from audiovisual presentations may be affected by the learner's level of language proficiency. Mueller (1980) concluded that the effects of visuals seem inversely related to the listeners' language level; the higher the level of language proficiency, the less the student relies on visuals to enhance comprehension. Instead, the student derives a context from the linguistic cues provided.

To further investigate Mueller's conclusions, a smaller, follow-up study was carried out to examine the effects of visual format on a group of subjects with a higher level of language proficiency.

3.6.1 Subjects

The 14 subjects (13 male, 1 female) involved in the smaller study were all enrolled in a college-level reading, writing and study skills course, as a prerequisite to entering business and technical programs. Subjects had various first-language backgrounds, including Cantonese, Polish, Japanese, Turkish and Arabic.

3.6.2 Test material

The development and content of the stimulus stories was described in the section on development of
experimental materials. These same materials were used in this smaller study.

3.6.3 Procedure

The subjects were randomly assigned to either the audio or video condition. The same procedures employed in the main study were used with subjects in this smaller study. Subjects received the stimulus materials via the audio or video mode, and were then administered recall tests of comprehension.

Response sheets were scored according to the criteria described in the section on scoring.

3.7 Data analysis procedures

Results of the analyses are given in chapter four. However, the analyses used are presented here as part of the overall description of procedures used in the study. All analyses of variance were carried out on the University of British Columbia mainframe computer, using the statistical package BMDP. Other calculations were carried out by hand.

3.7.1 Analysis of data on mode and format effects on recall comprehension

For each visual format under each presentation mode, subjects' scores on the cued test of recall were totalled, and then converted into (1) proportions of correct responses and (2) mean correct responses for each story and standard deviations.
Next, subjects' scores for each news item were utilized as dependent variables in an analysis of variance (ANOVA) using the program BMDP:2V - Analysis of Variance and Covariance with Repeated Measures. In this analysis, news block was treated as the repeated measure or trial factor, and mode was the grouping, or between subjects factor.

The effect of the order of stories in a news block was not under investigation in this study; all stories were randomly ordered in blocks of three allow The variable news block was included in this first analysis to tease out other possible sources of variance. That is, for example, did a HR story in block one have a higher mean score than a HR story in block two, and so on.

To determine the effect of visual format without regard to the mode the effect was operating in, an ANOVA was carried out to determine if visual format affected comprehension, using the program BMDP:1V, one-way analysis of variance. The independent variable was visual format and subjects' scores served as the dependent variable.

Pairwise comparisons were next carried out to show in more detail the precise nature of the visual format effects, using Dunn's test.
To further explore the effect of visual format within the video mode only, the data was analyzed using the program BMDP:1V. Subjects' scores from the video condition were used as the dependent variable. Scheffes' post-hoc procedure was used to locate sources of significance.

3.7.2 Effects of mode and format on perceived comprehension and difficulty rating

Research question three looked at the effects of presentation mode on subjects' perceived comprehension and the effects of visual format on subjects' difficulty rating of news stories, as measured by self-reporting instruments.

Data on perceived comprehension and difficulty was not subjected to such extensive analyses, since it was not the main dependent variable under investigation in this study. Rather, it was intended to provide a potentially richer interpretation of the data on recall comprehension.

For both presentation modes, the total percentage of reported comprehension was converted into means for each news item.

Subjects in the video condition gave Ratings of Difficulty to each news story they watched. A mean rating was calculated for all the ratings given to each
news story. The results were ranked from lowest (very difficult) to highest (very easy).

The transcripts of post-treatment discussions were analyzed qualitatively, as a way of providing another possible window onto how visuals affect comprehension.

3.7.3 Data analysis: follow-up study

For each presentation mode, total recall scores within the three visual format categories were converted into mean correct responses and standard deviations.

To determine if the difference between mean scores for each mode was significant, subjects' scores for each news story were used as the dependent variable in an analysis of variance using BMDP:2V. Mode was the grouping factor and news block was treated as the repeated measure.

To determine if there was a difference in the amount of language comprehended via each of the visual formats, two one-way analyses of variance were carried out, using BMDP:1V. The first analysis was conducted on data from the video mode only, using format as the independent variable. The second analysis was carried out on data from the audio mode. In both analyses, subjects' recall scores served as the dependent variable.
3.8 Chapter summary

This chapter contains a description of the independent and dependent variables of interest in this study. The development of the experimental materials is described, as are the procedures and experimental design used in the main study, and a smaller follow-up study. Lastly, the procedures used in the data analysis for the main study and follow-up study are outlined.

Results of the data analyses are presented in chapter four. Chapter five contains possible explanations for and implications of the results.
CHAPTER FOUR

RESULTS

The results presented in this chapter are for the sample of subjects who participated in the main study, as well as for subjects who took part in the smaller, follow-up study. Results of the data analysis are organized and discussed under the following headings:

1. Effects of mode and format on recall comprehension (research questions 1 and 2).
2(a) Effects of mode on perceived comprehension (research question 3a).
2(b) Effects of format on difficulty rating (research question 3b).
3. Follow-up study (research questions 4a and 4b).

The first section presents results of analysis on research question one: Is there a difference in the amount of information comprehended (as measured by scores on a cued recall task) when material is presented via each of two modes: audio (sound only) and video (sound + picture). This section also presents results of the data analysis on research question two: In the video mode, is there a difference in the amount of language comprehended and recalled via each of the three visual formats? Hypotheses developed from this first set
of research questions will be presented at the end of this section and, based upon the results of the data analysis, will be either supported or rejected.

The second section presents results of analysis on research question 3 (a): Is there a difference in the subjects' perceived comprehension of news stories when information is presented via either the video mode or audio mode?, and 3 (b): Is there a difference in subjects' difficulty rating of news stories across each of the three formats.

The final section presents results of the analysis of data collected as part of the follow-up study. The study examined the effects of visual format with a group of subjects at a higher level of language proficiency. The following questions were addressed: 4 (a) Does the level of language proficiency affect the amount of information comprehended and recalled under the two presentation modes?, and 4 (b) Does the level of language proficiency affect the amount of information comprehended and recalled via each of the three visual formats?

Data collected during subjects' post-treatment discussion of the news stories will be considered in chapter five, as a way of providing possible insights into the data on recall comprehension.
4.1 Effects of mode and format on recall comprehension

Initially, in order to get a general idea of the number of correct responses for each visual format under each presentation mode, subjects' scores on the cued test of recall were totalled, and then converted into (1) proportions of correct responses, and (2) mean correct responses and standard deviations. The proportion of correct responses for each format and news block are presented in Table I. The mean recall scores and standard deviations for each visual format within the three news blocks are presented in Table II.

Table I
Proportion of Correct Responses for Each Format and News Block

<table>
<thead>
<tr>
<th>Visual format</th>
<th>HR</th>
<th>LR</th>
<th>TH</th>
<th>BLOCK MEAN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Video mode</strong> (N=13)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Block 1</td>
<td>.62</td>
<td>.48</td>
<td>.26</td>
<td>.45</td>
</tr>
<tr>
<td>Block 2</td>
<td>.51</td>
<td>.44</td>
<td>.37</td>
<td>.44</td>
</tr>
<tr>
<td>Block 3</td>
<td>.58</td>
<td>.45</td>
<td>.28</td>
<td>.44</td>
</tr>
<tr>
<td>FORMAT MEAN</td>
<td>.57</td>
<td>.46</td>
<td>.30</td>
<td></td>
</tr>
<tr>
<td><strong>Audio mode</strong> (N=14)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Block 1</td>
<td>.60</td>
<td>.45</td>
<td>.11</td>
<td>.38</td>
</tr>
<tr>
<td>Block 2</td>
<td>.16</td>
<td>.24</td>
<td>.17</td>
<td>.19</td>
</tr>
<tr>
<td>Block 3</td>
<td>.46</td>
<td>.28</td>
<td>.15</td>
<td>.30</td>
</tr>
<tr>
<td>FORMAT MEAN</td>
<td>.41</td>
<td>.32</td>
<td>.14</td>
<td></td>
</tr>
</tbody>
</table>
Table II
Summary of Mean Recall Scores and Standard Deviations

<table>
<thead>
<tr>
<th>BLOCK</th>
<th>FORMAT</th>
<th>VIDEO</th>
<th>AUDIO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean 1</td>
<td>HR</td>
<td>7.71</td>
<td>7.46</td>
</tr>
<tr>
<td>S.D.</td>
<td></td>
<td>1.19</td>
<td>1.85</td>
</tr>
<tr>
<td>Mean 1</td>
<td>LR</td>
<td>5.84</td>
<td>2.21</td>
</tr>
<tr>
<td>S.D.</td>
<td></td>
<td>3.53</td>
<td>1.52</td>
</tr>
<tr>
<td>Mean 1</td>
<td>TH</td>
<td>3.16</td>
<td>1.36</td>
</tr>
<tr>
<td>S.D.</td>
<td></td>
<td>2.19</td>
<td>1.78</td>
</tr>
<tr>
<td>Mean 2</td>
<td>HR</td>
<td>6.16</td>
<td>1.93</td>
</tr>
<tr>
<td>S.D.</td>
<td></td>
<td>3.33</td>
<td>1.49</td>
</tr>
<tr>
<td>Mean 2</td>
<td>LR</td>
<td>5.31</td>
<td>2.93</td>
</tr>
<tr>
<td>S.D.</td>
<td></td>
<td>2.62</td>
<td>2.30</td>
</tr>
<tr>
<td>Mean 2</td>
<td>TH</td>
<td>5.08</td>
<td>2.00</td>
</tr>
<tr>
<td>S.D.</td>
<td></td>
<td>3.49</td>
<td>2.14</td>
</tr>
<tr>
<td>Mean 3</td>
<td>HR</td>
<td>7.00</td>
<td>5.35</td>
</tr>
<tr>
<td>S.D.</td>
<td></td>
<td>2.64</td>
<td>3.02</td>
</tr>
<tr>
<td>Mean 3</td>
<td>LR</td>
<td>5.39</td>
<td>3.35</td>
</tr>
<tr>
<td>S.D.</td>
<td></td>
<td>2.98</td>
<td>1.59</td>
</tr>
<tr>
<td>Mean 3</td>
<td>TH</td>
<td>3.46</td>
<td>1.71</td>
</tr>
<tr>
<td>S.D.</td>
<td></td>
<td>1.89</td>
<td>1.58</td>
</tr>
</tbody>
</table>

Table 1 shows that, in the video mode, the highest mean proportion of correct responses occurred in the high redundancy (HR) visual format (Mean=.57), and the lowest (mean=.30) in the talking head (TH) format, as had been predicted. The mean proportion of correct
scores was lower in the audio mode, but the pattern—highest recall in the HR format (mean=.41) and lowest in the TH (.14)—was the same as for the video mode. It was expected that subject scores in the audio mode would not vary greatly from one format to another. The same pattern is evident in Table II. Mean recall scores are higher in the video mode. Within each block of three new items, subjects' obtained the highest scores for recall of HR news items.

Also of interest was the finding that, in the audio mode, the mean proportion of correct responses varied from one block to another (see Table I). For example, in Block 1, the mean proportion of correct scores was .38, while in block two the mean was .19, and .30 in block three. No such variation was evident in the video condition. The variable news block was not under investigation in this study but was included as a way of explaining some of the variance.

To determine if there was a significant block effect operating in the audio mode, subjects' scores for each news item were used as the dependent variable in an analysis of variance using the program BMDP:2V, two-way analysis of variance and covariance, with repeated measures. News block was treated as the repeated measure, and mode was the grouping factor.
A significant main effect due to mode was found \((F=11.48, df\ 1,25:p<.01)\). This finding indicated that comprehension of information was higher following presentation in the video mode than in the audio mode, as had been hypothesized.

A slightly significant effect due to block was also found \((F=3.98, df\ 2,25:p<0.05)\). As well, a significant interaction effect was found for block and mode. This finding indicated that, in the audio mode, total recall varied across blocks. For example, in block one the mean recall score for the HR format was 7.46, while in block two the mean score for the HR format was 1.93. Possible causes of this effect are discussed in chapter five.

The fact that no such effect occurred in the video mode suggests that the effect was not due to the sequence of stories within a block. All stories were randomly ordered in blocks of three so that subjects would not be able to recognize a pattern and anticipate placement of stories. The complete table for this ANOVA is presented in Table III.
Table III

Analysis of Variance Table for Mode/Block Repeated Measures Analysis

<table>
<thead>
<tr>
<th>SOURCE</th>
<th>SUM OF SQUARES</th>
<th>D.F.</th>
<th>MEAN SQUARE</th>
<th>F</th>
<th>F PROB.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mode</td>
<td>307.87546</td>
<td>1</td>
<td>307.87546</td>
<td>11.48</td>
<td>0.000</td>
</tr>
<tr>
<td>Error</td>
<td>670.34676</td>
<td>25</td>
<td>26.81387</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Block</td>
<td>22.01565</td>
<td>2</td>
<td>11.00782</td>
<td>3.98</td>
<td>0.0249</td>
</tr>
<tr>
<td>BM</td>
<td>28.86338</td>
<td>2</td>
<td>14.43169</td>
<td>5.21</td>
<td>0.0088</td>
</tr>
<tr>
<td>Error</td>
<td>138.37118</td>
<td>50</td>
<td>2.76742</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Results of data analysis so far indicate that presentation mode, one of the two main independent variables in this study, did significantly affect comprehension, as measured by scores on a test of cued recall.

Another independent variable under investigation in this study was visual format. Therefore, an analysis of variance was carried out to determine if visual format affected comprehension, using the program BMDP:1V, one-way analysis of variance. The independent variable was visual format and subjects' scores on the recall test served as the dependent variable.

A highly significant effect due to visual format was found (F=64.51, df 2,233:p>.001). The complete table
for this ANOVA is presented in Table IV. It should be noted here that this significant F indicated that visual format influenced scores; however, it makes no distinction as to which mode the effect is operating in. F was calculated on the basis of difference between mean scores for each of the nine stories, rather than mean scores for each format. The effect of visual format within the video mode is considered later in this section.

Table IV
Analysis of Variance Table for Amount of Comprehension by Visual Format

<table>
<thead>
<tr>
<th>SOURCE</th>
<th>SUM OF SQUARES</th>
<th>D.F.</th>
<th>MEAN SQUARE</th>
<th>F</th>
<th>F PROB.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Format</td>
<td>401.24411</td>
<td>2</td>
<td>200.62205</td>
<td>64.51*</td>
<td>0.000</td>
</tr>
<tr>
<td>Error</td>
<td>155.48840</td>
<td>233</td>
<td>3.10977</td>
<td></td>
<td>*p&gt;.001</td>
</tr>
</tbody>
</table>

Pairwise comparisons were then carried out to show in more detail the precise nature of the visual format effects, using Dunn's test of pairwise comparisons. The test yielded the highest significant difference between recall scores for HR and TH items (t=10.76, p<.01). Significant differences were also found between HR and LR items (t=3.70, p<.05), and between LR and TH items (t=4.68, p<.05).
Further proof of the effect of format on comprehension is evident when the scores are grouped according to visual format, and cell means are compared. In both modes, subjects scored highest in the HR format. In the video mode, the mean score for HR items was 6.88, for LR items 5.52 and 3.9 for TH items. Tables V, VI and VII give means and standard deviations for each news items within each format.

Table V

Cell Means and Standard Deviations
for HR Condition

<table>
<thead>
<tr>
<th></th>
<th>Video</th>
<th>Audio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>7.46</td>
<td>7.71</td>
</tr>
<tr>
<td>S.D.</td>
<td>1.19</td>
<td>1.85</td>
</tr>
<tr>
<td>Mean</td>
<td>6.16</td>
<td>1.93</td>
</tr>
<tr>
<td>S.D.</td>
<td>3.33</td>
<td>1.49</td>
</tr>
<tr>
<td>Mean</td>
<td>7.00</td>
<td>5.35</td>
</tr>
<tr>
<td>S.D.</td>
<td>2.64</td>
<td>3.02</td>
</tr>
<tr>
<td></td>
<td>X=6.88</td>
<td>X=4.96</td>
</tr>
</tbody>
</table>
Table VI
Cell Means and S.D. for LR Condition

<table>
<thead>
<tr>
<th></th>
<th>Video</th>
<th>Audio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>5.84</td>
<td>2.21</td>
</tr>
<tr>
<td>S.D.</td>
<td>3.53</td>
<td>1.52</td>
</tr>
<tr>
<td>Mean</td>
<td>5.31</td>
<td>2.93</td>
</tr>
<tr>
<td>S.D.</td>
<td>2.62</td>
<td>2.30</td>
</tr>
<tr>
<td>Mean</td>
<td>5.39</td>
<td>3.35</td>
</tr>
<tr>
<td>S.D.</td>
<td>2.98</td>
<td>1.59</td>
</tr>
</tbody>
</table>

$\bar{x}=5.52$  $\bar{x}=2.83$

Table VII
Cell Means and S.D. for TH Condition

<table>
<thead>
<tr>
<th></th>
<th>Video</th>
<th>Audio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>3.16</td>
<td>1.36</td>
</tr>
<tr>
<td>S.D.</td>
<td>2.19</td>
<td>1.78</td>
</tr>
<tr>
<td>Mean</td>
<td>5.08</td>
<td>2.00</td>
</tr>
<tr>
<td>S.D.</td>
<td>3.49</td>
<td>2.14</td>
</tr>
<tr>
<td>Mean</td>
<td>3.46</td>
<td>1.71</td>
</tr>
<tr>
<td></td>
<td>1.89</td>
<td>1.58</td>
</tr>
</tbody>
</table>

$\bar{x}=3.90$  $\bar{x}=1.69$
4.1.2 Visual format effects within the video mode

To further explore the effect of visual format within the video mode, the data was analyzed using the program BMDP:1V. One-way analysis of variance over the three visual format categories produced a highly significant visual format effect within the video mode ($F_{2,115}=13.8, p<.01$). The complete table for this ANOVA is presented in Table VIII.

Table VIII
ANOVA Table for Format by Comprehension
(Video mode only)

<table>
<thead>
<tr>
<th>SOURCE</th>
<th>SUM OF SQUARES</th>
<th>D.F.</th>
<th>MEAN SQUARE</th>
<th>F</th>
<th>F PROB.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Format</td>
<td>194.4094</td>
<td>2</td>
<td>97.2047</td>
<td>13.80</td>
<td>0.000</td>
</tr>
<tr>
<td>Error</td>
<td>810.0288</td>
<td>115</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Scheffes' post-hoc procedure was used to locate the sources of significance. Results of the comparison among visual format means are summarized in Table IX.
Table IX
Comparison Among Format Means: Video Mode

<table>
<thead>
<tr>
<th></th>
<th>X1</th>
<th>X2</th>
<th>X3</th>
</tr>
</thead>
<tbody>
<tr>
<td>X1 (High redundancy)</td>
<td>6.88</td>
<td>--</td>
<td>5.90*</td>
</tr>
<tr>
<td>X2 (Low redundancy)</td>
<td>5.43</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>X3 (Talking head)</td>
<td>3.72</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

** p < .01 (Scheffe F)
* p < .05 (Scheffe F)

The comparisons summarized in Table IX revealed that there was a significant difference between HR and TH formats. Mean scores for HR items are significantly (p < .01) greater than scores for either LR or TH news items. Mean scores for LR items are significantly (p < .05) greater than scores for TH items.

These results were as expected, and followed a pattern hypothesized by the researcher. The implications of these results will be discussed in chapter five.

4.2 Testing hypotheses 1, 2, 3, 4

In summary, it appears there is a difference in the amount of information comprehended when stimulus material is presented via each of two modes. Based on a significant F for mode effects, the first null-hypothesis: There are no differences between the two presentation modes in terms of the amount of information
comprehended and recalled, can thus be rejected in favour of the research hypotheses: There are differences between the two presentation modes in terms of the amount of information comprehended and recalled. Results of data analysis clearly indicated significantly greater recall when material was presented via the video mode.

The second null hypotheses can also be rejected on the basis of a significant effect due to format and significant differences between recall scores across the three visual format categories. Null hypothesis 2 was stated in chapter one: There are no differences among the three visual format treatment conditions in terms of amount of information comprehended and recalled.

Null hypotheses 3 can also be rejected in favour of the research hypotheses. The third null hypothesis stated: Within the video mode, comprehension will not be highest among students in the HR treatment condition. Based on a comparison of mean scores across the visual format categories and results of Scheffe's post-hoc procedure, it can be rejected in favour of the research hypotheses: Within the video mode, comprehension will be highest among students in the HR treatment condition.

The final null hypotheses to be developed from the first set of research questions stated: Within the video mode, comprehension will not be lowest among subjects in
the TH treatment condition. Based on a comparison of mean scores across the visual formats and results of Scheffe's post-hoc procedure, it can also be rejected in favour of the research hypotheses: Within the video mode, comprehension will be lowest among subjects in the TH treatment condition.

4.3 Effects of mode and format on perceived comprehension and difficulty rating

Research question three looked at the effects of presentation mode on subjects' perceived comprehension and the effects of visual format on subjects' difficulty ranking of news items. Hypotheses 5 and 6 were developed from research question three. Hypothesis 5 stated: There are differences between the two presentation modes in terms of subjects' perceived comprehension of stimulus material. Hypotheses 6 stated: In the video mode, there are differences among the three visual formats in terms of difficulty ratings assigned by subjects.

Data on perceived comprehension and difficulty was not subjected to such extensive analyses, since these were not the main dependent variable under investigation in this study. Instead, it was intended to provide a potentially richer interpretation of the data on recall comprehension.
4.3.1 Effects of mode on perceived comprehension

Subjects' perceived comprehension was measured with a self-report. Following questions on content of each news item, subjects were asked:

What percentage of this news story do you think you understood? Show the amount by putting a cross: "X" on the scale below:
Nothing 10 20 30 40 50 60 70 80 90 Everything

Data from this item were used to test the study's fifth hypothesis.

For both presentation modes, the total percentage of reported comprehension was converted into means for each news item. Table X clearly shows that there is a difference between the two groups in terms of their self-reported perceived comprehension of news stories. For all news stories, subjects in the video mode reported greater perceived comprehension than subjects in the audio mode. The mean for the video population sample was 50.09, while the mean for the audio sample was 32.54. The complete set of means is listed in Table X.
Table X
Means for Audio and Video Groups' Perceived Comprehension Scores

<table>
<thead>
<tr>
<th>STORY #</th>
<th>VISUAL FORMAT</th>
<th>VIDEO</th>
<th>AUDIO</th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td>HR</td>
<td>64.62</td>
<td>44.29</td>
</tr>
<tr>
<td>Two</td>
<td>LR</td>
<td>39.24</td>
<td>23.57</td>
</tr>
<tr>
<td>Three</td>
<td>TH</td>
<td>38.46</td>
<td>23.57</td>
</tr>
<tr>
<td>Four</td>
<td>LR</td>
<td>47.70</td>
<td>32.85</td>
</tr>
<tr>
<td>Five</td>
<td>TH</td>
<td>50.77</td>
<td>29.29</td>
</tr>
<tr>
<td>Six</td>
<td>HR</td>
<td>53.08</td>
<td>30.00</td>
</tr>
<tr>
<td>Seven</td>
<td>TH</td>
<td>40.00</td>
<td>29.29</td>
</tr>
<tr>
<td>Eight</td>
<td>HR</td>
<td>59.24</td>
<td>40.00</td>
</tr>
<tr>
<td>Nine</td>
<td>LR</td>
<td>57.50</td>
<td>40.00</td>
</tr>
</tbody>
</table>

X=50.09  X=32.54

4.3.2 Effects of visual format on ratings of difficulty

At the end of the test period, subjects in the video condition gave Ratings of Difficulty to each news story they had watched. They rated each story on a ten-point scale, ranging from 1=Very Difficult to 10=Very Easy. A copy of the rating scale is in Appendix C. Data from this item were used to test the study's sixth hypothesis.

A mean rating was calculated for all the ratings given to each news story by subjects in the video
condition. The results are presented in Table XI. Table XII presents the same results, but here they are ranked from lowest (very difficult) to highest (very easy) means.

Table XI: Mean Scores for Ratings of Difficulty

<table>
<thead>
<tr>
<th>STORY</th>
<th>FORMAT</th>
<th>MEAN RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>HR</td>
<td>6.31</td>
</tr>
<tr>
<td>2</td>
<td>LR</td>
<td>4.47</td>
</tr>
<tr>
<td>3</td>
<td>TH</td>
<td>4.85</td>
</tr>
<tr>
<td>4</td>
<td>LR</td>
<td>3.38</td>
</tr>
<tr>
<td>5</td>
<td>TH</td>
<td>5.15</td>
</tr>
<tr>
<td>6</td>
<td>HR</td>
<td>5.54</td>
</tr>
<tr>
<td>7</td>
<td>TH</td>
<td>4.61</td>
</tr>
<tr>
<td>8</td>
<td>HR</td>
<td>7.23</td>
</tr>
<tr>
<td>9</td>
<td>LR</td>
<td>7.00</td>
</tr>
<tr>
<td>STORY</td>
<td>FORMAT</td>
<td>MEAN RATING</td>
</tr>
<tr>
<td>-------</td>
<td>--------</td>
<td>-------------</td>
</tr>
<tr>
<td>4</td>
<td>LR</td>
<td>3.38</td>
</tr>
<tr>
<td>2</td>
<td>LR</td>
<td>4.47</td>
</tr>
<tr>
<td>7</td>
<td>TH</td>
<td>4.61</td>
</tr>
<tr>
<td>3</td>
<td>TH</td>
<td>4.85</td>
</tr>
<tr>
<td>5</td>
<td>TH</td>
<td>5.15</td>
</tr>
<tr>
<td>6</td>
<td>HR</td>
<td>5.54</td>
</tr>
<tr>
<td>1</td>
<td>HR</td>
<td>6.31</td>
</tr>
<tr>
<td>9</td>
<td>LR</td>
<td>7.00</td>
</tr>
<tr>
<td>8</td>
<td>HR</td>
<td>7.23</td>
</tr>
</tbody>
</table>

Clearly, there is a progression of difficulty of which students seem to be aware, and which generally follows a pattern hypothesized by the researcher. The hypothesis of difference between formats was supported.

Of particular interest is the high difficulty ranking given to two of the stories with an LR visual format. It had been expected that stories containing TH visual formats would be perceived as most difficult, since they had obtained the lowest scores. Possible explanations for these rankings are discussed in chapter
five. The stories containing HR visual formats were ranked among the easiest, as had been expected.

4.4 Results of follow-up study

The smaller, follow-up study examined the effect of visual format with a group of subjects at a higher level of language proficiency. Among the 14 subjects, comprehension was measured with a cued-recall task, as in the main study.

The study addressed the following questions:

4 (a). Does the level of language proficiency affect the amount of information comprehended and recalled under the two presentation modes?

(b). Does the level of language proficiency affect the amount of information comprehended and recalled via each of the three visual formats?

These research questions were operationalized and the following research hypotheses developed:

H: There are no differences between the presentation modes in terms of the amount of information comprehended and recalled.

H: In the video mode, there are no differences among the three visual format treatment conditions in terms of the amount of information comprehended and recalled.

For purposes of statistical analysis, these research hypotheses are restated as null hypotheses near the end of this section.
4.4.1 Effects of mode and format on recall comprehension

To get a general idea of the number of correct responses for each visual format under each presentation mode, subjects' scores on the cued test of recall were totalled, and then converted into mean correct responses and standard deviations. Mean recall scores were only slightly higher in the video mode. As well, there was little variation in scores across the three visual formats. The mean recall scores and standard deviations for each visual format within the three news blocks are presented in Table XIII.

Table XIII
Mean Recall Scores and Standard Deviations for Follow-Up Study

<table>
<thead>
<tr>
<th>Visual format</th>
<th>HR</th>
<th>LR</th>
<th>TH</th>
<th>BLOCK MEAN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Video mode</strong> (N=7)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Block 1</td>
<td>9.29</td>
<td>7.58</td>
<td>7.29</td>
<td>8.05</td>
</tr>
<tr>
<td>Block 2</td>
<td>6.72</td>
<td>6.86</td>
<td>7.43</td>
<td>7.03</td>
</tr>
<tr>
<td>Block 3</td>
<td>8.58</td>
<td>8.00</td>
<td>6.29</td>
<td>7.62</td>
</tr>
<tr>
<td><strong>FORMAT MEAN</strong></td>
<td>8.20</td>
<td>7.48</td>
<td>7.03</td>
<td></td>
</tr>
<tr>
<td><strong>Audio mode</strong> (N=7)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Block 1</td>
<td>7.15</td>
<td>7.29</td>
<td>7.15</td>
<td>7.19</td>
</tr>
<tr>
<td>Block 2</td>
<td>7.15</td>
<td>7.00</td>
<td>5.86</td>
<td>6.67</td>
</tr>
<tr>
<td>Block 3</td>
<td>8.72</td>
<td>8.15</td>
<td>6.29</td>
<td>7.72</td>
</tr>
<tr>
<td><strong>FORMAT MEAN</strong></td>
<td>7.68</td>
<td>7.48</td>
<td>6.44</td>
<td></td>
</tr>
</tbody>
</table>
To determine if the difference between mean scores for each mode was significant, subjects' scores for each news story were used as the dependent variable in an analysis of variance using the program BMDP:2V. Mode was the grouping factor, and news block was treated as the repeated measure. News block was included to determine if scores varied significantly across blocks.

The ANOVA showed no significant difference between the two presentation modes. This finding indicated that recall of information was not significantly higher in either of the two modes, as had been hypothesized.

A non-significant effect due to block indicated that total recall did not vary across news block. The complete table for this ANOVA is presented in Table XIV.

Table XIV

Follow-up Study: ANOVA Table for Mode/Block Repeated Measures Analysis

<table>
<thead>
<tr>
<th>SOURCE</th>
<th>SUM OF SQUARES</th>
<th>D.F.</th>
<th>MEAN SQUARE</th>
<th>F</th>
<th>F PROB.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mode</td>
<td>4.19841</td>
<td>1</td>
<td>4.19841</td>
<td>0.19</td>
<td>0.6743</td>
</tr>
<tr>
<td>Error</td>
<td>271.49206</td>
<td>12</td>
<td>22.62434</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Block  | 18.39683       | 2   | 9.19841     | 2.40 | 0.1120  |
| BM     | 4.7778         | 2   | 2.38889     | 0.62 | 0.5445  |
| Error  | 391.93651      | 24  | 3.83069     |     |         |
To determine if the differences between the mean recall scores for each visual format were significant, the data was analyzed using the program BMDP:1V. One-way analysis of variance over the three visual format categories yielded a non-significant visual format effect within the video mode ($F_{2,60}=1.7368, n.s.$). A second ANOVA also yielded a non-significant visual format effect ($F_{2,60}=1.5684, n.s.$) within the audio mode. The complete results of these ANOVA's are presented in Table XV and Table XVI.

Table XV
Follow-up Study:
ANOVA Table for Format by Comprehension
(VIDEO MODE)

<table>
<thead>
<tr>
<th>SOURCE</th>
<th>SUM OF SQUARES</th>
<th>D.F.</th>
<th>MEAN SQUARE</th>
<th>F</th>
<th>F PROB.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Format</td>
<td>15.0794</td>
<td>2</td>
<td>7.5397</td>
<td>1.7368</td>
<td>.1848</td>
</tr>
<tr>
<td>Error</td>
<td>260.4756</td>
<td>60</td>
<td>4.3413</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table XVI

Follow-up Study:

ANOVA Table for Format by Comprehension

(AUDIO MODE)

<table>
<thead>
<tr>
<th>SOURCE</th>
<th>SUM OF SQUARES</th>
<th>D.F.</th>
<th>MEAN SQUARE</th>
<th>F</th>
<th>F PROB.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Format</td>
<td>18.6667</td>
<td>2</td>
<td>9.3333</td>
<td>1.5684</td>
<td>.2168</td>
</tr>
<tr>
<td>Error</td>
<td>357.0471</td>
<td>60</td>
<td>5.9508</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

These findings indicated that, among these more proficient language learners, the type of visual format had little effect on how much material was comprehended and recalled, as had been hypothesized.

4.4.2 Testing hypotheses 7 and 8

The first null-hypotheses developed from the research questions for this follow-up study stated: There are differences between the presentation modes in terms of the amount of information comprehended and recalled. Based on the non-significant F obtained in the two-way ANOVA, that null-hypothesis was rejected in favour of the research hypothesis: There are no differences between the two presentation modes.

The second null-hypotheses stated: In the video mode, there are differences among the three visual formats in terms of the amount of information comprehended and recalled.
Based on the finding of non-significance in the one-way ANOVA, it was rejected and the research hypothesis was accepted.

4.5 Chapter summary

The results of the procedures used in analysis of the data were summarized in chapter four. The results indicated that comprehension was significantly higher when stimulus materials were presented in the video mode. Also, the difference between recall scores across the three visual formats was significant. The results also indicated that perceived comprehension was higher among subjects in the video mode. In the video mode, subjects rated talking head stories as the most difficult to understand, and high redundancy stories as the easiest.

Results of the follow-up study indicated that, among subjects at a higher level of language proficiency, comprehension did not vary significantly between the two presentation modes. As well, the difference between the recall scores across the visual formats was not significant.

These results and possible implications are discussed in chapter five.
Chapter Five
Discussion, Implications and Limitations

The results of the main study showed that NNS comprehension of language was indeed greater when stimulus materials were presented via the video mode.

Significant differences were also found between language comprehension scores for each of the three visual formats under investigation. Highest scores were obtained for the HR format, and lowest for the TH format.

Results also seem to suggest that subjects in the video condition perceived television as being easier to understand. Subjects in the video condition also rated HR stories as the easiest to understand.

From the results of the follow-up study, it appears the comprehension-facilitating effect of visuals is not as strong for subjects of higher proficiency.

5.1 Between-mode comparison

The first hypothesis of the main study concerned differences in comprehension (measured as score on test of cued recall) of verbal information presented via two modes: audio (sound only) and video (sound + picture). Examination of the results indicated that there was a
between-mode difference in comprehension scores and the null hypothesis of no difference was rejected. The analyses next focused on the differences between modes.

The results indicated that the lowest mean score ($\bar{X}=3.17$) was obtained when the stimulus news stories were presented through the audio mode. In light of the literature reviewed in chapter two regarding the role of the visual element in communication, the results were not unexpected. Riley's (1984) discussion of viewing comprehension, for example, emphasized the role of the visual (non-verbal) element of a communicative event in helping listeners predict and comprehend the verbal message. Willis (1983) made the point that NNSs are likely to rely more heavily on visual clues to support their comprehension than are NSs and that "video is an obvious medium for helping students to interpret visual clues effectively" (p.29). Subjects assigned to the audio condition, without access to the video channel, could thus be expected to understand less than subjects in the video condition.

The findings are also in keeping with results of first-language studies on mode of presentation and learning from media. For example, Greenfield & Beagle-Roos (1988), in a review of studies of news recall by children, adolescents and adults, found that greater recall occurred when material was presented in a
television format than in radio. The relationship between mode and score is explored further in the discussion of visual format effects.

5.1.1 Mode and perceived comprehension

Further proof of the value of audiovisual presentations is evident in the data collected on subjects' perceived comprehension. Examination of the results indicated that there was a between-mode difference in perceived comprehension, as hypothesis five stated, and the null hypothesis of no difference was rejected. For all news stories, subjects in the video condition reported greater perceived comprehension.

The results are in agreement with studies on modality preference, discussed in chapter two. Salomon (1979) theorized that television can be easier to understand than non-visual media. Later, Salomon and Leigh (1984), tested the theory and found that students preferred the medium they found easiest to use; the easier it was to use, the more they felt they learned from it.

The results suggest that video can be a useful teaching aid, since students find it easier to understand.
5.1.2 Comprehension and dual coding theory

What could account for the superiority of recall in the video mode? That NNSs rely on visual, contextual clues to understand verbal content has already been noted. But the results may also be interpreted within the framework of Paivio's (1986) dual-coding theory, discussed in chapter two.

According to the dual-coding theory, picture items can be stored in the memory, and made available for retrieval, in terms of two separate codes—a verbal code and a picture code—while items unaccompanied by picture material would normally have only a verbal code. Thus, since the video presentation was encoded in terms of both picture and verbal content, it could be more readily retrieved from memory than purely verbal presentations; if one code was forgotten, then the other could be used instead. Paivio's theory also proposes that much more informational content can be absorbed rapidly from pictures than is possible from words, since people can process several visual stimuli simultaneously.

Paivio (1986), in a discussion of the implications of the dual-coding theory for second language learning, notes: "The theory leads to a strong emphasis on the role of situational contexts and images in second language learning" (p.257).
This theory seems to offer a possible explanation for the results of the first hypothesis, but it is difficult to offer an adequate explanation for these findings, as so little research has been conducted in this area.

5.1.3 Mode/block interaction

All of the nine news stories selected for this study were randomly ordered in blocks of three, so that subjects would not be able to recognize a pattern and anticipate the placement of stories, which may have become confounded with visual format effects during recall.

Analyses of between-mode differences revealed that in the audio mode, the mean proportion of correct responses varied from one news block to another. For example, in block one, the mean proportion of correct scores was .38, while in block two the mean was .19, and .30 in block three. No such variation was evident in the video mode.

To tease out some of the sources of variance, an analysis of variance was carried out, and a significant mode/block interaction was found. In block one, for example, the mean score for the HR format was 7.71, while in block two the mean score for the HR format was 1.93, and 5.35 in block three. However, in the video mode, scores did not vary significantly within a format.
That no such effect occurred in the video mode suggests that the effect was not due to the sequence of stories in a block, but rather to some other variables which did not appear to be operating in the video mode.

The mode/block interaction is difficult to account for but may possibly be explained by syntactic differences, differences in complexity of vocabulary, and speed of delivery, as a study of transcripts of subjects' post-treatment discussion indicated. At the end of the testing period, subjects were grouped and asked to discuss which stories they had difficulty understanding, which stories were easy, and why.

Transcripts from the audio groups' discussion carried repeated references to the fast rate of delivery, difficult vocabulary and sentence structure. The following quotes from the transcripts give some indication of the types of comments from the students:

The person who was speak was fast and that's why we don't understand, and some words we don't know the meaning of the word, we can't understand.

I didn't get the main idea because you know you can understand words but not all the sentences what's the meaning.

We find some stories is easy because the language is easy. We understand what they're saying and some stories difficult because the language is difficult.

We find some stories difficult because speaker speak too quickly.
I find some stories difficult because some vocabulary I don't understand, and many sentences in story I don't understand so is difficult.

That the block/mode effect did not occur in the video mode seems to indicate that students used the visuals to help decode the verbal message. They weren't solely dependent on the linguistic content, as were those subjects who heard only the soundtrack from the stories.

5.2 Visual format effects

While it appears that the presence of visual images aids NNS comprehension of spoken language, the discussion in chapter two regarding the relationship between the aural and visual channels of a video presentation indicated that the presence of a visual context per se is not always a sufficient precondition for improved learning. That is to say, some types of visual formats facilitate comprehension, while other formats may actually cause distraction and interfere with learning. Chu and Schramm (1967), for example, in their review of educational media research, concluded that visuals will improve learning from audiovisual messages only when the visual contributes to the information contained in the audiotrack. Hsia (1968) concluded that the audiovisual channel has advantages
over the audio or visual alone only if the stimuli presented are almost identical, i.e. redundant.

5.2.1 Visual format effects in the video mode

Based on the literature regarding the effects of different types of visual formats on comprehension, hypotheses two, three and four were developed.

The second hypothesis of this study concerned differences in language comprehension across the visual format categories, under the video presentation mode. To test the hypothesis, a one-way analysis of variance was carried out over the three visual formats within the video mode. Examination of the results indicated that there was a significant difference between language comprehension scores for each of the three visual formats, and the null hypothesis was rejected.

The findings did not contradict the results of first-language studies carried out on visual format and recall. Gunter (1979, 1980a), for example, in a series of studies set out to answer the question: Do visuals such as film or talking head enhance learning from news or do the pictures result in the presentation of irrelevant and distracting visual output which inhibits information gain? He found that free recall of television news stories was influenced by the type of pictures carried in the video channel. More recently, Drew and Reese (1984) reported that children who watched a newscast
with film performed much better on recall and understanding tests than those who viewed a newscast with only a news anchor (talking head) reading.

The analyses next focused on the differences between visual formats.

The third hypothesis concerned language comprehension scores in the HR treatment condition. Comparisons of cell means for the visual formats revealed that mean scores for HR items were significantly greater than scores for either LR or TH news items, and the null hypothesis was rejected.

Comparisons of visual format means also showed that scores for the LR news items were significantly greater than scores for the TH stories. Thus, the fourth null hypothesis, which stated that language comprehension would not be lowest for the TH format, was rejected.

In light of the literature on the relationship between the aural and visual channels, and literature on visual format effects and television news recall, the results were not unexpected. The results were surprising, however, in light of some of the broad claims which second-language teachers and researchers have made on behalf of the video medium.

The results under the high redundancy format are similar to those of the experiment carried out by Son, Reese & Davie (1987) on the effects of visual-verbal
redundancy on learning from television news. Results showed high redundancy produced greater recall than did low redundancy. The same results were obtained in a study by Drew & Grimes (1987) on recall and story understanding in television news. Drew & Grimes concluded:

When watching redundant television news, viewers focused most attention on the audio while still attending to the video. When there is a conflict between the audio and video, however, viewers attend to the video at the expense of the audio. (p.459)

Fisher (1984) has found that when younger children (less competent language learners) find conflict between information presented in the linguistic and visual modes, they "choose to ignore the linguistic mode and concentrate on the visual" (p.88).

The results under the low redundancy format are in agreement with findings of a study carried out by Edwardson, Grooms & Proudlove (1981). They found greater recall of facts delivered in television news audio when the facts were accompanied by film rather than by a talking head, even when the film did not convey those facts.

In the present study, the presence of a visual aided language comprehension, even when the pictures did not correspond to the verbal information. Lowest scores were obtained for the talking head format, where the subjects saw only the news anchor reading a script.
Stories in the high redundancy category best facilitated language comprehension. It's difficult to determine, however, how viewers divided their attention between the audio and video channels, as this study did not measure visual recall.

The results can be examined within the framework of Paivio's dual coding theory, as were the results of the first hypothesis. But the findings of this present study also lend credence to Severin's (1967) cue-summation theory, discussed in chapter two. Applied to video recordings or television news, this theory predicts that film not conveying information consistent with the story would be distracting.

5.2.2 Effects in the audio mode

Interestingly, scores in the audio mode followed the same pattern as scores in the video presentation. Highest scores were obtained for the HR format, and lowest scores were obtained for stories with a TH format. It should be restated here, however, that total scores were higher in the video mode, and scores for each visual format were also significantly higher in the video mode, providing further evidence of the effect of visuals on language comprehension.

The format effects in the audio mode contradicts results of a study by Gunter (1979), where no significant format effects occurred in the audio mode.
The fact that significant differences were found in this study may possibly be explained in two ways:

1. Differences in stimulus materials and recall tasks. Gunter's study exposed students to very short (4-6 seconds) news headlines. Each news sequence was followed immediately by a test of free recall. Subjects were thus required to retain only simple verbal labels representing each item.

2. Differences in language background. Gunter's study used native speakers, whose comprehension, unlike the second language learners' in the present study, is less likely to be affected by syntactic complexity, rate of delivery, etc. This assumption is supported by the results of the follow-up study. That study used subjects with greater language proficiency, and found no format effects in the audio mode.

The assumption is further supported by the interaction between the audio mode and story block. That no such effect occurred in the video mode suggests that the effect was due to variables which did not appear to be operating in the video mode. It seems subjects in the video condition, upon hearing difficult vocabulary or sentences, used the visuals to help decode the verbal message.
These same variables, including syntactic complexity and vocabulary, may also account for the variation between scores in the audio mode.

5.2.3 Visual format and rating of difficulty

Further evidence of the comprehension-facilitating effect of high audio/video redundancy comes from ratings of difficulty subjects assigned to each of the nine news stories. Subjects in the video condition rated each story on a ten-point scale, with 1=Very Difficult and 10=Very Easy. Examination of the data showed there were differences among the three visual formats in terms of assigned difficulty ratings, and the null hypothesis of no difference was rejected.

When ratings were ranked from lowest (very difficult) to highest (very easy), the HR stories were ranked 6, 7 and 9, showing that subjects had indeed found stories with high audio/video correspondence easier to comprehend.

Of particular interest was the high difficulty rating assigned to LR stories; two LR stories were ranked 1 and 2. It had been expected that stories containing TH formats would be rated the most difficult, since the lowest scores occurred in that format. But the high difficulty ratings do, however, give more credence to the comprehension-facilitating effects of visuals, even when the visuals do not
correspond to the verbal information. Although subjects found the story difficult, they nevertheless were able to understand more of the LR story content than the TH story.

Examination of subjects' post-treatment discussion gives some indication of why subjects rated stories as they did. The transcripts contained frequent references to story number 1, a HR story about winter weather in Vancouver, and number 8, a HR story about new city buses for Vancouver. Following are quotations taken from the transcripts:

I think the first one is easy to understand because we got the pictures to help us and the second one is difficult.

I think that some stories was difficult because reporter talks fast, and I think some were very easy like the bus.

Okay, I think the story of the bus was very easy because it show the picture.

I feel the first one is easy to understand because I see the picture and difficult is the seventh (TH story about national politics), we have only one picture to show us what is going on so I don't understand.

Examination of the transcripts also suggested that subjects' prior knowledge of a subject may have influenced comprehension. The following quotation, for
example, suggests the presence of background knowledge and interest:

Number 8. It is really easy to me because I always have to go by bus and the bus always full and not enough buses so I think B.C. Transit will get some new buses for Vancouver.

It's difficult to estimate, however, how much of a role background knowledge and interest played on the basis of simply studying transcripts. Stories were selected for this study on the basis of visual format, rather than content. All items had been featured in newscasts about three months before the study so that there were no recency biases for particular news stories.

That prior knowledge may have affected comprehension is not surprising, in light of the literature on the role of background knowledge in listening comprehension. The top-down approach to listening, for example, places great importance on the role of such knowledge. The listener doesn't rely only on linguistic evidence to decode utterances; he also uses previous knowledge and information (also known as scripts or schemas) to help interpret the message. Rouner (1987) points out that, "There may be several scripts for the same individual for an activity as mundane as watching news" (p.71).

To understand a television program, learners not only require background knowledge of the subject, but
also knowledge relating to the program's format and media conventions. Second language students not familiar with the presentation format, or structure, of television newscasts could probably improve their use of television if they were made aware that a definite structure exists. The literature on development of listening skills stresses the importance of pre-listening activities for providing students with schemas or scripts that will help them predict and infer information from what they are hearing.

Implications for selection of video materials and task design quickly become apparent. The more background knowledge which is assumed in a particular discourse, the more difficult that discourse will be for students to comprehend if they don't share that knowledge.

5.3 Visual format and language proficiency

A study of the literature on media and language learning indicated that the comprehension-facilitating effects of visuals is related to level of language proficiency. Therefore, a smaller study was carried out to examine the effects of visual formats with a group of subject at a higher proficiency level. Based on the literature reviewed in the second chapter, two hypotheses were developed.
The first hypothesis of this follow-up study concerned differences in comprehension of verbal information presented via the two modes. Examination of the results indicated that there was no difference in language comprehension scores between the two modes, and the null hypothesis of between-mode difference was rejected. The second null hypothesis of difference between the visual format scores was also rejected.

These findings indicated that, among these more proficient learners, the mode of presentation and type of visual format had little effect on how much verbal material was comprehended and recalled. In light of the literature on visuals and language proficiency, the results were not unexpected. Mueller (1980) found that the effect of visuals seemed inversely related to the listeners' level of language proficiency: "The visuals do not seem to enhance comprehension, however, if because of more extensive skills the student is able to derive a context from the linguistic cues provided" (p.340).

Possibly the same effect was operating in this present follow-up study. The students, because of their greater knowledge of the language, were less dependent on the visual to provide clues to decoding the verbal message.
Results of the follow-up study should not be seen simply in terms of language proficiency. Results should also be considered relative to the level of linguistic difficulty of the verbal channel and the level of comprehensibility of the visual channel. With a more difficult verbal message or a more unfamiliar visual message, the results may have been different.

5.4 Implications

A review of the literature on video and second language learning uncovered a paucity of empirical data on the suitability and effectiveness of video for language learning. Despite the lack of empirical evidence, researchers made broad claims about the value of the medium. "Video is widely recognized as a viable and effective medium for SL instruction," wrote Silva (1983). Among other claims made on behalf of video is its ability to increase retention of material and, by giving visual support, aid comprehension of spoken discourse, making the medium a valuable source of language input and aiding language acquisition (Willis, 1983).

The present study set out to determine the effectiveness of video as a language teaching aid by collecting empirical data on the effects of mode, visual format and language proficiency on language comprehension. Results indicated some of the larger
claims made on behalf of the video medium should be approached with caution. In particular, the results prompt a re-examination of the use of certain types of video materials, especially those with contrasting information in the audio and video channels. The results also reinforce the need to develop criteria for selection of video materials, and for when and how to use video with particular groups of learners.

Claims that video enhances recall were substantiated by the finding of greater recall under the video presentation mode. However, the study also showed that some types of visuals better facilitate language comprehension than others. It appears video sequences in which the audio and video channels contain similar or redundant information best facilitate language comprehension. But even when the audio and video channels contain dissimilar information, comprehension scores were greater than when the only visual shown was a newsreader (talking head).

The results of the main study go some way toward answering a question posed by MacWilliam (1986): Does the visual element of video introduce any additional factors, apart from linguistic, which may inhibit its usefulness as a source of language input? The interrelationship between the audio and video channels may create a situation where information in the visual
conflicts with the verbal message, resulting in "a lot of viewing and a little comprehension at a linguistic level" (MacWilliam, p.133).

The results also raise questions about the effectiveness of video as a source of comprehensible input.

As Krashen and other second language acquisition (SLA) researchers have used the term, comprehensibility of input is usually seen as language comprehension, but MacWilliam (1986) used the term to refer to comprehension of nonverbal, extralinguistic information. As the results of the study show, visual comprehension is just as complex as language comprehension, and thus should be considered in any theory of SLA.

Krashen claims that learners understand language that is not comprehensible by using context and other extralinguistic information, and recommends the use of video recordings as good sources for acquisitional input: "The advantage of videotaped materials is that the visual and contextual clues are present to support comprehension" (Krashen et.al., 1984, p.268). Implicit in this quotation is Krashen's assumption that SL learners understand contextual, visual clues; contextual understanding is taken as a given in Krashen's theory of SLA. But, as this study seems to indicate, visual and contextual clues don't necessarily support
comprehension, and learners don't necessarily comprehend visual clues. If visuals are to aid language comprehension, learners have to understand the contextual information, such as background knowledge and information from prior discourse.

The finding that contextual or visual clues don't always facilitate language comprehension has important implications for theories of the role of context in language development.

Among SLA researchers, there is widespread agreement that contextual information plays an important role in SL development by aiding language understanding. However, some researchers have pointed out that there is little empirical research to substantiate the assumption that SL learners understand contextual information (Mohan & Helmer, 1988).

Mohan and Helmer (1988) contrast the 'traditional' view of the role of context in language learning, in which contextual understanding is presupposed, with the 'social semiotic' view, which doesn't assume that language learners understand context:
A different view of the relation of context and language learning emerges in Halliday's concept of language as social semiotic (Halliday 1978). Context is not seen as a given, nor as an obvious physical setting, but as a sociocultural reality which is learned through communicative interaction. 'A child learning language is at the same time learning other things through language--building up a picture of the reality which is around him and inside him....A social reality (or a 'culture') is itself an edifice of meanings--a semiotic construct' (Halliday 1978, pg.1-2). Thus the child is learning language and culture at the same time and there is therefore a complex and dynamic relationship between the development of language and the development of contextual, sociocultural understanding. (p. 278).

Results of this present study contradict the traditional view of the relation of context and language learning and are consistent with results of a study by Mohan and Helmer (1988). That study found understanding of English speakers' gestures by preschool children varied according to age and cultural background. Significant differences in gesture comprehension were found in favour of native speakers over ESL learners.

Findings in this present study emphasize the need to pay careful attention not only to the verbal content of a video selection, but also to the visual message. The level of comprehensibility of the visual channel has to be considered. Particular attention should be paid to the degree of correspondence between information presented simultaneously through the aural and visual channels. MacWilliam (1986) and Selinker (1986), for
example, recommend the use of soap operas, with their convergent audio and video channels, as excellent sources of input.

Results of the follow-up study suggest that even if video sequences are chosen carefully, the comprehension-facilitating effect of visuals may not be as strong for students of high proficiency. As mentioned in the previous section, results of the follow-up study should also be considered relative to the level of linguistic difficulty of the verbal channel and the level of comprehensibility of the visual channel. With a more difficult verbal message or a more unfamiliar visual message, the results may well have been different.

5.5 Limitations of the present study

One of the limitations of this study concerned difficulties associated with trying to assess the value of a medium as complex as television by studying the effects of single, isolated variables. As researchers such as Clark & Salomon (1986) have pointed out, the complex nature of the medium sometimes makes it difficult to control for all variables. As much as possible in this present study, efforts were made to control for effects of possible confounding variables. Since naturalistic data was used in the treatment, uncontrolled differences in content may have become
confounded with format differences, but this is by no means clear from the data.

Nevertheless, since this particular study looks at an under-researched area, its results are probably valuable for researchers who investigate it in the future.

Another limitation of this study concerns the manner in which comprehension was measured. It is recognized that requiring a written response may have involved variables other than comprehension. However, any confounding effect this may have caused would be consistent across modes and visual formats which were measured. This response method does occur in classrooms, and it was considered more amenable to objective scoring than having subjects verbally recall the answers.

Results of the smaller, follow-up study may well have been different if the stimulus video materials had contained a more difficult verbal message or a more unfamiliar visual message. Further studies should be carried out to determine the effect of visuals with more proficient learners.

5.6 Suggestions for further research

This study was intended to act as a basis from which further studies on the effects of video on language learning may be developed. The categories of visual format types under investigation here were
somewhat crude, intended to identify broad experimental effects.

Further research might therefore concern itself with replicating the present study, using similar stimulus materials to determine the effects of audio/video redundancy on understanding. Research evidence has suggested that picture content/verbal-content relevance can be varied considerably so as to enhance or interfere with comprehension from a video sequence.

Other research might be concerned with determining the effects of other stimulus material, such as soap operas or situation comedies, on comprehension. One important focus might be content analyses of different program types to assess the redundancy of information presented through the audio and video channels.

It might be particularly interesting to carry out content analyses of video materials especially made for use in second language teaching.

Another area which warrants further attention is learners' understanding of contextual information. In particular, the effect of learners' background knowledge on comprehension of stimulus video materials deserves further investigation. There is some indication from this study that language comprehension varies according to the level of comprehensibility of the visual channel.
The level of comprehensibility of the visual channel is in turn influenced by the subjects' background knowledge of the form and content of the video channel. Further studies could also be carried out to determine the effect of visuals with more proficient SL learners.

5.7 Summary

The purpose of this research was to determine the effectiveness of video as a language teaching aid by obtaining empirical data on NNS comprehension and retention of verbal information presented via audiotape or videotape. More specifically, the study examined the effect of three types of visual formats (picture content) --contained in the video channel--on comprehension of information carried in the audio-verbal channel of television news stories. Of particular interest was the degree of correspondence between information presented simultaneously through the aural and visual channels and the resulting effects on comprehension. A smaller, follow-up study examined the effect of visuals with a group of subjects of higher second-language proficiency.

Nine brief news stories were categorized according to their picture content, identified throughout this study as visual format. The three visual formats under
investigation were: (1) high redundancy (HR): Voice-over-film with high correspondence between verbal and visual content, (2) low redundancy (LR): voice-over-film with low correspondence between verbal and visual content, and (3) talking head: newscaster-only presentation, without film.

The task, developed specifically for the present study, involved audio (sound only) or video (sound + picture) presentation of broadcast news stories containing the visual formats described above. Subjects were randomly assigned to the video or audio presentation. Subjects responded by answering questions on the audio-verbal content of each news story. The amount of information comprehended, measured as the score on the test of cued recall, was obtained for each subject under each presentation mode.

Perceived comprehension was also examined, using a self-report measure. The amount of perceived comprehension was obtained for each subject under each presentation mode. Subjects in the video mode were also asked to rank the news stories in terms of difficulty.

Previous chapters provide background to the problem, a review of pertinent literature and explanation of terminology and description of the research design and procedures involved in the present study.
The results indicate that, under the conditions of the present study, subjects scored significantly higher when news stories were presented via the video mode. Also, significant differences were found between language comprehension scores for each of the three visual formats. As predicted, the highest scores were obtained for the HR format and lowest for the TH format.

Results also suggested that subjects in the video condition perceived television as being easier to understand. Subjects in the video condition rated HR stories as the easiest to understand. From the results of the follow-up study, it appears that the comprehension-facilitating effects of visuals is not as strong for subjects of higher proficiency. In light of the results of the main study and follow-up study, some of the larger claims made on behalf of the video medium should be approached with caution.

The results briefly summarized above were discussed in greater detail in chapter five. Additional information pertaining to some of the materials and procedures is contained in the Appendices.
REFERENCES


STORY ONE: WEATHER: HR

INTRO: AND EVEN VANCOUVER ISLAND, CANADA'S REFUGE FROM THE COLD, IS SHIVERING IN THE DEEPFREEZE.

VOICEOVER: IT WAS SO COLD IN VICTORIA THE LEGISLATURE'S FOUNTAIN STOPPED GURGLING FOR THE FIRST TIME IN A LONG TIME. IT WAS SO COLD THEY WERE COVERING THE PALM TREES. THE NORMAL LOW HERE IS ZERO. LAST NIGHT IT WAS MINUS ELEVEN. SCARVES GLOVES AND COATS NOT USED IN YEARS WERE PUT TO THE TEST TODAY. THEY EVEN HAD THE SHOVELS OUT IN NANAIMO, WHERE OVER THIRTY CENTIMETRES OF SNOW HAD FALLEN. MOTORISTS WERE ADVISED TO STAY OFF THE ROADS. THE AIRPORT AT NANAIMO WAS CLOSED FROM NINE LAST NIGHT UNTIL TEN THIS MORNING AND JUST BEFORE AIRTIME THEY WERE TALKING ABOUT CLOSING IT DOWN AGAIN.
STORY TWO: CHEMICAL SPILL: LR

INTRO: RESIDENTS OF CAMBIE STREET NEAR TWENTY-SEVENTH CAN BE FORGIVEN IF THEY THOUGHT THEIR STREET WAS BEING USED TO SHOOT A REMAKE OF THE WAR OF THE WORLDS THIS MORNING.

VOICEOVER: FIREFIGHTERS DONNED PROTECTIVE GEAR USED FOR CHEMICAL SPILLS AFTER RESPONDING TO A CALL THAT TOXIC FUMES WERE LEAKING FROM A TRUCK. POLICE CLOSED OFF AN EIGHT BLOCK AREA BUT QUICKLY DISCOVERED THE SITUATION WASN'T SERIOUS. JUST LOOSE LIDS ON FIVE CONTAINERS OF CHEMICALS USED IN PHOTOGRAPHIC PROCESSING. THE DRIVER OF THE COURIER VAN CARRYING THE CHEMICALS MANAGED TO STOP BEFORE BEING OVERCOME BY THE FUMES. HE WAS CHECKED AT VANCOUVER GENERAL HOSPITAL AND IS OKAY. FIRE OFFICIALS SAY THEY'RE BEING CALLED MORE OFTEN TO INCIDENTS INVOLVING CHEMICALS AS PEOPLE BECOME MORE AWARE OF THEIR POTENTIAL DANGER.
STORY THREE: HIKERS FOUND:  TH

FOUR HIKERS WERE FOUND EARLY THIS MORNING IN A PROVINCIAL PARK NEAR MAPLE RIDGE. COLD BUT IN GOOD CONDITION AFTER A NIGHT OUTDOORS. THE FOUR MEN WERE REPORTED MISSING YESTERDAY WHEN THEY FAILED TO SHOW UP AFTER A HIKE IN GOLDEN EARS PARK. RCMP AND VOLUNTEER SEARCHERS LOCATED THE MEN SHORTLY AFTER A SEARCH BEGAN AT DAYBREAK.
STORY FOUR: NABET NEGOTIATIONS: (LR)

INTRO: NEGOTIATIONS WILL RESUME TOMORROW BETWEEN CBC AND ITS 2200 NABET TECHNICIANS. THE UNION IS IN A POSITION TO STRIKE TOMORROW AND THE SINGLE OUTSTANDING ISSUE IS MONEY.

VOICEOVER: THE DECISION TO GO BACK TO THE TABLE CAME AFTER A SIX HOUR MEETING BETWEEN UNION NEGOTIATORS AND CBC MANAGEMENT, INCLUDING PRESIDENT PIERRE JUNEAU. NO ONE WOULD SAY IF THERE HAD BEEN A NEW OFFER. THE CBC HAD BEEN OFFERING 13.29 PERCENT OVER 34 MONTHS. THE TECHNICIANS HAD ASKED FOR ABOUT FIVE AND A HALF PERCENT MORE THAN THAT. PREPARATIONS ARE UNDERWAY AT UNION OFFICES IN CASE OF A STRIKE. THE LAST NABET STRIKE WAS IN 1981 AND LASTED ALMOST FOUR MONTHS.
STORY FIVE: OIL SPILL CLEANUP (TH)

THE VOLUNTEERS CLEANING UP THE MASSIVE OIL SPILL AT LONG BEACH ARE TRYING TO COLLECT ABOUT FIVE HUNDRED DEAD SEA BIRDS. THE VOLUNTEERS WILL BE JOINED BY A PRIVATE CONTRACTOR TOMORROW. ONCE THE DEAD BIRDS HAVE BEEN PICKED UP THE NEXT STEP WILL BE CLEANING UP THE OIL ITSELF. AND THAT COULD TAKE UP TO TWO WEEKS.
INTRO: THE POPE'S WEEKLY AUDIENCE AT THE VATICAN WAS INTERRUPTED TODAY BY A MAN FROM LONDON, ENGLAND CLAIMING TO BE THE MESSIAH.

NEWFOUNDLAND IS LOSING ITS SECOND POLITICAL LEADER IN FIVE DAYS. NDP LEADER PETER FENWICK SAYS HE'S JUST SEEN TOO MANY MARRIAGES RUINED BY POLITICS. AND HE DOESN'T WANT IT TO HAPPEN TO HIM. FENWICK, FROM LABRADOR, IS ONE OF TWO NDP MEMBERS IN NEWFOUNDLAND'S LEGISLATURE. HE BECAME PARTY LEADER IN 1981. HE'LL STAY ON UNTIL A CONVENTION PICKS A SUCCESSOR. LAST SATURDAY, PREMIER BRIAN PECKFORD ANNOUNCED HE'LL BE STEPPING DOWN AS CONSERVATIVE CANDIDATE. AN ELECTION IS EXPECTED IN NEWFOUNDLAND THIS YEAR.
STORY EIGHT: NEW BUSES (HR)

INTRO: IF YOU HAVE EVER WAITED FOR A TRANSIT BUS ON A COLD STREET CORNER, HERE'S SOME NEWS THAT MIGHT WARM YOU A BIT. THE BC TRANSIT BUS FLEET IS EXPANDING THIS YEAR. TERRY DOLMAN REPORTS:

VOICEOVER: PRESSURE ON THE TRANSIT SYSTEM HAS BEEN RAPIDLY RISING, CAUSING MOUNTING COMPLAINTS FROM THE BUS RIDING PUBLIC. TRANSIT OFFICIALS SAY THAT THE PRESSURE IS THE RESULT OF POPULATION GROWTH AND INCREASED TRAFFIC FLOWS. BUT THEY SAY THAT HELP IS ON THE WAY. THE GREATER VANCOUVER SYSTEM WILL GET 85 NEW BUSES THIS YEAR. THIRTY FIVE WILL BE DELIVERED THIS SPRING AND FIFTY MORE BY YEAR'S END. GREATER VICTORIA WILL GET TWELVE OF THE NEW BUSES. AND THERE'S GOOD NEWS TOO FOR THE DISABLED. THIRTY ONE NEW HANDYDART VANS ARE BEING PURCHASED FOR SERVICE IN THE GREATER VANCOUVER REGION. THEY'LL ALSO BE USED BY SCHOOL CHILDREN WITH SPECIAL NEEDS.
STORY NINE: CRIME IN VANCOUVER (LR)

INTRO: AND THERE WAS A VICIOUS STABBING INCIDENT EARLIER TODAY.

VOICEOVER: IT HAPPENED INSIDE THIS DOWNTOWN RESTAURANT ABOUT SEVEN THIRTY THIS MORNING. A FORTY YEAR OLD VANCOUVER MAN IS STILL CLINGING TO LIFE IN HOSPITAL. POLICE SAY EUGENE CULLINARE WAS STABBED IN THE STOMACH DURING AN ARGUMENT OVER A SEVENTEEN DOLLAR DEBT. TWO MEN APPROACHED CULLINARE WHILE HE WAS HAVING BREAKFAST. ONE MAN STABBED HIM, THEN RAN AWAY. APPARENTLY MOST OF THE DINERS WERE UNCONCERNED ABOUT ALL OF THIS. THEY SIPPED COFFEE, IGNORING THE COMMOTION AS AMBULANCE ATTENDANTS WORKED ON THE INJURED MAN. POLICE ARE STILL LOOKING FOR A SUSPECT.
Appendix B

CUED TEST OF RECALL COMPREHENSION

TREATMENT CONDITION: AUDIO

VIDEO

STORY # __________

After you've watched or listened to the news story, write down as many details from the story as you can remember. Use the following questions to help you remember.

WHO IS THIS STORY ABOUT?

WHAT IS THIS STORY ABOUT?

WHERE DID THIS STORY HAPPEN?

OTHER INFORMATION YOU HEARD IN THIS STORY?

What percentage of this news story do you think you understood? Indicate the amount by putting a cross: "X" on the scale below:

NOTHING 10 20 30 40 50 60 70 80 90 EVERYTHING
Appendix C

Here is a list of all the stories that you just heard. Show how easy or how difficult you found the stories by putting a cross: 'X' on the scale below.

1 = VERY DIFFICULT TO UNDERSTAND  
10 = VERY EASY TO UNDERSTAND

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