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By

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ABSTRACT

THE EFFECT OF REDUNDANT ACTUALITIES ON RECALL OF RADIO NEWS

By

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Research on broadcast news recall has repeatedly indicated that much of what is presented seems to be quickly forgotten. Evidence from this research suggested that information under certain conditions of presentation was not retained because of the presentation techniques being used. Research on the effect of additional audio stimuli on radio news recall presented conflicting results, suggesting that the presence of such additional stimuli might produce a negative effect on recall. Other research suggested that including redundancy in a radio news story in the form of additional verbal information enhanced recall.

The purpose of the present study was to examine the effects of presenting redundant auditory information on the recall of radio news.

A mixed model 2 (Story Type) X 2 (Repetition) X 2 (Distraction) factorial design was used to test 15 hypotheses. The within subjects factor was Story Type. The between subjects factors were Repetition and Distraction. Subjects used in the present study (N = 192) included both undergraduate college students and non-college students. All subjects were paid $10 for their participation. The subjects were self-selected to one of eight treatment groups.

After listening to a plausible, but fictitious newscast, subjects were asked to identify any of 6 story slugs they recalled from the newscast, to recall four pieces of information about the target story, and to rate the target news story on ten 7-point bipolar scales measuring its appeal.

Six of 15 hypotheses were supported, 2 were partially supported, and 7 were not supported. The results indicate that redundancy in the form of repeating information within a radio news story improved the recall of that information in both newscaster-delivered stories and stories with actualities, but did not improve the recall of the target story slug or the appeal of the news story.

The results also indicate that, contrary to the hypotheses, including an actuality improved recall of the target story slug, but did not improve recall of story information or the appeal of the target story. And the results indicate that incorporating distraction in terms of a secondary task in experiments has an effect on radio news recall, and on the appeal of the news story.

To Anne and Baxter, my two firsts

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CHAPTER I

INTRODUCTION AND JUSTIFICATION

Development of the Problem

Although the claim that most Americans get their news from television and radio may be met with justifiable skepticism, few would seriously doubt that broadcast news is part of a common information base. However, research on recall of broadcast news has repeatedly indicated that much of what is presented seems to be quickly forgotten (e.g., DeFleur, Davenport, Cronin & DeFleur, 1992; Gunter, Furham, & Gietson, 1984; Dommermuth, 1974; Wilson, 1974).

There are many explanations for poor learning, ranging from faulty learning measures (Berry, 1983b) to news story content that does not fit viewer interest or previous knowledge (Gunter, 1987) to the production variables that are used to convey information (Davis & Robinson, 1986). Added to these are environmental factors, such as preparing dinner or even reading the newspaper (Levy, 1978).

Although some or all of these elements interact to produce low learning scores on tests, production variables deserve special attention. Before most other variables can have their effect, the memory code we think of as "the story" must be formed through the integration of the

presented auditory and/or visual information and the previous knowledge brought to the story by the viewer or listener. Evidence from research on broadcast news recall suggests that information may not be successfully integrated into short-term memory because of interference caused by the presentation techniques being used.

Most cognitive psychologists accept the assumption that the human information-processing system has limited capacity, although there is disagreement about the nature of that bottleneck. One position holds that people can divide attention among different stimuli up to the capacity of the system at a particular processing stage (Kahneman, 1973; Shiffrin & Schneider, 1977). The division of attention depends, among other things, on the nature of the stimuli and the nature of the cognitive task at hand (Wickens, 1984).

A number of studies about TV news recall suggest that additional visual information can enhance recall of auditory information when the information is redundant (Drew & Grimes, 1987; Grimes, 1991; Reese, 1984). The more redundancy between the two channels, the higher the recall.

A similar phenomenon may occur when actualities (the actual voices of newsmakers and witnesses to events) are used in radio newscasts. Just as non-redundant visuals can interfere with the recall of auditory information presented in television news, non-redundant actualities may disrupt listeners' information processing through information overload. And just as

redundant visuals enhance recall of auditory information in television, redundant actualities might also enhance recall of information contained in the copy read by the newscaster. It also seems plausible that merely repeating auditory information in a news story may enhance the recall of that information.

It is the purpose of this study to examine the effects of presenting redundant auditory information on the recall of radio news.

Justification of the Study

Survey findings indicating people recall very little information from broadcast news are very disturbing to broadcast journalists as well as to critics concerned about the functions of the news media in our democracy. In fact, they pose a serious and much-debated dilemma. On one side is the fact that the airwaves are still owned by the people, and their use is by license. Policies change from time-to-time, but there is a long-term mandate that our news media serve citizens by keeping them informed. If the public is not being informed by what broadcasters are doing, a day of reckoning and accountability may come, and the rules for broadcast station licensing may change. The other side of the dilemma is that there is also a requirement in our society that our privately-owned media show a profit. Indeed, if such profits were to vanish, our broadcast news media could not survive. Alternatives, such as having government-operated news media, are not acceptable to the majority of our citizens. Thus, the clash between the

traditional function of the "press" in a democratic society and the inescapable need for "profits" is of serious concern for broadcasters, their critics and indeed all citizens.

Therefore, it is necessary for researchers to study, test, and possibly develop production formats that will make broadcast news stories interesting so as to attract an audience and at the same time make it possible for that audience to learn as much as they can.

Radio news holds a unique position in an individual's media behavior. In cars and offices and stores, nearly everyone turns to radio for news at times of disasters and historic events. Radio has a long tradition of bringing fast-breaking headlines to listeners more quickly than other media. As Pease and Dennis (1995) point out, there are 5.6 radios for every American home, and 96 percent of U.S. adults listen to three hours of radio or more every day.

News production is a critical portion of the work done in a typical news radio station. Most radio news organizations devote a great deal of time, effort, and expense to the gathering, production, and airing of actualities. But if the radio newscast is confusing or unpleasant to the ear, listeners will likely tune out the newscast and the time, effort, and expense involved in producing the newscast will be wasted. With stereo remote controls and pre-set buttons on radios, especially in automobiles, the listener can, and often does change stations instantly if undesired or ineffective programming is broadcast. And a newscast without listeners will cease to

exist because advertising revenue is based in large part on the size of the audience. So preventing such channel-hopping is vital to the financial health of a radio station and to listeners.

It is also widely assumed among broadcast journalists and educators that the appeal of radio news can be enhanced by the inclusion of actualities. Additional sound elements, such as actualities or the natural sound from an on-scene report, add to the variety and maximize the impact of the radio newscast (Grady, 1987; O'Donnell, Benoit, & Hausman, 1995). But Robinson and Levy (1988, p. 16) point out that the techniques of presenting broadcast news, including the use of actualities, did not result from systematic study of the processing and comprehension abilities of the audience, but rather evolved by trial and error.

Therefore, research on the effectiveness of actualities in information recall will be useful to the radio news industry. If it is determined that actualities cause confusion among listeners and interfere with information recall then radio news organizations could reduce the use of actualities saving the time, effort, and expense involved in their production. Also, if it is determined that making a change in how actualities are used, such as for providing redundant information, enhances information recall in listeners, then radio news organizations could adopt these new techniques and perhaps improve listenership as well as put limited resources to better use.

And this research will be useful to television news organizations in that many television news stories include actualities (more often referred to

as soundbites in television). Such stories are analogous to radio news stories with actualities in that information is presented by two (or more) individuals and the audience member must mentally "shift gears" between the news reporter and the news maker, both of whom may be presenting different aspects of the same story. Television news organizations also seek to attract audiences to make a profit, and devote a great deal of time, effort, and expense to such efforts.

Communication and journalism educators may also benefit from this research because they help prepare and train future broadcast journalists. Broadcast journalism education stresses the presentation of news in ways that presumably will insure that the news will be communicated to the general mass public. Most textbooks and educators encourage the use of actualities to add variety, pace, excitement, proximity and believability to a radio newscast (Bittner, 1981; Gibson, 1991; Hausman, 1992). Therefore, data about the effectiveness of actualities and techniques to improve that effectiveness will help provide better training for future broadcast journalists.

Objectives of the Study

Radio actualities and television soundbites typically present information not found elsewhere in the news story, and previous research on the use of actualities has typically followed this pattern. Other research has examined the effects of presenting visual information which is

redundant to the auditory information in a television news story. The present study will attempt to include both techniques by examining the recall of radio news stories under various conditions of the use of actualities and redundant information.

Previous research about the effects of actualities in radio news stories has rarely attempted to present such stories in a realistic environment with varying levels of distraction. In reality, most audience members listen to the radio while also attending to some other task, such as driving a car, preparing a meal, or dressing for work. Attention to the radio newscast will be divided because of such activities which might also affect the recall of information presented. In such cases there is no opportunity to "go back" in the newscast and rehear the portions unnoticed or not fully understood. The listener only has one chance. So the present study will examine recall of radio news stories under various conditions of distraction.

And because the present study is using new techniques in presenting radio news information, it will also attempt to measure the listeners' perceptions of stories presented under these conditions in terms of such things as ease of understanding, interest, and informativeness. This is important because listeners may also tune out stories which are boring or difficult to understand, and a poorly presented message may have trouble getting through to the listener in the first place. Providing redundancy within a news story by repeating information may interfere with listeners' processing because the story may seem boring or overly simple.

CHAPTER II

LITERATURE REVIEW AND HYPOTHESES

Radio News Research

The public consistently tells survey takers that radio and television are very important sources of news (Roper, 1981; PR Newswire, 1996). The audience listens to radio and watches television not only for the latest and most immediate information but also because they can see and hear the people involved in the news and because they trust in the personal delivery of newscasters (Hewitt, 1995, p. 2).

Researchers have found that most of the radio audience are doing something else while these newscasts are on the air. Compared to other activities, listening to and processing news has a low priority. Divided attention, in most cases, sharply restricts the ability to absorb and remember information. Graber (1988) found that participants in her study of political information processing most frequently attributed missing a news story because of casual inattentiveness (p. 99). Therefore, a radio news story must attract the attention and maintain the interest of the listener in order for the information contained in the story to be processed.

Broadcast journalism educators and radio news professionals emphasize the use actualities and natural sound within radio news stories.

They suggest these elements attract and hold listeners by helping them to participate vicariously in news events by taking them to the scenes of such events and allowing them to hear the actual voices of newsmakers (Herbert, 1976; Shook & Lattimore, 1987). Radio news uses supplementary voices and natural sounds to enhance interest and create images in the minds of listeners (Mayeux, 1991; Stephens, 1993). Gibson (1991) claims "changes in voices. . .help reinforce the attention of listeners..." (p. 179). In addition, actualities and natural sound can add variety, interest, pace, drama, excitement, and credibility to a newscast (Fang, 1980; Hausman, 1992; Stephens, 1993).

However, these uses may do more to satisfy norms of journalistic presentation than help the audience comprehend and remember the news. Their use seems based more on tradition than empirical research. Hall (1986) refers to how war coverage sparked up-to-date reports, on-the-spot reports and live interviews. Charnely (1948) noted the extensive use of radio news actualities early on by WMAQ in Chicago. He encourages the practice of preparing these audio elements and inserting them into newscasts. In a more recent content analysis of network radio newscasts, Burriss (1988) found 47% of sample stories used additional audio material to present information. Actualities were the most common form of presentation (61%).

Despite the belief that they make a news story more interesting, using actualities and natural sound may disrupt listeners' information processing

causing a loss in information uptake through information overload. The problem may be compounded in many radio news stories by the use of short actualities, some lasting less than 10 seconds. This may be too short a period for the listener to adjust to the new voice, resulting in a complete loss of information presented within the actuality. What little research exists on the effect of additional audio stimuli on recall of radio news provides some support for this notion.

Wulfemeyer and McFadden (1985) found that the presence of actualities had a negative effect on recall. In their study, college students who listened to a 3 1/2-minute simulated radio newscast that had no actualities scored significantly higher on a multiple-choice test of recall than did students who listened to a newscast that did contain actualities. Somewhat surprisingly, the students also rated the newscast without actualities as more interesting than the newscast with actualities, which goes against one of the reasons broadcast journalism professionals use actualities, namely that of maintaining listener interest.

On the other hand, Grady (1987) used similar methods to Wulfemeyer and McFadden, but obtained contradictory results. Grady hypothesized there would be significant differences in the recall of information contained in a radio news story in one of four treatment modes. Like Wulfemeyer and McFadden, Grady's newscast contained five stories and was of similar length in time (3 3/4-minutes). But only one story varied from treatment to treatment, variously produced in the form of a voice report with no

background sound, a voice report with relevant background sound, a story with an actuality, and a straight news story read by the same voice as the other stories. Grady found no significant differences in recall of facts contained in the treatment story or in the general appeal (interest) of the treatment story. Both Grady and Wulfemeyer and McFadden used samples from the homogeneous population of undergraduate college students as subjects, used treatment stories lasting less than one minute, and presented the newscasts in a classroom setting.

Building on these two studies, Clugston (1992) examined the effect of dramatic (filled with emotion and urgency) versus non-dramatic (less energetic and relatively unemotional) actualities on information recall. He also used undergraduate college students as subjects, used treatment stories lasting less than one minute, and presented the newscasts in a classroom setting. He found little difference in information recall between those who listened to a news story with a dramatic actuality and those who listened to a news story with a non-dramatic actuality. However, subjects who listened to the dramatic actuality ranked the newscast as more credible and with a higher degree of professional ability and integrity than did subjects who listened to the non-dramatic actuality.

Following a different line of reasoning, Findahl and Hoijer (1975) focused on the effect of additional verbal information on the recall of radio news information. They reasoned that amplifying a standard radio news story with additional background information or expanding the story by

repetition of one or more portions of its content would result in increased comprehension and recall of information contained in the story. The researchers presented radio news stories with no actualities, but containing varying degrees of additional verbal information to subjects ranging in age from 15 to 65 and with varying degrees of education. The target stories contained a brief description of a fictitious news event and information as to the location, the principals involved, the causes and effects of the event. These stories were then filled out with additional information by repeating one or more of the aspects a couple of times.

The researchers found the additional repeated verbal information made it easier to recall the content of the stories. Listeners hearing the basic story with no verbal supplements exhibited the lowest scores. Retention was best for stories which contained additional verbal information on all aspects of content and for those in which the additional verbal information concerned effects of the event. But the authors stress that it is not just the amount of additional verbal information but also the nature of the information repeated which is of significance for retention. It appears to be important to repeat information that may be difficult to process on one hearing, such as location names and the names of those involved in the event. The authors conclude that stressing this information serves to tie together the news story and provide a framework for the listeners cognitive organization of the content of the story.

It thus appears that redundancy, in the form of repetition, may have

an effect on the ability to recall radio news information. It seems plausible that actualities could enhance recall if they repeated information contained in the written copy. Some support for this notion is found in research on the effect of audio-video redundancy on information recall.

Audio-Video Redundancy Research

Research on how people learn from television has grappled for years with the question of whether redundant audio and video channels help people learn from television. Jorgensen (1955) conducted an early study in which he found no significant difference in information gain when comparing a newscaster alone and a newscaster speaking over film. He found, however, that film produced significantly more information gain than did the newscaster who accompanied still pictures.

Other early researchers in this area defined audio-video redundancy in terms of Shannon & Weaver's information theory (1949). For example, Hsia (1971) defined audio-video redundancy as the ratio of identical information between the audio and video channels (p. 54). This view held that the more redundant the two channels, the less information would be lost; more redundant messages would have a greater chance of communicating. Hsia (1971) also suggests that audio and video redundancy might actually increase the capacity of the information processing system.

In their review of educational media research, Chu and Schramm (1967) concluded that the use of visuals will improve learning from audio-

visual messages where it contributes to the information contained in the audio track; otherwise, visual images may actually distract and interfere with learning. A formal embodiment of this position, the cue summation theory, was put forward by Severin (1967, 1968) who hypothesized that when you add pictures to the message, you increase the number of cues relevant to the message. If the pictorial cues are redundant with the audio message, then viewers will more likely remember the message. But presentation of irrelevant cues in either the visual or audio channels will cause a loss of learning from the other channel.

Other researchers have approached the topic from the theoretical perspective that audio-video redundancy is harmful to memory. They propose a distracting hypothesis, arguing that visuals distract viewers from the audio channel, which is where the facts are. Singer (1980) argues that inherent in the power of television to attract viewers lies its limitations as an information medium. He refers to television commercials when illustrating how cognitive overload can occur when watching television. The parallel presentation of information in both aural and visual channels may be simply too much for audience members to deal with.

Gunter (1980) conducted an experimental study in which nine television news stories were presented to 60 college students under three different visual format conditions: newscaster-only presentations, newscaster-plus-film, or newscaster-plus-stills. Three versions of each story were prepared, and three different sequences of news story order were

produced so that each subject was presented with all three visual format conditions. The results indicated that individuals viewing a televised news story accompanied by film footage or by still pictures gave fewer correct answers to questions about story narrative content than when they viewed the same items presented by the newscaster only against a plain studio background. Gunter concluded that the visual material impaired retention of detailed information.

In a further analysis of Gunter's (1980) findings, Berry (1983a) found that film material enhanced learning from a particular part of the news story rather than across the story as a whole. Berry (1983a) presented serial learning curves for responses to questions asked by Gunter (1980) that probed narrative information that coincided with pictures in the film and still-accompaniment treatments, and for responses to questions that probed content during the "talking head" lead-in phase common to all items in all three experimental conditions. His analysis indicates that moving film can interfere with the uptake of narrative content presented at the same time. Berry suggests that this effect may be a consequence of too much information being presented at once or from a mismatch of incompatibility of the learning processes required to deal with simultaneously presented and mutually nonreinforcing or nonrelevant visual and verbal material. Such results lend further support for the hypothesis that redundant visuals will enhance retention of aural information, but nonredundant visuals will distract the viewer and interfere with the processing of aural information.

In a study of the effects of visuals on learning from news stories, Reese (1984) manipulated the degree of redundancy between pictures and narrative. He used news stories recorded off-air and reedited them to produce several treatment conditions, including both audio-video redundant and nonredundant versions. He also added a third element, a printed caption representing a complete transcription of the news story. He used multiple choice questions to measure how much each subject remembered from the newscast.

Results showed that, overall, redundant pictures and words enhanced learning, while there was some evidence that adding redundant print information either had no effect or detracted from learning. The Reese study indicated that viewers can effectively process redundant information through the audio and video channels, but learning drops off when they must also process captioned print information. This additional input appears to divide attention excessively such that, although the contents of these different channels are redundant, information processing becomes less effective.

Drew and Grimes (1987) also examined the effect of audio-video redundancy on TV news recall, but measured visual recall in addition to auditory recall. They used a series of 15-second long voice-over-video stories whose short length permitted a closer relationship between the information in the two channels than would be possible with longer stories. Video was used from evening newscasts, but scripts were written

specifically for the experiment so that the video would match the audio as closely as possible. Five newscasts were produced ranging from high redundancy in which all stories had redundant audio and video to low redundancy with video that did not match the audio in any of the stories. Two other conditions were created to provide baseline measures for single-channel recall. The audio from the high-redundancy newscast was played to one group and the video from the high-redundancy condition was shown to another. A total of 82 undergraduate journalism majors participated in the experiment, with 13 to 18 subjects per condition.

The results show higher auditory recall in the high-redundancy condition than in the lower redundancy condition. However, visual recall showed the reverse pattern with higher recall scores in the lower redundancy conditions than in the high-redundancy condition. Drew and Grimes say the data indicate that when watching redundant television news stories, viewers focused most attention on the audio while still attending to the video. But when there is conflict between the audio and video viewers attend to the video at the expense of the audio (p. 459).

Other researchers have taken a different approach to studying the effect of redundancy on TV news recall, operationalizing redundancy as repetition of important elements of a news story. Perloff, Wartella, and Becker (1982) predicted that recall would increase when newscasts recap important elements of each news story. They found that several sentences recapping the news stories at the end of a newscast enhanced viewers'

recall of story content. They suggested that recaps should be used in conjunction with other techniques to improve learning.

Similarly, Bernard and Coldevin (1985) investigated the effects of short, headline type recaps on the recall of specific information and knowledge of the "gist" of the stories in a television news program. They found that recaps increased retention of the gist of the stories, but did not affect retention of specific details. They did not find any difference between oral recap and oral-plus-graphic recap, and concluded that recapping is a simple and effective technique for directing postviewing attention toward particular news program content.

Son, Reese and Davie (1987) combined approaches and examined the effects of audio-video redundancy as well as repetition on TV news recall and understanding. They used stories from network newscasts selected based on how well the visual and audio channels matched and how well the stories were known. Selected stories had high audio-video redundancy but were on topics which were not well known. All subjects in the experiment saw the same news content. Eighty undergraduate students were randomly assigned to one of four treatment conditions: 1) redundant pictures and words with recaps; 2) redundant pictures and words without recaps; 3) nonredundant pictures and words with recaps; and 4) nonredundant pictures and words without recaps. The nonredundant versions were created by reediting the video in a news story so that it did not match the audio. Recall was measured by asking multiple choice questions about each story.

Understanding was measured by asking open-ended questions about the central points of the stories.

The results indicated that redundancy between pictures and words significantly improved recall of television news stories, but not story understanding. The results also showed that recaps significantly improved story understanding, but not more general recall. The results also suggested an interaction between recapping and redundancy such that the presence of recapping helped mitigate the absence of audio-video redundancy. The overall results of their experiment indicate that some form of redundancy, whether between the audio and video channels or through repeating of information, enhances learning from TV news.

Prior Research Applied to the Present Study

A basic assumption guiding the current study is that the capacity to absorb material is limited and that once that limit is reached, information overload, or a lack of capacity to absorb new material, will occur (Broadbent, 1958; Posner, 1982). Such an assumption has been normally applied to research on the effects of audio-video redundancy on information recall. This research, as noted above, tested the idea that discordant messages would compete for cognitive attention and overload the cognitive processing of the information being presented. But when the audio and video channels were redundant, the cognitive system is not overloaded and learning is enhanced, in part because the one channel reinforced the other.

Nonredundant channels compete for the attention of the audience member resulting in unequal distribution of attentional resources as the cognitive system attempts to filter out interfering messages. In TV news viewing, the most useful channel seems to be the narration. This may be because TV news producers intentionally place the central message on a news story in the narration (Fang, 1980; Stephens, 1993; Yoakam & Cremer, 1985). Indeed, some evidence suggests that viewers manifest a bias toward the narration (Drew & Grimes, 1987; Grimes, 1990; Reese, 1984).

In effect, this research shows that stimuli from a secondary source competes with the primary channel being attended to and creates interference in the cognitive processing of information being received from the primary channel. Although the intrachannel inconsistency found in television news research may not have the same impact an interchannel inconsistency, such an effect might also occur in a single-channel presentation like a radio news story, when background audio is added or when the presentation switches from the news reporter's voice to a news maker's voice, as in an actuality. In such cases, the actuality serves as interference with the "conversation" the news reporter has with listeners. Such disruptions in information processing have been found to inhibit recall, because it takes time for the listener to adjust to the new voice (Bugelski, 1979; Kahneman, 1973). During such time, known as switching time or switching rate, information processing ceases briefly as the mind switches

between inputs (Moray, 1969).

It also seems plausible that listeners' attention may be divided even when a radio story does not contain an actuality because most listeners engage in a secondary task while listening to the radio. Previous published research about broadcast news recall has failed to incorporate a secondary task to provide a more realistic setting for the research experiment.

Demographic Variables and Cognitive Processing

Both gender and age are known to interact with media use (Gunter, 1985). Patterns of media use, interest in the news, and utility of information often show marked variations between genders. Furthermore, there is psychological evidence of age differences and to some extent of gender differences in cognitive information-processing abilities relating to acquisition and retention of linguistic material, although the findings relating to gender differences are not as clear (Goleman, 1978; Gunter, 1987; and Maccoby & Jacklin, 1974).

Although for a long time identified as significant predictors of knowledge gain from the mass media, the predictive value of education and socio-economic status has recently been challenged. There may be considerable variation in mean learning scores from broadcast news media, even among common high ability groups (Berry, 1983b; Gunter, 1987).

Reserach Hypotheses

The above research suggests that actualities may interfere with cognitive processing of radio news information, resulting in lower information recall and a perception of an unappealing story. It also suggests that redundancy, in the form of repeated information, can enhance recall of news story information by allowing the listener to hear the information more than once in the same news story, which could also make for a more appealing story because the listener will understand it better. The research also suggests that a secondary task will distract the listener from a radio news story, inhibiting story information recall, and creating the perception of a less appealing story. Finally, there are mixed findings regarding the effects of demographic variables such as gender and age on information recall, but prior research has noted age and gender differences in media use and interest in the news, suggesting news stories may be more appealing to some groups than others.

Therefore, the present study will test the following hypotheses:

H1: The target story slug* will be recalled more frequently when the story contains repetition (repeated information) than when it does not.

H2: The target story slug will be recalled more frequently when the story doesn't contain an actuality than when it does contain an actuality.

H3: The target story slug will be recalled more frequently when the story contains an actuality with repetition than when it contains an actuality without repetition.

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*For purposes of the study, a radio news story slug is defined as a short name or title used to describe the news story.

H4: The target story slug will be recalled more frequently when subjects are not engaged in a distracting activity than when subjects are so engaged.

H5: Recall of target story information will be significantly greater in stories without actualities than in stories with actualities.

H6: Recall of target story information will be significantly greater in stories with repetition than in stories without repetition.

H7: Recall of target story information will be significantly greater when the story contains an actuality with repetition than when it contains an actuality without repetition.

H8: Recall of target story information will be significantly greater in stories heard while not engaged in distracting activities than in stories heard while so engaged.

H9: Radio news stories without actualities will be perceived as significantly more appealing than stories with actualities.

H10: Radio news stories with repetition will be perceived as significantly more appealing than stories without repetition.

H11: Radio news stories with actualities with repetition will be perceived as significantly more appealing than stories with actualities without repetition.

H12: Radio news stories heard while engaged in a distracting activity will be perceived as significantly less appealing than stories heard while not engaged in a distracting activity.

H13: There will be a positive correlation between the appeal of a radio news story and amount of information recalled from it.

H14: There will be no significant difference in radio news story information recall based on gender, education, income, or age.

H15: There will be a significant difference in the appeal of a radio news story based on gender, education, income, or age.

CHAPTER III

METHOD

Design of the Experiment

A mixed model 2 (Story Type) X 2 (Repetition) X 2 (Distraction) factorial design was used to test the hypotheses (Figure 1). The within subjects factor was Story Type. The between subjects factors were Repetition and Distraction. The two levels of Type were Actuality (story included an actuality) and Reader (story did not include an actuality). The two levels of Repetition were Redundant (information was repeated) and Non-Redundant (information was not repeated). The two levels of Distraction were Absent (no purposeful distraction), and Present.

No control group was used because a control group implies no treatment is given to the subjects in that group, and thus the responses are based entirely on chance. This can be determined independently because none of the subjects could have known anything about the fictional material used in the newscast in advance of the experiment. And not using a control group increased the N in each treatment group.

Under the Present distraction condition, subjects were requested to respond to a stimulus inserted periodically into the newscast presented on a television monitor connected to a video cassette recorder. The video

		STORY TYPE			
		Actuality	Reader	Actuality	Reader
		REPETITION			
		Non-Redundant		Redundant	
DISTRACTION	Absent	Group 1	Group 2	Group 3	Group 4
	Present	Group 5	Group 6	Group 7	Group 8

GROUP	1	2	3	4	5	6	7	8
STORY TYPE	Act	Rdr	Act	Rdr	Act	Rdr	Act	Rdr
REDUNDANCY	No	No	Yes	Yes	No	No	Yes	Yes
DISTRACTION	No	No	No	No	Yes	Yes	Yes	Yes

Figure 3.1. The 2 X 2 X 2 factorial design of the experiment.

portion of the video tape simulated driving a car around the local community. The audio portion of the tape contained the recorded newscast. Subjects were asked to watch for a semi-tractor trailer truck passing to the left and flip the switch they each held when they saw the truck pass. This event occurred only once during the newscast during the target story. The switch was attached to a light panel visible only to the investigator, who recorded which subjects reacted to the distraction stimulus and which did not. Subjects in the distraction Absent condition were requested to simply listen to the recorded newscast presented on a portable stereo cassette tape player.

Eight versions of a fictitious newscast were produced. Each

treatment group heard one version. Half of the newscasts were produced with the distraction stimulus. The newscast contained five news stories presented in the same order (actuality, reader, target, actuality, reader) to control for order effects. The target story was presented in the middle of the newscast to control for primacy and recency effects. The newscast consisted of simulated, but conceivable news items of a general nature. All stories were read by an experienced broadcast journalist at the normal rate of presentation. Voices for the actualities were provided by trained voice talent. Fictitious names were used.

Each newscast story contained a brief description of the news "event" and information as to the location, the principals involved, and the causes and effects of the event. In Actuality stories some of this information was contained within the soundbite.

Four versions of the target story were produced (Appendix A). Two versions were produced as Actualities, two as Readers. One Actuality version and one Reader version were produced with Redundancy by repeating parts of the story information. In Actuality versions the repeated information was contained in the soundbite.

The non-target stories were the same for all newscast versions (Appendix B). Two of the non-target stories were actualities, two were not. None of the non-target stories contained redundancy.

All news stories were first submitted to a panel of broadcast educators and professionals who judged them to be an accurate simulation

of the news fare generally found on small and medium market radio stations. In order to promote the program as a realistic example of local radio news, subjects were told that the newscast was from a station in Iowa.

Recruiting Subjects

Subjects used in the present study included both undergraduate college students and non-college students. The subjects were recruited from churches and social organizations (Parent-Teacher Organization, MSU Clerical-Technical Union, etc.) in central Michigan, and mass communication classes at Michigan State University and the University of Evansville, Indiana. All subjects were paid $10 for their participation. The subjects were self-selected to one of eight treatment groups.

A recruitment letter was sent to course instructors and church and social organization leaders. The letter explained the study without detailing the experimental conditions, and provided information regarding payment for participating in the study, when and where the experiment would be conducted, and contact names and phone numbers for information.

Originally, the subjects were to be recruited and then randomly assigned to one of the treatment groups. However, it was not possible to coordinate a schedule to fit the availability of potential subjects. Also, the response to the preliminary call for subjects was far less than anticipated. So a more general recruiting announcement was made with specified times for the experiment to be conducted (Appendix C). Because of this, the

number of subjects participating at any particular time was unknown until the subjects arrived at the experiment site. Typically fewer than a dozen subjects participated at any particular time so that all subjects were assigned to one or two treatment groups for each time period and the treatments were rotated. Thus all subjects might have been assigned to Treatment Group 1 at the first time period, Treatment Group 2 at the second time period, etc. The treatment group assignment was due entirely to when a subject chose to arrive at the experiment site. In order to maintain a comparable number of subjects in each group, the treatment group selection was made after the number of participating subjects was known for a specific time period.

However, even though the selection process was not formally random, there also was no systematic assignment of subjects such that the selection procedure was still likely sufficiently haphazard so that it was "random in effect" (Lord, 1963). Selection differences resulting from the nonrandom assignment may produce posttest differences between the groups even in the absence of a treatment effect. Therefore, the data analysis subsequently controlled for the effects of these differences (Cook & Campbell, 1979, pp. 148-149).

The nonrandom assignment of subjects to groups also raises questions regarding the threats to internal validity of the study which are normally ruled out by randomization (Cook & Campbell, 1979, pp. 51-55). Among these is history, which was controlled for by using a fictitious

newscast and not including a pretest measurement such that none of the subjects could have any knowledge of the information contained in the newscast prior to the experiment.

Maturation, testing, instrumentation, and statistical regression were also controlled for by the lack of a pretest and because all the groups were subject to the same test and experimenter effects. Mortality was not a threat because none of the subjects dropped out of the experiment before it was completed. Causal time-order was not a threat because all groups listened to the newscast before being tested for recall. Compensation, compensatory rivalry, and resentful demoralization were controlled for because all subjects were paid $10 for their participation regardless of which treatment they received.

Diffusion or imitation of treatments was not entirely controlled for because the experiment was conducted at various times over several days so that subjects who had already completed the experiment could have discussed the information in the newscast and/or the treatment they received with other subjects who had not yet completed the experiment. However, subjects were specifically requested not to discuss the experiment with anyone until the end of the month. All subjects in Michigan completed the experiment by the end of July, and all other subjects had completed the experiment by the end of September. Therefore, this threat to internal validity seems remote at best and any possible effects it might have produced were likely insignificant and ultimately statistically controlled for.

Conducting the Experiment

The data were collected during a two-week time period in mid-July and during the first week in September of 1995. Subjects were seated in a university classroom, with seats arranged in a semicircle so all subjects could hear the newscast. Each subject was asked to read and sign an informed consent statement (Appendix D). A trained investigator read a set of instructions (Appendix E) to the subjects who were told they would be asked some sort of question at the end of the newscast, but were not told they would be questioned on what they recalled from the newscast. Those in the Distraction Present groups were also instructed on how to respond to the distraction stimulus. The investigator then played the newscast.

Immediately following the newscast, subjects were given a questionnaire with four parts (Appendix F). The first part consisted of a list of 6 story slugs. Subjects were asked to identify any they recalled from the newscast. Only three of the slugs were taken from stories used in the newscast, including the target story. A second part asked subjects to recall information contained in the target story by answering multiple-choice questions on where the event took place, who or what was involved, what caused the event, and what was the effect of the event.

A third part asked subjects to rate the target story on ten 7-point bipolar scales consisting of the following pairs of opposites: boring-stimulating; easy to understand-hard to understand; unimportant-important; informative-meaningless; hard to follow-easy to follow; interesting-

uninteresting; complicated-simple; repetitious-varied; thorough-superficial; easy to remember-hard to remember. In the fourth part of the questionnaire, subjects were asked to provide basic demographic data on gender, age, education level, and income level.

After collecting the completed questionnaires, the investigator read a debriefing statement (Appendix G). Subjects were told the purpose of the experiment, requested not to discuss the experiment with anyone until after the final data was gathered, and thanked for their participation. The investigator then paid the subjects.

Creating Scores

Subjects were asked to recall four pieces of information about the target story: 1) the city where the story took place, 2) the name of the person identified in the story, 3) why the identified person is against buying a nuclear power plant, and 4) how the city will finance the purchase of the plant. There were five possible answers to each question, including a "don't know" option. A "story information recall score" was calculated for each subject based on whether or not they correctly recalled target story information (correctly recalled = 1 point, incorrectly recalled = 0). A "don't know" answer was counted as incorrect. This score was the total points for each subject on the four items. Thus each subject could have a story information recall score ranging from 0 (incorrectly recalled all four bits of information) to 4 (correctly recalled all story information).

Table 3.1 shows the target story information score frequencies. About one-quarter (26.0%) of the subjects missed all four questions. About the same number answered just one (27.1%) or two (26.0%) questions correctly. Only 6 subjects (3.1%) answered the four questions correctly.

Table 3.1. Story Information Recall Score Frequencies

Score	Frequency	Percent	Cum Percent
0	50	26.0	26.0
1	52	27.1	53.1
2	50	26.0	79.2
3	34	17.1	96.9
4	6	3.1	100.0

X = 1.45 Std Dev = 1.15 Variance = 1.317

Subjects were also asked to rate the target news story on ten 7-point bipolar scales measuring the appeal of the target news story. The scales were coded or recoded before analysis so that 1 was at the low end of the scale and 7 was at the high end. An "appeal score" was created by summing the responses of each subject on the ten bipolar scales. The reliability of this index was determined using Chronbach's Alpha, which is the correlation between the observed score (the subjects' ratings in the experiment) and the true score (what the subjects' ratings would be if

questioned on all possible items in the universe). Alpha is based on the average correlation of items in the index if the items are standardized to a standard deviation of 1, and ranges from 0 to 1. The larger the correlation (the closer to 1) the more reliable the index (Norusis, 1990, pp. B-190-191).

Table 3.2 shows the mean rating and standard deviation for each of the ten bipolar scales. The right column shows the Alpha for the appeal index if the individual bipolar scale were deleted. The standardized item Alpha for the index is 0.90, indicating strong reliability of the index. The individual scale Alphas indicate that eliminating any of the bipolar scales from the index causes little change in Alpha.

Table 3.2. Mean Ratings of Target News Story Appeal

Bipolar Scale	Mean Rating	Standard Deviation	α if item deleted
Boring/Stimulating	2.90	1.41	0.89
Hard/Easy to Understand	4.02	1.97	0.89
Unimportant/Important	4.26	2.00	0.89
Meaningless/Informative	3.81	1.97	0.89
Hard/Easy to Follow	3.81	2.11	0.88
Uninteresting/Interesting	4.03	1.97	0.89
Complicated/Simple	4.03	1.97	0.89
Repetitious/Varied	3.26	2.02	0.89
Superficial/Thorough	3.09	2.03	0.90
Hard/Easy to Remember	3.03	1.99	0.89

Standardized Item Alpha = 0.90

Statistical Techniques Employed

Fifteen hypotheses were stated in the preceding chapter of this report. Evidence intended to provide support for these hypotheses was generated by conducting the experiment as stated above. Several statistical techniques were employed to test the hypotheses. In all instances, the null hypothesis was rejected if the significance level for the statistic was at or below the .05 level.

It must be noted that all of the statistics employed to test the hypotheses require certain assumptions to be met. Most of these assumptions are addressed with the discussion of the individual statistics below. However, one assumption common to all the statistics employed is that the data come from a random sample. As noted earlier in this chapter, this assumption was not technically met. But, as was also noted, even though the process used to select the sample was not formally random, there also was no systematic assignment of subjects such that the selection procedure was still likely sufficiently haphazard so that it was "random in effect" (Lord, 1963). It is also likely that the statistics employed are robust enough to compensate for this lack of formal randomness.

Hypotheses 1 through 4 examine the effect of the three treatment variables (repetition, actuality, and distraction) on subjects' ability to recall the target story slug. Cross-tabulations and chi-square tests were computed to determine if there were significant differences between the cells of the contingency table generated for each hypothesis. These statistics were

appropriate because both the independent and dependent variables were measured at the nominal level (No = 0, Yes = 1), the categories were mutually exclusive (subject did or did not recall the story slug, the treatment was or was not present), and each observation in each category was independent from all others. There were also at least five observations in each category.

Hypotheses 5 through 8 examine the effect of the three treatment variables on subjects' recall of target story information. The t-test was used to determine if there were differences in the mean story information recall scores (see above) for the subjects receiving the treatment condition and for subjects not receiving the treatment condition. The t-test was appropriate because the dependent variable (story information recall score) was measured as an interval scale with a limited range and the independent variable was measured at the nominal level (received or didn't receive treatment).

Hypotheses 9 through 12 examine the effect of the three treatment variables on subjects' rating of the appeal of the target news story. The t-test was used to determine if there were differences in the mean appeal scores (see above) for the subjects receiving the treatment condition and for subjects not receiving the treatment condition. The t-test was appropriate because the dependent variable (story appeal score) was measured at the interval level and the independent variable was measured at the nominal level (received or didn't receive treatment).

Hypothesis 13 examines the relationship between the appeal of a radio news story and amount of information recalled from it. Pearson's correlation coefficient was used because the hypothesis looks for the degree to which two dependent variables (story information recall score and story appeal score) change in relation to one another. A positive correlation means that the two variables increase, or decrease, together.

Hypotheses 14 and 15 examine the relationship between the independent demographic variables and each of two dependent variables, news story information recall, and the appeal of a radio news story. Hierarchical regression was used to test these hypotheses because it allows for control of the order of entry for the independent variables. Hierarchical regression requires that several assumptions be examined.

The first assumption is that there be at least 20 times more cases than independent variables (Tabachnick & Fidell, 1989, pp. 128-129). With 192 subjects and 4 independent variables (gender, education, income, age), the cases-to-IV ratio is 48:1, well above the minimum requirements for regression. There are no missing data.

A second assumption is that the residuals are normally distributed about the predicted dependent variable scores. Figure 3.2 shows the histogram for the standardized residuals for the regression of the demographic variables on story information recall. The residuals are slightly negatively skewed with a slight positive kurtosis. Thus, the assumption of normality may not have been met, although the deviation is very slight.

```
 N Exp N      (* = 1 Cases,     . : = Normal Curve)
 0   .15   Out
 0   .29  3.00
 1   .75  2.67 :
 4  1.71  2.33 *:**
 1  3.50  2.00 *  .
 7  6.42  1.67 *****:*
11 10.53  1.33 **********:
17 15.49  1.00 **************:**
31 20.39   .67 ********************:**********
12 24.05   .33 ************           .
18 25.41   .00 ******************       .
23 24.05  -.33 ************************.
12 20.39  -.67 ************         .
27 15.49 -1.00 **************:************
24 10.53 -1.33 **********:**************
 3  6.42 -1.67 ***   .
 1  3.50 -2.00 *  .
 0  1.71 -2.33  .
 0   .75 -2.67 .
 0   .29 -3.00
 0   .15   Out
```

Figure 3.2. Standardized Residuals Histogram for Regression of Demographic Variables on Story Information Recall.

```
 N Exp N      (* = 1 Cases,     . : = Normal Curve)
 0   .15   Out
 0   .29  3.00
 0   .75  2.67 .
 0  1.71  2.33  .
 0  3.50  2.00    .
 2  6.42  1.67 **   .
12 10.53  1.33 **********:*
18 15.49  1.00 **************:***
22 20.39   .67 ********************:**
43 24.05   .33 ************************:********************
41 25.41   .00 ************************:****************
18 24.05  -.33 ******************     .
 6 20.39  -.67 ******              .
 4 15.49 -1.00 ****           .
 5 10.53 -1.33 *****      .
 4  6.42 -1.67 **** .
 4  3.50 -2.00 ***:
 7  1.71 -2.33 *:*****
 4   .75 -2.67 :***
 2   .29 -3.00 **
 0   .15   Out
```

Figure 3.3. Standardized Residuals Histogram for Regression of Demographic Variables on News Story Appeal.

Figure 3.3 shows the histogram for the standardized residuals for the regression of the demographic variables on news story appeal. The residuals are slightly positively skewed with slight positive kurtosis. Thus, the assumption of normality may not have been met, although the deviation appears to be slight.

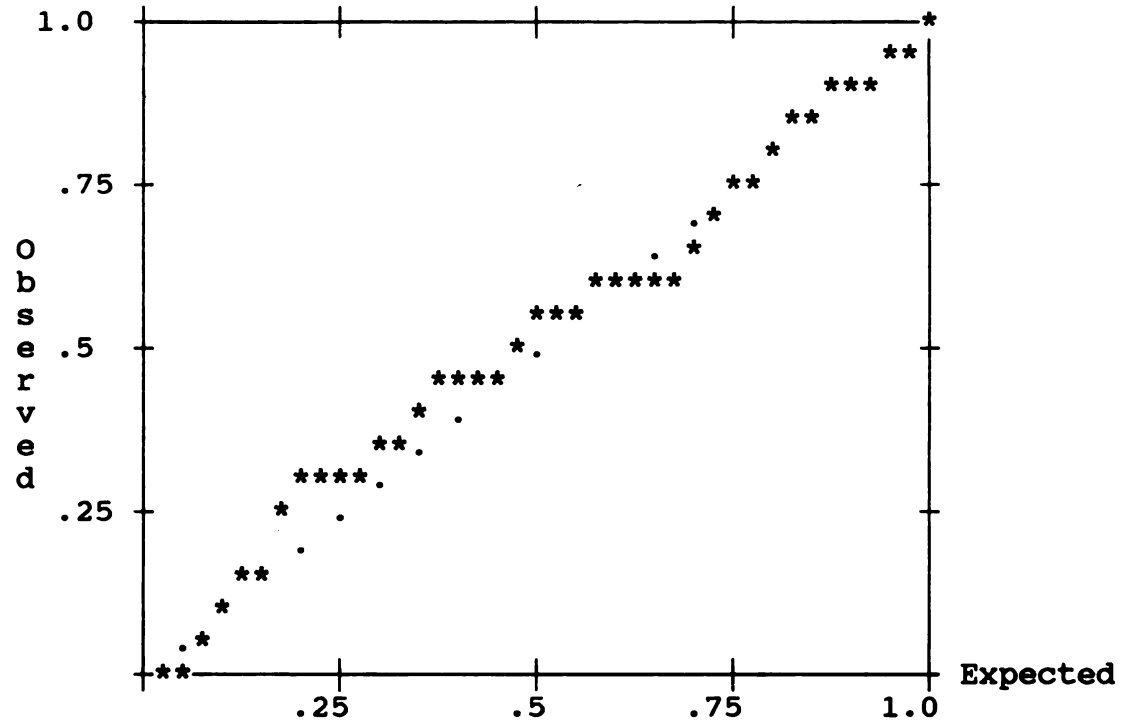

Figure 3.4. Normal Probability Plot of the Standardized Residuals for the Regression of Demographic Variables on Story Information Recall.

A third assumption is that the residuals have a straight line relationship with predicted dependent variable scores (Tabachnick & Fidell, 1989, p. 79). Figure 3.4 shows the normal probability plot of the standardized residuals for the regression of the demographic variables on story information recall. The standardized residuals generally run along the normal probability line, and the assumption of linearity has been met.

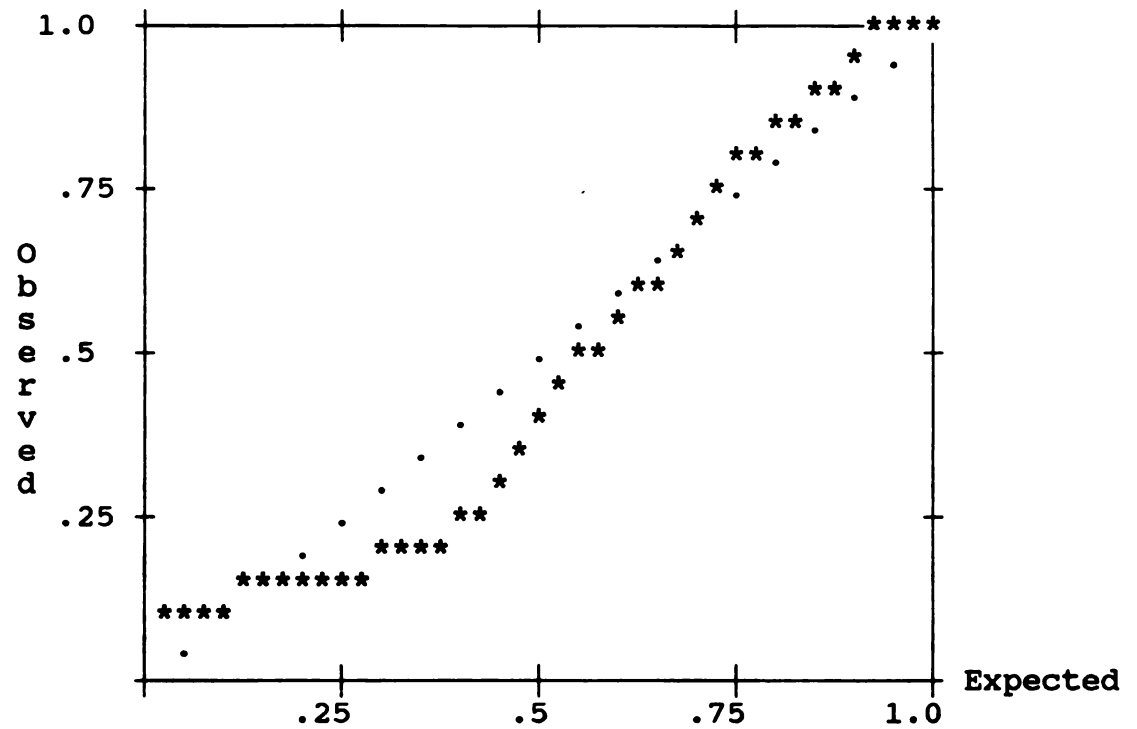

Figure 3.5. Normal Probability Plot of the Standardized Residuals for the Regression of Demographic Variables on News Story Appeal.

Figure 3.5 shows the normal probability plot of the standardized residuals for the regression of the demographic variables on news story appeal. The plot shows a slightly curvilinear relationship, so the assumption of linearity may not have been met. This could indicate the relationship between the demographic variables and news story appeal might be stronger than the linear regression reveals.

However, Tabachnick and Fidell (1989) point out that variables often have a mix of linear and curvilenear relationships, as shown if Figure 3.5.

One variable generally gets smaller (or larger) as the others larger (or smaller) but there is also a curve to the relationship. In such cases, the linear component is usually strong enough that not much is added by trying to capture the curvilinear component (p. 80).

A fourth assumption is that of homoscedasticity, where the variance of the residuals about predicted dependent variable scores is the same for all predicted scores (Tabachnick & Fidell, 1989, p. 82). If this assumption is met, the scatterplot of the residuals will be roughly the same width all over. Figure 3.6 shows the scatterplot for the standardized residuals of the regression of the demographic variables on story information recall. The residuals appear to be slightly heteroscedastic, which is not surprising since the residuals are slightly negatively skewed and homoscedasticity is related to the assumption of normality.

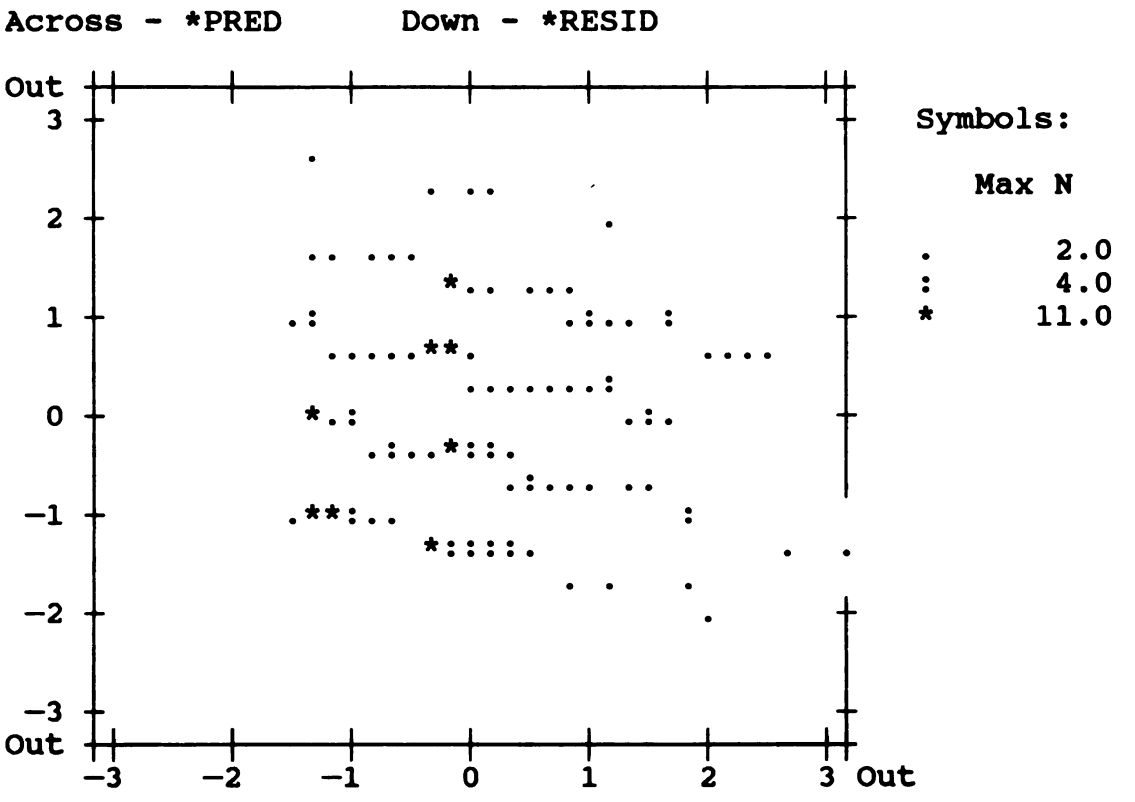

Figure 3.6. Standardized Residuals Scatterplot of the Regression of Demographic Variables on Story Information Recall.

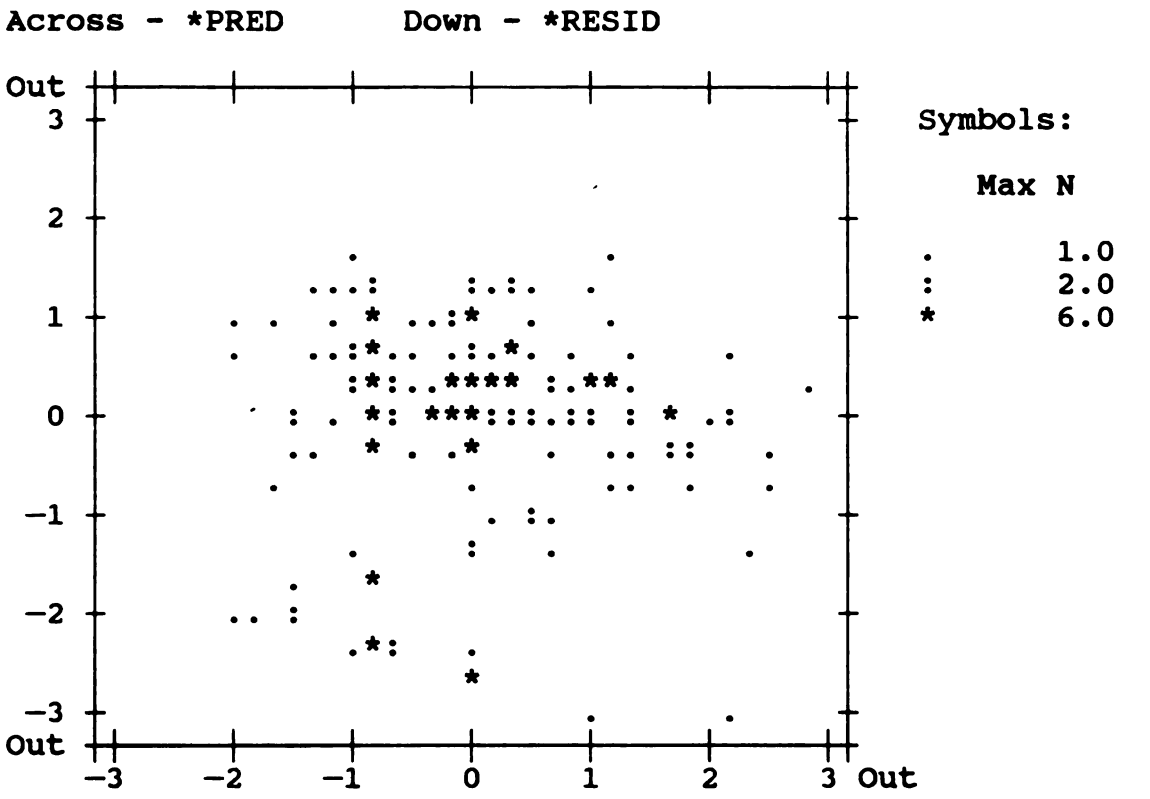

Figure 3.7. Standardized Residuals Scatterplot of the Regression of Demographic Variables on News Story Appeal.

Figure 3.7 shows the scatterplot for the standardized residuals of the regression of the demographic variables on story information recall. The residuals appear to be slightly heteroscedastic, which again is not surprising since the residuals are slightly positively skewed.

Multivariate outliers were sought in a regression of the demographic variables in which the Mahalanobis distance of each case to the centroid of all cases was computed. The ten cases with the largest distance are shown

in Table 3.3. Mahalanobis distance is distributed as a chi square variable, with degress of freedom equal to the number of independent variables (Tabachnick & Fidell, 1989, p. 175). The critical χ^2 at $\alpha = .001$ for 4 df is 18.467. Any case in Table 3.3 with a value larger than 18.467 is a multivariate outlier. There was only one outlier.

Table 3.3. Mahalanobis' Distance Values for Regression of Demographic Variables

Case #	Value
27	19.23962
56	13.93316
67	13.91343
29	13.87812
57	13.41107
49	12.38018
55	12.21145
28	11.69143
68	11.39815
76	10.83536

A final assumption of regression is that there be no multicollinearity or singularity among the variables in the equation. With multicollinearity, the variables are very highly correlated (.90 and above). With singularaity, the variables are perfectly correlated and one of the variables is a combination of one or more of the other variables. When variables are multicollinear or

singular, they contain redundant information and are not all needed in the same analysis (Tabachnick & Fidell, 1989, p. 87).

The regression runs of the demographic variables on story information recall and news story appeal provided no indications of multicollinearity or singularity. All variables entered the equations without violating the default value for tolerance. Further, the highest correlation, between Age and Income, is .55 (see Table 4.18).

After testing the hypotheses, analyses of variance were used to test for main effects and interactions among the treatment variables on story information recall and news story appeal. ANOVA is used when two or more means are compared to see if there are any reliable differences among them. A main effect is the influence of an independent variable on the dependent variable. An intereaction refers to the concomitant influence of two or more variables on the single dependent variable (Wimmer & Dominick, 1994, pp. 248-249). ANOVA was appropriate because the dependent variable (information recall score or story appeal score) was measured at the interval level and the independent variables were measured at the nominal level (received or didn't receive treatment).

Finally, hierarchical regression was also used to examine the combined influence of the demographic variables and the treatment variables on news information recall and news story appeal. As noted above, hierarchical regression requires that several assumptions be examined.

With 192 cases and 7 independent variables, the cases-to-

independent variable ratio was 27:1, above the minimum requirements for regression. There are no missing data.

Figure 3.8 shows the histogram for the standardized residuals for the regression of the independent variables on story information recall. The residuals are fairly normally distributed, so the assumption of normality was met.

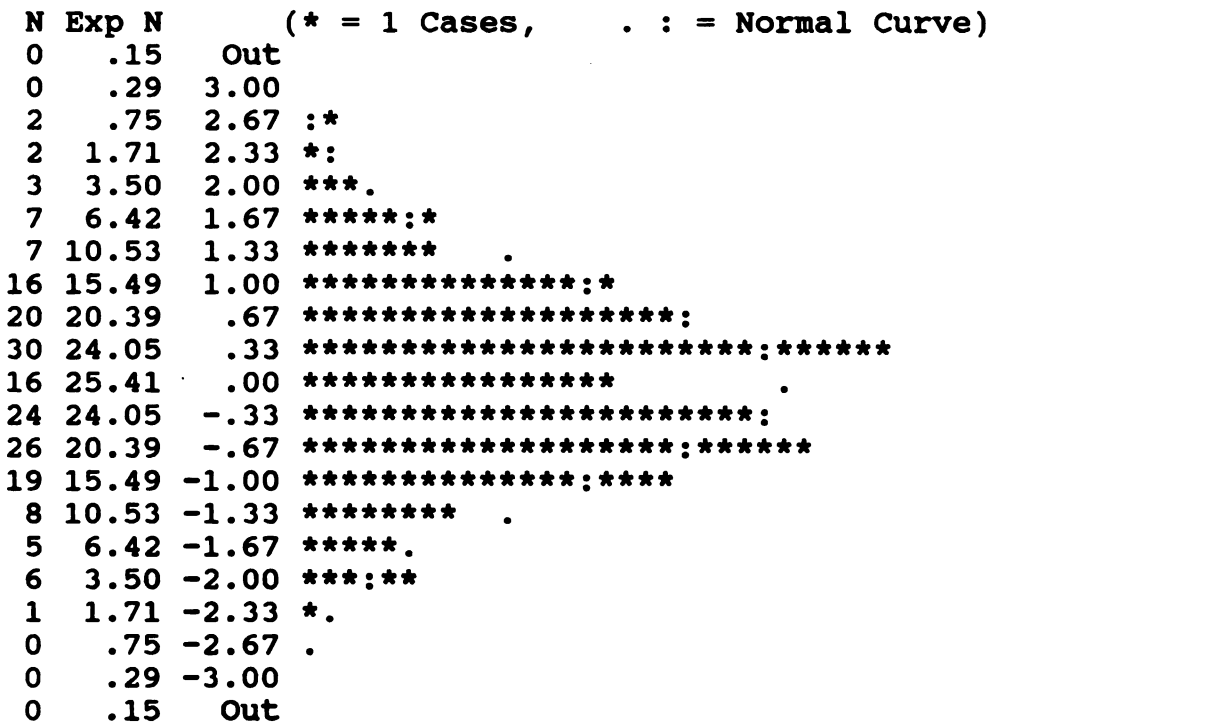

Figure 3.8. Standardized Residuals Histogram for Regression on Story Information Recall.

```
 N Exp N      (* = 1 Cases,     . : = Normal Curve)
 0   .15   Out
 0   .29  3.00
 0   .75  2.67 .
 0  1.71  2.33  .
 1  3.50  2.00 *  .
 4  6.42  1.67 **** .
 8 10.53  1.33 ********  .
24 15.49  1.00 *************:*********
23 20.39   .67 ********************:***
32 24.05   .33 ************************:********
35 25.41   .00 ************************:**********
23 24.05  -.33 ************************.
14 20.39  -.67 **************      .
 2 15.49 -1.00 **             .
 7 10.53 -1.33 *******    .
 2  6.42 -1.67 **    .
 7  3.50 -2.00 ***:***
 7  1.71 -2.33 *:*****
 2   .75 -2.67 :*
 1   .29 -3.00 *
 0   .15   Out
```

Figure 3.9. Standardized Residuals Histogram for Regression on News Story Appeal.

Figure 3.9 shows the histogram for the standardized residuals for the regression of the 7 independent variables on news story appeal. The residuals are slightly positively skewed, so the assumption of normality may not have been met.

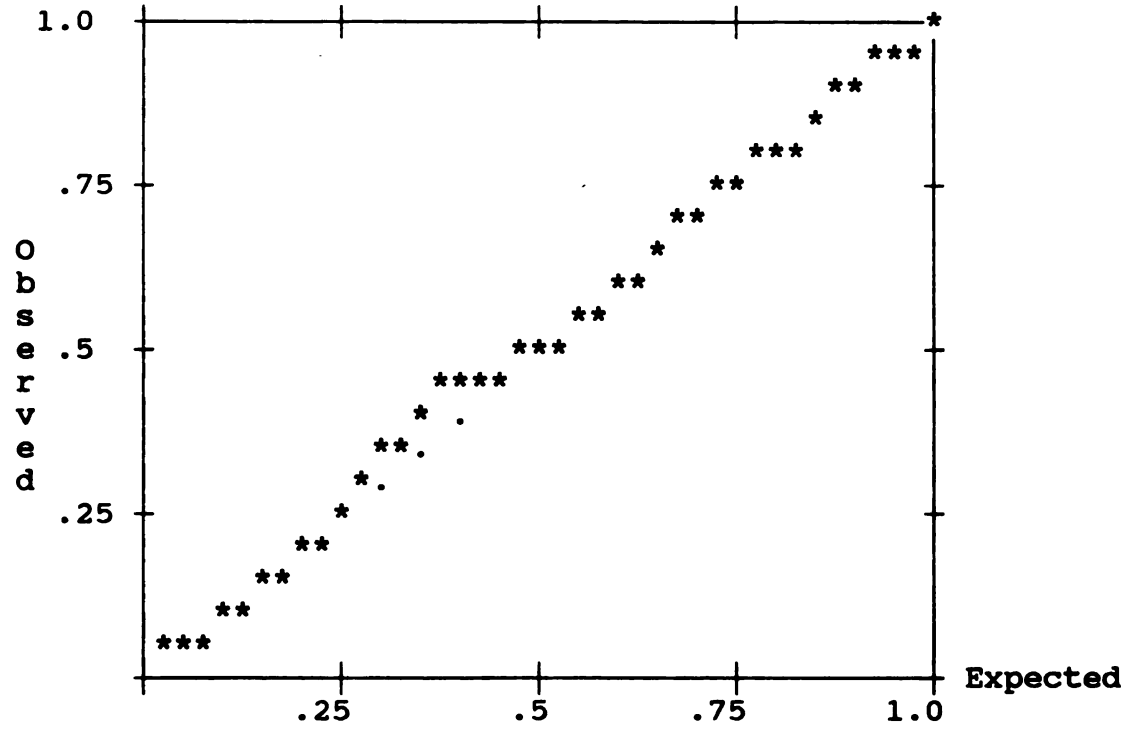

Figure 3.10. Normal Probability Plot of the Standardized Residuals for the Regression on Story Information Recall.

Figure 3.10 shows the normal probability plot of the standardized residuals for the regression on story information recall. The standardized residuals generally run along the normal probability line, and the assumption of linearity has been met.

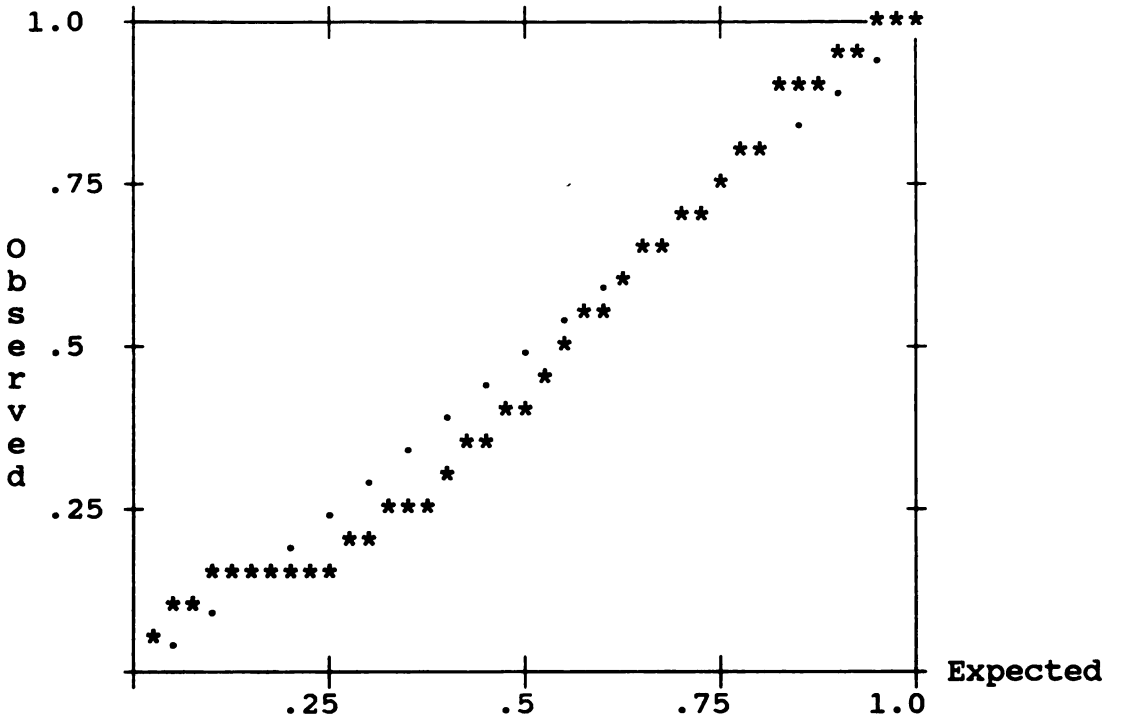

Figure 3.11. Normal Probability Plot of the Standardized Residuals for the Regression on News Story Appeal.

Figure 3.11 shows the normal probability plot of the standardized residuals for the regression on news story appeal. The plot shows a very slight curvilinear relationship. However, the relationship appears to be much more linear than curvilinear, so the assumption of linearity was likely met.

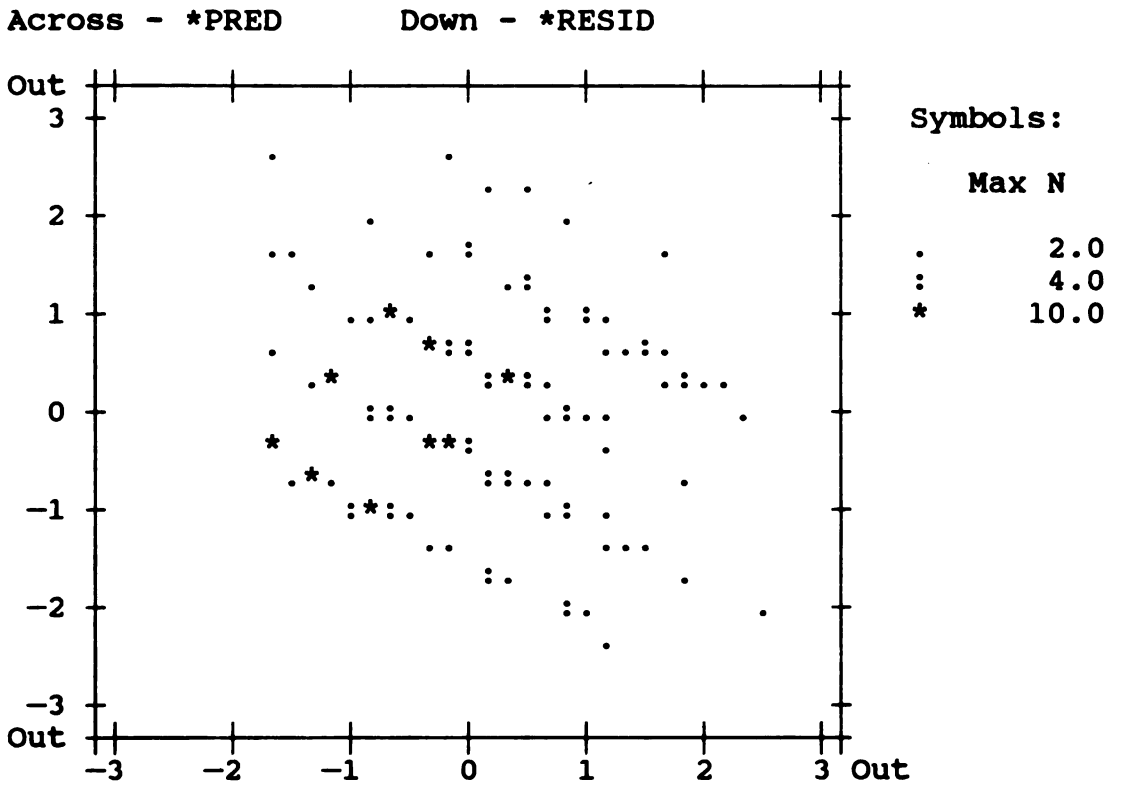

Figure 3.12. Standardized Residuals Scatterplot of the Regression on Story Information Recall.

Figure 3.12 shows the scatterplot for the standardized residuals of the regression of the demographic variables on story information recall. The residuals appear to be generally homoscedastic.

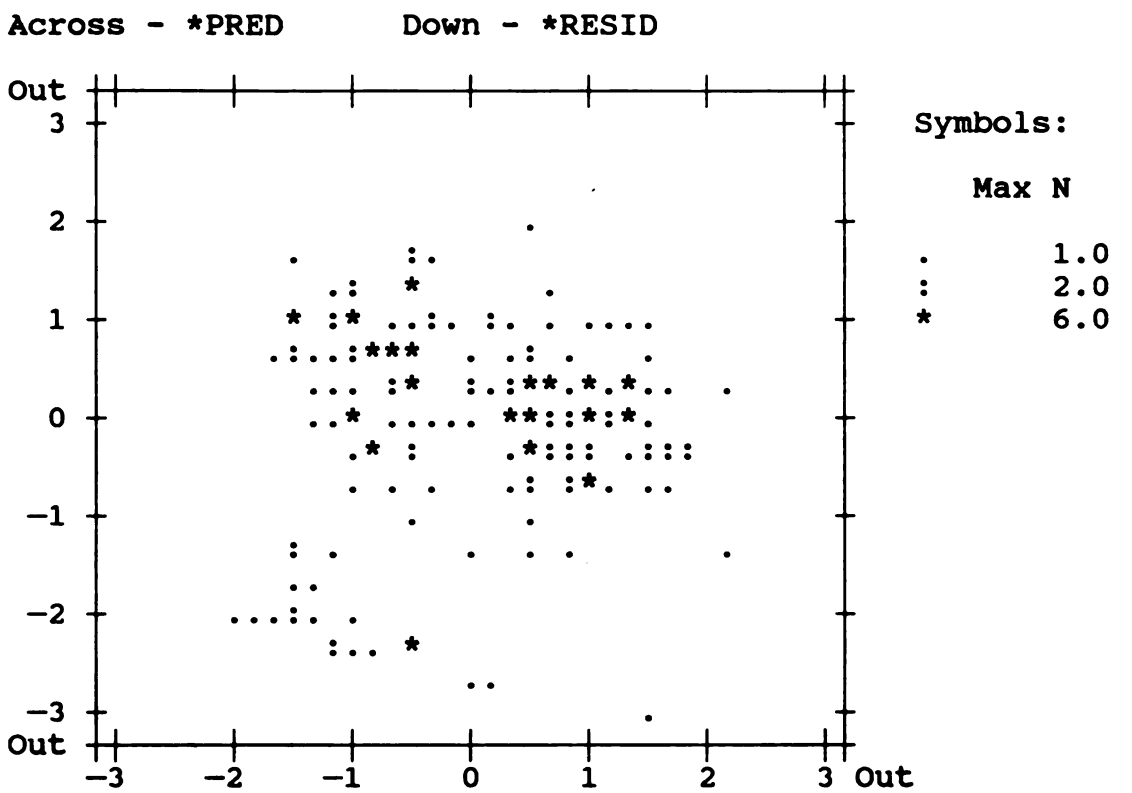

Figure 3.13. Standardized Residuals Scatterplot of the Regression on News Story Appeal.

Figure 3.13 shows the scatterplot for the standardized residuals of the regression on story information recall. The residuals appear to be heteroscedastic.

Multivariate outliers were sought in a regression of the 7 independent variables in which the Mahalanobis distance of each case to the centroid of all cases was computed. The ten cases with the largest distance are shown in Table 3.4. The critical χ^2 at α = .001 for 7 df is 24.322. Any case in

Table 3.4 with a value larger than 24.322 is a multivariate outlier. There were no outliers.

Table 3.4. Mahalanobis' Distance Values for Regression of 7 Independent Variables

Case #	Value
27	23.62765
29	16.52147
67	16.37812
56	15.65576
57	15.64578
49	14.70319
28	14.31375
55	14.00357
68	13.81336
34	13.29745

The regression runs of the 7 independent variables on story information recall and news story appeal provided no indications of multicollinearity or singularity. All variables entered the equations without violating the default value for tolerance. Further, the highest correlation, between Age and Income, is .55 (see Table 4.23).

Most of the violation of assumptions of regression were relatively slight. Agresti and Agresti (1979) point out that regression is robust enough to tolerate such moderate departures (p. 425) and that a particular

regression model may be useful even if these assumptions are not strictly fulfilled, so it is usually adequate to check that none of them is grossly violated (p. 393). And because the present study used a more heterogeneous population than most studies of broadcast news recall, under-estimating the relationship between the demographic variables and story information recall or story appeal was deemed to be tolerable.

CHAPTER IV

RESULTS AND DISCUSSION

Subjects

One hundred ninety-seven subjects participated in the experiment. In order to have an equal number of subjects in each treatment group, response booklets for five subjects were removed from data analysis, leaving 24 subjects in each of the eight treatment groups. One subject was randomly selected for removal from treatment groups 1, 3, and 6, and two subjects were randomly selected for removal from treatment group 8.

Nearly two-thirds (61.5%) of the subjects were female. Just under half (46.8%) had graduated from college with at least a bachelor's degree. Nearly one-quarter (22.9%) held an advanced degree. About one-quarter (28.1%) earned less than $10,000 and just over half (56.8%) earned less $30,000 annually. The subjects ranged in age from 18 to 81 with about one-quarter (24.0%) aged 18-21 and about half (47.9%) aged 18-34.

Representativeness of the Sample

If a sample of individuals from a population is to provide useful descriptions of the total population, it must contain essentially the same variations that exist in the population. Because the subjects were recruited

through letters to class instructors and leaders of social organizations, there is no reason to believe that the 192 subjects are necessarily representative of the entire population.

In fact, the subjects were not very representative of the population of Michigan where 51.5% are female, 15.8% have graduated from college with at least a bachelor's degree, and only 5.6% hold an advanced degree. About one-sixth (15.6%) of Michigan households earn less than $10,000, but about half (48.2%) earn less than $30,000 annually. Less than one-tenth (8.6%) of Michigan adults are aged 18-21 and only about one-third (37.7%) are aged 18-34 (U.S. Census Data, 1990).

The differences between the subjects and the Michigan population are likely due to the fact that one-quarter of the study subjects were students in mass communication classes and that the non-student subjects were drawn from the population of the Lansing, Michigan metropolitan area, which includes Michigan State University. Thus the results of this experiment may not be generalizable outside the experimental group for descriptive purposes. Still, while the subjects are not that representative of the Michigan population, they are a more heterogeneous group than in most studies of broadcast news recall.

However, because the purpose of the present study is more explanatory in nature, there is less danger in this potential defect. If the results indicate that recall of radio news stories is greater for those receiving a treatment than for those not receiving the treatment, we can have some

confidence--without being certain--that the treatment would have a similar effect in the community at large. Of greater importance to the present study, therefore, is the comparability of subjects in each of the eight experimental groups.

It is possible such demographic variables as gender or age could have an effect on radio news recall and Hypotheses 14 and 15 directly address such an effect. But these variables could also confound the effect of the experimtental treatments on radio news recall. Such an influence would be controlled for if these demographic variables were distributed in approximately the same manner in all treatment groups (Wimmer & Dominick, 1994, pp. 89-90). The eight treatment groups were therefore checked to see how comparable they were according to these demographic variables.

A contingency table was created for the distribution of subjects in the eight treatment groups according to gender. The chi-square statistic was computed to determine if the cells were significantly different. A significant chi-square would indicate assignment error. A non-significant chi-square, on the other hand, means any difference in the makeup of the cells is due to chance and the cells are equivalent. The results presented in Table 4.1 show there were no significant differences between the cells and thus, no assignment error ($\chi^2 = 12.23$, df = 7, $p > .05$). Therefore, the treatment groups are comparable in makeup according to gender of the subjects.

Table 4.1. Treatment Group Distribution by Subjects' Gender

Group No.	Treatment Conditions	Gender Male	Female
1	Actuality, No Redundancy, No Distraction	50% (12)	50% (12)
2	Reader, No Redundancy, No Distraction	58% (14)	42% (10)
3	Actuality, Redundancy, No Distraction	50% (12)	50% (12)
4	Reader, Redundancy, No Distraction	21% (5)	79% (19)
5	Actuality, No Redundancy, Distraction	33% (8)	66% (16)
6	Reader, No Redundancy, Distraction	33% (8)	66% (16)
7	Actuality, Redundancy, Distraction	25% (6)	75% (18)
8	Reader, Redundancy, Distraction	38% (9)	62% (15)
	Total Population	38.5% (74)	61.5% (118)

$\chi^2 = 12.23$, df = 7, $p > .05$

Table 4.2 shows the frequency distribution of levels of eduation for all subjects. Because the interval levels were not equal, they were collapsed to create a binomial variable separating subjects at the mean level of education based on whether or not the subject had graduated from college.

Table 4.2. Highest Level of Education for All Subjects

		Frequency	Percent	Cum Percent
1	Elementary School or Less	2	1.0	1.0
2	Some High School	1	0.5	1.6
3	High School Graduate	19	9.9	11.5
4	Completed Trade or Technical School	10	5.2	16.7
5	Some College	70	36.5	53.1
6	Graduated with a Bachelor's Degree	25	13.0	66.1
7	Some Graduate or Law School	21	10.9	77.1
8	Graduated with Law Degree	2	1.0	78.1
9	Graduated with Master's or Ph.D. Degree	42	21.9	100.0

Mean = 5.95

A contingency table was also created for the distribution of subjects according to whether or not they had graduated from college. The results presented in Table 4.3 indicate there are significant differences between the cells ($\chi^2 = 51.12$, df = 7, $p < .001$). Therefore, the eight treatment groups do not appear to be comparable in makeup according to the education level of the subjects, which may be a confounding variable.

Table 4.3. Treatment Group Distribution by Subjects' Level of Education

Group No.	Treatment Conditions	Graduated College No	Yes
1	Actuality, No Redundancy, No Distraction	75% (18)	25% (6)
2	Reader, No Redundancy, No Distraction	88% (21)	12% (3)
3	Actuality, Redundancy, No Distraction	67% (16)	33% (8)
4	Reader, Redundancy, No Distraction	8% (2)	92% (22)
5	Actuality, No Redundancy, Distraction	33% (8)	67% (16)
6	Reader, No Redundancy, Distraction	63% (15)	37% (9)
7	Actuality, Redundancy, Distraction	25% (6)	75% (18)
8	Reader, Redundancy, Distraction	67% (16)	33% (8)
	Total Population	53.1% (102)	46.9% (90)

$\chi^2 = 51.12$, df = 7, $p < .001$

Table 4.4. Treatment Group Distribution by Subjects' Level of Income

Group No.	Treatment Conditions	Mean Income Level*	Standard Deviation
1	Actuality, No Redundancy, No Distraction	4.79	1.91
2	Reader, No Redundancy, No Distraction	4.13	2.47
3	Actuality, Redundancy, No Distraction	4.54	2.30
4	Reader, Redundancy, No Distraction	5.58	1.91
5	Actuality, No Redundancy, Distraction	3.92	1.84
6	Reader, No Redundancy, Distraction	2.50	0.83
7	Actuality, Redundancy, Distraction	4.71	2.29
8	Reader, Redundancy, Distraction	3.71	1.69
	Total Population	4.23	2.11

$F = 5.19$, $df = 7$, $p < .001$

*Income Levels:

2	under $10,000	8	$60,000 to $69,999
3	$10,000 to $19,999	9	$70,000 to $79,999
4	$20,000 to $29,999	10	$80,000 to $89,999
5	$30,000 to $39,999	11	$90,000 to $99,999
6	$40,000 to $49,999	12	$100,000 and over
7	$50,000 to $59,999		

Analyses of variance were used to determine if the eight experimental groups were comparable according to subjects' annual income, and according to subjects' age. This procedure compared the mean level of income for each treatment group to see if there were any differences among them. The F ratio compares the differences among income levels within each group to the differences among income levels between groups. A non-significant F indicates the two estimates of variance do not differ appreciably such that any differences are due to chance, and the treatment groups are therefore comparable. On the other hand, a significant F indicates the two estimates do differ appreciably, and assignment error occurred (Tabachnick & Fidell, 1989, pp. 37-38).

Subjects' income was measured at the interval level. Response selections 1 ("less than $5,000") and 2 ("$5,000 to $9,999") were combined in order to make all intervals equivalent. The results presented in Table 4.4 indicate there are significant differences between the group means ($F = 5.19$, $df = 7$, $p < .001$), and assignment error occurred. Therefore, the eight treatment groups do not appear to be comparable in makeup according to the income level of the subjects, so that income may be a confounding variable.

Subjects were asked to report the year of their birth and each subjects' age was calculated by subtracting the reported year from 1995. Table 4.5 presents the analysis of variance of the average age of subjects in each treatment group. The results indicate there are significant differences

between the average age of the subjects in each group ($F = 6.43$, $df = 7$, $p < .001$), also indicating assignment error. Therefore, the eight treatment groups do not appear to be comparable in makeup according to the age of the subjects, so age may also be a confounding variable.

In summary then, the eight treatment groups were comparable in makeup according to the gender of the subjects, but not comparable in makeup according to the education level, income level, or age of the subjects.

Table 4.5. Treatment Group Distribution by Subjects' Age

Group No.	Treatment Conditions	Mean Age	Standard Deviation
1	Actuality, No Redundancy, No Distraction	41.00	13.92
2	Reader, No Redundancy, No Distraction	41.58	20.02
3	Actuality, Redundancy, No Distraction	49.88	19.20
4	Reader, Redundancy, No Distraction	37.29	11.28
5	Actuality, No Redundancy, Distraction	29.21	9.70
6	Reader, No Redundancy, Distraction	27.33	9.96
7	Actuality, Redundancy, Distraction	35.25	13.28
8	Reader, Redundancy, Distraction	32.92	12.10
	Total Population	36.81	15.52

$F = 6.43$, $df = 7$, $p < .001$

Testing the Hypotheses

A bivariate analysis was conducted for Hypotheses 1 through 4. The dependent variable was whether or not the subject recalled the target story slug. The independent variable was the treatment condition. Chi-square was computed for each contingency table to determine if the cells were significantly different.

H1: The target story slug will be recalled more frequently when the story contains repetition (repeated information) than when it does not.

As Table 4.6 shows, the data do not support this hypothesis. Of the subjects in experimental groups without repetition, 75% correctly recalled the target story slug. This is not significantly different from the 82.3% of the subjects in groups with repetition who recalled the target story slug ($\chi^2 = 1.52$, df = 1, $p > .05$). Thus repetition did not have an effect on recall of the target story slug.

Table 4.6. Frequency of Recall of Target Story Slug With & Without Repetition

	Repetition		
	No	Yes	Total
Did Not Recall	25% (24)	18% (17)	21% (41)
Did Recall	75% (72)	82% (79)	79% (151)
Total	50% (96)	50% (96)	100% (192)

$\chi^2 = 1.520$, df = 1, $p > .05$

Table 4.7. Frequency of Recall of Target Story Slug With and Without Actuality

	Actuality		
	No	Yes	Total
Did Not Recall	31% (30)	11% (11)	21% (41)
Did Recall	69% (66)	89% (85)	79% (151)
Total	50% (96)	50% (96)	100% (192)

$\chi^2 = 11.196$, df = 1, $p < .001$

H2: The target story slug will be recalled more frequently when the story doesn't contain an actuality than when it does contain an actuality.

As Table 4.7 shows, the results indicated a highly significant relationship in the opposite direction from this hypothesis ($\chi^2 = 11.196$, df $= 1$, $p<.001$). Of the subjects who recalled the target story slug, 56.3% listened to the story with an actuality while 43.7% listened to the target story without an actuality. In fact, of the subjects who did not recall the story slug, 11.5% listened to the story with an actuality but 31.3% listened to it without an actuality. So using an actuality in a radio news story may have a positive effect on recall of that story.

H3: The target story slug will be recalled more frequently when the story contains an actuality with repetition than when it contains an actuality without repetition.

The data do not support this hypothesis as indicated in Table 4.8. The target story was recalled by 91.7% of the subjects who heard it with an actuality without repetition, but only by 85.4% of subjects who heard it with an actuality with repetition. This difference was not statistically significant ($\chi^2 = 0.924$, df $= 1$, $p>.05$).

Table 4.8. Frequency of Story Slug Recall in Target Story With and Without Repetition in Actuality

	Repetition		
	No	Yes	Total
Did Not Recall	8% (4)	15% (7)	11% (11)
Did Recall	92% (44)	85% (41)	89% (85)
Total	50% (48)	50% (48)	100% (96)

$\chi^2 = 0.924$, df = 1, $p > .05$

Table 4.9. Frequency of Target Story Slug Recall While Engaged or Not Engaged in Distracting Activity

	Distraction		
	No	Yes	Total
Did Not Recall	10% (10)	32% (31)	21% (41)
Did Recall	90% (86)	68% (65)	79% (151)
Total	50% (96)	50% (96)	100% (192)

$\chi^2 = 13.677$, df = 1, $p < .001$

H4: The target story slug will be recalled more frequently when subjects are not engaged in a distracting activity than when subjects are so engaged.

The data support this hypothesis, as indicated in Table 4.9. The target story was recalled by 89.6% of subjects not engaged in a distracting activity, but by only 67.7% of subjects engaged in a distracting activity. This difference was highly significant ($\chi^2 = 13.677$, df = 1, $p<.001$). So distraction has a negative effect on the recall of radio news story slugs.

The mean story information recall scores (see p. 30) for each treatment condition were used to test Hypotheses 5 through 8.

H5: Recall of target story information will be significantly greater in stories without actualities than in stories with actualities.

The data do not support this hypothesis. Table 4.10 shows the mean story information recall scores by treatment groups hearing a target story with and without an actuality. Subjects hearing the target story with an actuality had a higher mean story information recall score ($X = 1.57$) than subjects hearing the target story without an actuality ($X = 1.32$), but a t-test showed the difference was not significant ($t = 1.51$, df = 190, $p>.05$). So adding an actuality to a radio news story may not have an effect, good or bad, on recall of information in that story.

Table 4.10. Mean Story Information Recall Scores by Target Story With and Without Actuality

	Mean	N	SD
With Actuality	1.57	96	1.140
Without Actuality	1.32	96	1.147

$t = 1.51$, $df = 190$, $p > .05$

Table 4.11. Mean Story Information Recall Scores in Target Story With and Without Repetition

	Mean	N	SD
With Repetition	1.75	96	1.196
Without Repetition	1.15	96	1.015

$t = 3.777$, $df = 190$, $p < .001$

H6: Recall of target story information will be significantly greater in stories with repetition than in stories without repetition.

The data support this hypothesis, as indicated in Table 4.11. Subjects hearing the target story with repetition had a higher mean story information recall score ($X = 1.75$) than subjects hearing the target story without repetition ($X = 1.15$). A t-test showed the difference was highly significant ($t = 3.77$, $df = 190$, $p<.001$).

H7: Recall of target story information will be significantly greater when the story contains an actuality with repetition than when it contains an actuality without repetition.

As Table 4.12 shows, the data support this hypothesis and suggest a possible interaction effect between actualities and repetition. Subjects hearing the target story with an actuality that contained repetition had a higher mean story information recall score ($\bar{X} = 2.00$) than subjects hearing the target story with an actuality but no repetition ($\bar{X} = 1.15$). A t-test showed the difference was highly significant ($t = 3.94$, $df = 190$, $p < .001$). These results indicate adding repetition to actualities may enhance recall of information in a radio news story.

Table 4.12. Mean Story Information Recall Scores by Target Story With Actuality With and Without Repetition

	Mean	N	SD
With Repetition	2.00	48	1.130
Without Repetition	1.15	48	0.989

$t = 3.94$, $df = 190$, $p < .001$

H8: Recall of target story information will be significantly greater in stories heard while not engaged in distracting activities than in stories heard while so engaged.

The data support this hypothesis, as indicated in Table 4.13. Subjects not engaged in the distracting activity had a higher mean story information recall score ($X = 1.92$) than subjects involved in the distracting device ($X = 0.98$). A t-test showed the difference between the two group means to be highly significant ($t = -6.19$, $df = 190$, $p < .001$). So engaging in a distracting activity has a negative effect on recall of information in radio news stories.

Table 4.13. Mean Story Information Recall Scores by Target Story With and Without Distraction

	Mean	N	SD
With Distraction	0.98	96	1.056
Without Distraction	1.92	96	1.043

$t = -6.19$, $df = 190$, $p < .001$

The mean appeal score (see p. 31) for each of the treatment groups was used to test Hypotheses 9 through 12.

H9: Radio news stories without actualities will be perceived as significantly more appealing than stories with actualities.

The data do not support this hypothesis, as indicated in Table 4.14. On average, subjects in groups where the target story contained an actuality rated the story as more appealing ($X = 36.99$) than subjects in groups where the target story did not contain an actuality ($X = 33.90$). However, a t-test did not show a significant difference between the two means ($t = 1.52$, $df = 190$, $p > .05$). So again, adding an actuality does not appear to produce a positive or negative effect on the appeal of a radio news story.

Table 4.14. Mean Appeal Scores for Target Story With & Without Actuality

	Mean	N	SD
With Actuality	36.99	96	12.514
Without Actuality	33.90	96	15.469

$t = 1.52$, $df = 190$, $p > .05$

H10: Radio news stories with repetition will be perceived as significantly more appealing than stories without repetition.

The data do not support this hypothesis, as indicated in Table 4.15. Subjects in groups where the target story contained repetition rated the target story as more appealing ($\bar{X} = 36.53$) than subjects in groups where the target story did not contain repetition ($\bar{X} = 34.35$), but the t-test again did not show the difference to be significant ($t = 1.07$, $df = 190$, $p > .05$). So repetition within a radio news story does not have a positive or negative effect on the appeal of the story.

Table 4.15. Mean Appeal Scores for Target Story With & Without Repetition

	Mean	N	SD
With Repetition	36.53	96	13.786
Without Repetition	34.35	96	14.432

$t = 1.07$, $df = 190$, $p > .05$

Table 4.16. Mean Scores on Appeal of Actuality Story With & Without Repetition

	Mean	N	SD
With Repetition	38.17	48	13.601
Without Repetition	35.81	48	11.345

$t = 0.92$, $df = 190$, $p > .05$

H11: Radio news stories with actualities with repetition will be perceived as significantly more appealing than stories with actualities without repetition.

The data do not support this hypothesis, as indicated in Table 4.16. On average, subjects in groups where the target story contained an actuality with repetition rated the story as more appealing ($X = 38.17$) than subjects in groups where the target story contained an actuality without repetition ($X = 35.81$). But once again, a t-test did not find a significant difference between the two means ($t = 0.92$, $df = 190$, $p > .05$).

H12: Radio news stories heard while engaged in a distracting activity will be perceived as significantly less appealing than stories heard while not engaged in a distracting activity.

The data support this hypothesis, as indicated in Table 4.17. Subjects engaged in the distracting activity rated the target story as less appealing ($X = 30.35$) than subjects not engaged in the distracting activity

(X = 40.53). The t-test showed the difference to be highly significant (t = -5.34, df = 190, p<.001). So engaging in a distracting activity while listening to a radio news story has a negative effect on story appeal.

Table 4.17. Mean Appeal Scores for Target Story While Engaged and Not Engaged in Distracting Activity

	Mean	N	SD
Distracting Activity	30.35	96	16.251
No Distracting Activity	40.53	96	9.181

t = -5.34, df = 190, p < .001

H13: There will be a positive correlation between the appeal of a radio news story and amount of information recalled from it.

The data support this hypothesis. Pearson's correlation coefficient was determined using each subject's "story information recall score" and "appeal score" for the target story. The result shows a significant, moderate, positive correlation between appeal of a news story and the amount of information recalled from it (r = 0.5106, p < .001). However, a correlation does not indicate causal order, so it is not possible to conclude from these results that making a story more appealing will have an effect on recall of information contained in that story.

The target news story information scores (see p. 30) and target news story appeal scores (see p. 31) were used to test Hypotheses 14 and 15. Hierarchical regression was used to determine what each demographic variable added to regression equation at its own point of entry. This method was chosen because it allows for control of the order of entry for the independent variables. The demographic variables were entered in the presumed causal order. That is, the variables which might logically contribute the most to the regression equation were entered first followed by the variables which might contribute the least.

Based on prior research findings as noted above, the order of entry of the demographic variables was Age, Gender, Income, and Education. The discrete variables (Gender and Education) included in the analyses were converted to a set of dichotomous variables by dummy variable coding so that when entered as a group, the variance due to the original discrete variable could be analyzed (Tabachnick and Fidell, 1989, pp. 124-125). A dichotomous dummy variable is made by assigning a one to one condition and a zero to another. So Education was converted to a dichotomous variable based on whether or not the subject had graduated from college (College Graduate = 1, Not a College Graduate = 0).

Table 4.18 shows the bivariate correlations among the 4 independent variables and the 3 dependent variables. As might be expected, Income was moderately correlated with Age ($r = .55$) and being Education ($r = .51$). Age had a slight but notable correlation with Education ($r = .17$).

None of the demographic variables were correlated with Story Slug Recall. Story Information Recall had a slight but notable correlation with Age (r = .23) and Education (r = .16). Story Appeal had a slight but notable correlation with Age (r = .21), Income (r = .15), and Gender (r = .14).

Regression will be best when each independent variable is strongly correlated with the dependent variable but uncorrelated with other IVs (Tabachnick & Fidell, 1989, p. 128). Because these assumptions were not always met, it is unlikely that much of the variance in the recall and appeal scores will be explained by the demographic variables.

Table 4.18. Correlation Matrix for Demographic Variables with Recall and Appeal Scores

Variables	Age	Income	Gender	Education
Age	—			
Income	.55	—		
Gender	-.01	-.01	—	
Education	.17	.51	.08	—
Information Recall	.23	.11	-.16	.03
Story Appeal	.21	.15	-.14	-.08

Note. Significance levels are $p < .05$ when correlations exceed .13, $p < .01$ when correlations exceed .16, and $p < .001$ when correlations exceed .22.

H14: There will be no significant difference in radio news story information recall based on gender, education, income, or age.

The data only partially support this hypothesis. Table 4.19 displays the unstandardized regression coefficients (*B*) and intercept, the standardized regression coefficients (ß), the R^2 change, and *R*, R^2, and adjusted R^2 after entry of all four independent variables. R^2 represents the proportion of the variance in the dependent variable that is accounted for by the independent variables. The higher the R^2 is (the closer to 1.00) the more accurate the prediction is considered to be (Wimmer & Dominick, 1994, p. 260). However, dummy variables used in the regression equation tend to produce a small R^2 because they don't have as much range as continuous variables. A small R^2 will also result when the dependent variables have a limited range, as in the case with Story Slug Recall and Story Information Recall.

For similar reasons, it is also inappropriate to interpret the unstandardized regression coefficients as indicators of the relative importance of the independent variables. The actual magnitude of the coefficients depends on the units in which the variables are measured. When variables differ substantially in the units of measurement, the sheer magnitude of their coefficients does not reveal anything about relative importance. The Betas (ß) allow for better comparison of the contribution of the independent variables. But they are contingent on the other independent variables in the equation and are affected by the correlations of

the independent variables (Norusis, 1990, p. B-94).

As Table 4.19 shows, about 6% of the variance in Story Information Recall was accounted for by the four demographic variables (Adj. R^2 = 0.057, F(4, 187) = 3.88, p < .01). But only two variables produced a significant change in R^2. Age (ß = 0.233, R^2 changed = 0.052) contributes the most to variance accounted for in Story Information Recall, followed by Gender (ß = -0.156, R^2 changed = 0.024). These are also the only two variables to significantly correlate with Story Information Recall, which suggests they may have an effect on Story Information Recall.

Table 4.19. Heirarchical Regression of Demographic Variables on Story Information Recall

Step	Variables	*B*	ß	R^2 Change	Sig. of Change
1	Age	0.018	0.243	0.052	.002
2	Gender	-0.369	-0.157	0.024	.027
3	Income	-0.019	-0.035	0.001	.745
4	Education	0.030	0.013	0.000	.875
	Intercept	1.079			

R = 0.277, R^2 = 0.077, Adjusted R^2 = 0.057, F(4, 187) = 3.88, p < .01

H15: There will be a significant difference in the appeal of a radio news story based on gender, education, income, or age.

The data again partially support this hypothesis, as indicated in Table 4.20. About 7% of the variance in News Story Appeal was accounted for by the four demographic variables (Adj. R^2 = 0.066, F(4, 187) = 4.47, $p < .01$). Age (ß = 0.158, R^2 change = 0.044) and Education (ß = 0.188, R^2 change = 0.022) produced a significant change in R^2 and appear to contribute most of the variance accounted for in News Story Appeal. However, Age (r = .21), Income (r = .15), and Gender (r = .14) had significant correlations with News Story Appeal, but Education did not (r = .08). It's possible that, due to the significant correlations of Income with Age (r = .55) and Education (r = .51), and Education with Income (r = .17), much of the effect of Income on the variance in Story Appeal was shared with, and therefore accounted for by Age. This suggests a possible interaction of the demographic variables which may have an effect on News Story Appeal.

Table 4.20. Heirarchical Regression of Demographic Variables on News Story Appeal

Step	Variables	*B*	ß	R^2 Change	Sig. of Change
1	Age	0.144	0.158	0.044	.004
2	Gender	-3.463	-0.120	0.018	.057
3	Income	0.977	0.146	0.001	.627
4	Education	-4.941	0.175	0.022	.036
	Intercept	30.445			

$R = 0.292$, $R^2 = 0.085$, Adjusted $R^2 = 0.066$, $F(4, 187) = 4.37$, $p < .01$

Testing for Interactions

Having tested each of the hypotheses and found mixed effects of the individual treatment variables on the recall of radio news story information and radio news story appeal, it would be beneficial to test the treatment variables for interaction effects of the treatment variables on the two dependent variables. This was accomplished by computing analyses of variance of the difference in mean story information recall scores, and mean story appeal scores for all treatment groups.

Table 4.21 shows the mean story information recall scores under all treatment conditions. The means were not different for every treatment group. There were highly significant main effects for repetition ($F(1, 184) = 17.52$, $p<.001$) and distraction ($F(1, 184) = 41.90$, $p<.001$). There were no interaction effects. Subjects who listened to radio news stories with repetition, on average, recalled more information ($X = 1.75$) than subjects who listened to stories without repetition ($X = 1.15$). And subjects who listened to radio news stories while engaged in a distracting activity, on average, recalled less information ($X = 0.98$) than subjects who listened to news stories while not engaged in a distracting activity ($X = 1.92$).

These results suggest that using repetition within a radio news story will increase story information recall, and that listening to radio news stories while engaged in a distracting activity will decrease story information recall. But the two treatment variables do not interact to enhance either effect.

Table 4.21. Mean Story Information Recall Scores by Treatment Group

	Treatment		
	Actuality	Redundancy	Distraction
No	1.32	1.15	1.92
Yes	1.57	1.75	0.98

		Redundancy	
		No	Yes
Story Type	Reader	1.15	1.50
	Actuality	1.15	2.00

		Distraction	
		No	Yes
Story Type	Reader	1.79	0.85
	Actuality	2.04	1.10

		Distraction	
		No	Yes
Redundancy	No	1.67	0.63
	Yes	2.17	1.33

Table 4.21 (cont').

		Distraction			
		No		Yes	
		Redundancy			
		No	Yes	No	Yes
Story Type	Reader	1.67	1.92	0.63	1.08
	Actuality	1.67	2.42	0.63	1.58

Analysis of Variance					
Source of Variation	SS	*df*	Mean Sq.	*F*	Sig.
Main Effects	62.71	3	20.90	20.76	.000
Actuality	3.00	1	3.00	2.98	.086
Redundancy	17.52	1	17.52	17.40	.000
Distraction	42.19	1	42.19	41.90	.000
2-Way Interactions	3.52	3	1.17	1.17	.324
Actuality x Redundancy	3.00	1	3.00	2.98	.086
Actuality x Distraction	0.00	1	0.00	0.00	.999
Redundancy x Distraction	0.52	1	0.52	0.52	.473
3-Way Interaction	0.00	1	0.00	0.00	.999
Explained	66.23	7	9.46	9.40	.000
Residual	185.25	184	1.01		
Total	251.78	191	1.32		

Table 4.22 shows the mean story appeal score under all treatment conditions. The means varied for every treatment group, but the differences were only significant under one condition, distraction ($F(1, 184) = 28.79$, $p < .001$). On average, subjects who listened to radio news while engaged in the distracting activity rated the target story less appealing ($X = 30.35$) than subjects who listened to the story while not engaged in distracting activity ($X = 40.53$). There were no interaction effects.

These ANOVA results suggest that distraction produces a significant effect on the perceived appeal of radio news stories and that neither the inclusion of an actuality or repetition produces a similar effect consistently.

Table 4.22. Mean Story Appeal Recall Scores by Treatment Group

	Treatment		
	Actuality	Redundancy	Distraction
No	33.90	34.35	40.53
Yes	36.99	36.53	30.35

		Redundancy	
		No	Yes
Story Type	Reader	32.90	34.90
	Actuality	35.81	38.17

		Distraction	
		No	Yes
Story Type	Reader	40.04	27.75
	Actuality	41.02	32.96

		Distraction	
		No	Yes
Redundancy	No	39.27	29.44
	Yes	41.79	31.27

Table 4.22 (cont').

		Distraction			
		No		Yes	
		Redundancy			
		No	Yes	No	Yes
Story Type	Reader	40.33	39.75	25.46	30.04
	Actuality	38.21	43.83	33.42	32.50

Analysis of Variance					
Source of Variation	SS	*df*	Mean Sq	*F*	Sig.
Main Effects	5658.43	3	1886.14	10.92	.000
Actuality	459.42	1	459.42	2.66	.105
Redundancy	227.51	1	227.51	1.32	.253
Distraction	4971.51	1	4971.51	28.79	.000
2-Way Interactions	221.81	3	73.94	0.43	.733
Actuality x Redundancy	1.51	1	1.51	0.01	.926
Actuality x Distraction	214.63	1	214.63	1.24	.266
Redundancy x Distraction	5.67	1	5.67	0.03	.856
3-Way Interaction	411.26	1	411.26	2.38	.125
Explained	6291.50	7	898.79	5.20	.000
Residual	31,777.88	184	172.71		
Total	38,069.37	191	199.32		

The demographic variables account for some slight variance in the recall and appeal scores. There is also some interaction effect among the treatment variables. So it seems possible the demographic variables may affect the relationship between the treatment conditions and news information recall and news story appeal. Hierarchical regression was used to look for such an effect.

The independent variables were entered in the opposite presumed causal order so that lesser, or "nuisance" variables were entered first, followed by what were presumed to be more major variables so that the later variables could be evaluated for what they add to the prediction over and above the lesser variables (Tabachnick & Fidell, 1989, p. 143). In this way, variables with greater theoretical importance were given later entry.

The demographic variables were entered in the same order as before. The treatment variables were entered individually in the order of previous observed effect in the tested hypotheses and in the ANOVA test for interactions. The treatment variable which had exhibited the least effect on the dependent variables (Redundancy) was entered fifth, followed by Actuality, and Distraction, the treatment variable which had exhibited the greatest effect on the dependent variables.

Table 4.23 displays the bivariate correlations among the 4 demographic variables, the 3 treatment variables, and the 2 dependent variables. As noted earlier, among the demographic variables, Income moderately correlates with Age ($r = .55$) and Education ($r = .51$). Age also

correlates with Education (r = .17). None of the treatment variables correlate with each other. However, Actuality correlates with Age (r = .13) and Income (r = .12), and Redundancy correlates with Age (r = .13), Income (r = .19), and Education (r = .23). Distraction correlates with Age (r = -.36), Income (r = -.25), Gender (r = .13), and Education (r = .13).

As noted earlier, Story Information Recall correlates with Age (r = .23) and Gender (r = -.16). News Story Appeal correlates with Age (r = .21), Income (r = .15), and Gender (r = -.14). Among the treatment variables, Redundancy correlates with Story Information Recall (r = .26), and Distraction has fairly moderate correlations with Story Information Recall (r = -.41), and Story Appeal (r = -.36).

Table 4.23. Correlation Matrix for Demographic and Treatment Variables with Recall and Appeal Scores

Variables	Demographic				Treatment		
	Age	Income	Gender	Education	Actuality	Redundancy	Distraction
Income	.55	—					
Gender	-.01	.01	—				
Education	.17	.51	.08	—			
Actuality	.13	.12	-.02	.06	—		
Redundancy	.13	.19	.11	.23	.00	—	
Distraction	-.36	-.25	.13	.13	.00	.00	—
Information Recall	.23	.11	-.16	.03	.11	.26	-.41
Story Appeal	.21	.15	-.14	-.08	.11	.08	-.36

Note. Significance levels are $p < .05$ when correlations exceed .11, $p < .01$ when correlations exceed .16 and $p < .001$ when correlations exceed .22.

Table 4.24. Heirarchical Regression of Demographic & Treatment Variables on Story Information Recall

Step	Variables	*B*	ß	R^2 Change	Sig. of Change
1	Age	0.008	0.103	0.052	.002
2	Gender	-0.331	-0.141	0.024	.027
3	Income	-0.086	-0.157	0.000	.745
4	Education	0.180	0.078	0.000	.875
5	Redundancy	0.635	0.278	0.069	.001
6	Actuality	0.245	0.107	0.007	.209
7	Distraction	-0.923	-0.403	0.128	.001
	Intercept	1.671			

$R = 0.530$, $R^2 = 0.281$, Adj. $R^2 = 0.253$, $F(7, 184) = 10.25$, $p < .001$

As Table 4.24 shows, about 25% of the variance in Story Information Recall was accounted for by the independent variables (Adj. $R^2 = 0.253$, $F(7, 184) = 10.25$, $p < .001$). Two demographic (Age and Gender) and two treatment (Redundancy and Distraction) variables produced a significant change in R^2. Distraction accounts for nearly 13% of the variation in Story Information Recall (ß = -0.403, R^2 change = 0.128), while Redundancy accounts for 6.9% (ß = 0.278, R^2 change = 0.069) and Age for 5.2% (ß = 0.103, R^2 change = 0.052). Gender acconts for less than 3% of the variation in Story Information Recall (ß = -0.141, R^2 change = 0.024).

Table 4.25. Heirarchical Regression of Demographic & Treatment Variables on Story Appeal

Step	Variables	*B*	ß	R^2 Change	Sig. of Change
1	Age	0.054	0.060	0.044	.004
2	Gender	-2.795	-0.097	0.018	.057
3	Income	0.413	0.062	0.001	.627
4	Education	-3.022	-0.107	0.022	.036
5	Redundancy	2.609	0.093	0.007	.226
6	Actuality	2.793	0.099	0.007	.236
7	Distraction	-8.403	-0.298	0.070	.001
	Intercept	36.328			

R = 0.412, R^2 = 0.170, Adj. R^2 = 0.134, F(7, 184) = 5.37, $p < .001$

As Table 4.25 shows, about 13% of the variance in Story Appeal was accounted for by the independent variables (Adj. R^2 = 0.134, F(7, 184) = 5.37, $p < .001$). Two demographic variables (Age and Education) and one treatment variable (Distraction) produced significant changes in R^2. Distraction accounted for 7% of the variation in News Story Appeal (ß = -0.298, R^2 change = 0.070), while Age accounted for less than 5% (ß = 0.060, R^2 change = 0.044), and Education for about 2% (ß = 0.107, R^2 change = 0.022).

These results suggest Distraction is an important factor in Story Information Recall and the appeal of radio news stories. Redundancy also

seems to be a factor in radio news story information recall. Including an actuality may be helpful in recalling minimal information about a news story, and does not appear to interfere with information recall. But neither redundancy nor actualities appear to influence the appeal of radio news stories.

Still, the examined independent variables accounted for only relatively small portions of the variance in all three dependent variables. Only Distraction stands out as a possibly strong predictor of the dependent variables.

CHAPTER V

CONCLUSIONS

Previous research on recall of broadcast news has repeatedly indicated that much of what is presented seems to be quickly forgotten. Evidence from this research suggested that information under certain conditions of presentation was not retained because of the presentation techniques being used. Prior research on the effect of additional audio stimuli on recall of radio news presented conflicting results, suggesting that the presence of such additional stimuli might produce a negative effect on recall. Other research suggested that including redundancy in a radio news story in the form of additional verbal information enhanced recall. Research on television news suggested that redundancy between visuals and words significantly improved recall.

The purpose of the present study was to examine the effects of presenting redundant auditory information on the recall of radio news. The research attempted to contribute knowledge by testing production formats, including the use of actualities, that might make broadcast news stories interesting so as to attract an audience and at the same time make it possible for that audience to learn as much as they can from the news story

so that radio news organizations might adopt these techniques to perhaps improve listenership as well as put limited resources to better use.

The present study also attempted to contribute knowledge in terms of research methods by incorporating distraction in terms of a secondary task to provide a more realistic setting for the research experiment. Previous published research has failed to provide such a setting despite that fact that most audience members listen to the radio while also attending to some other task.

And because the present study used new techniques in presenting radio news information, it also attempted to measure the subjects' perceptions of stories presented under these conditions in terms of such things as ease of understanding, interest, and informativeness.

Six of the 15 hypotheses were supported, 2 were partially supported, and 7 were not supported. The results indicate that redundancy in the form of repeating information within a radio news story improved the recall of that information in both newscaster-delivered stories (readers) and stories with actualities. But redundancy did not improve the recall of the target story slug or the appeal of the news story.

The results also indicate that, contrary to the hypotheses, including an actuality improved recall of the target story slug. But the use of actualities did not improve recall of story information or the appeal of the target story. And the results indicate that incorporating distraction in terms of a secondary task in experiments has an effect on recall of the target story

slug and radio news story information, and on the appeal of the news story.

These effects occur somewhat regardless of the demographics of the subjects. Age and gender account for some of the variance in recall of news story information, but income and education do not. And the combined amount of variance accounted for by age and gender is about equal to that accounted for by redundancy and about half of that accounted for by distraction. The four variables together account for about 25% of the variance in recall of news story information.

Age also accounts for some of the variance in news story appeal and so does education. But gender and income do not. And the combined amount of variance accounted for by age and education is about equal to that accounted for by distraction. The three variables together account for less than 15% of the variance in news story appeal.

However, because the subjects were not randomly assigned to the treatment groups as noted above, any influence of the demographic variables may be due to assignment error and is therefore questionable. The eight treatment groups were comparable in makeup according to the gender of the subjects, but not comparable in makeup according to the education level, income level, or age of the subjects.

The results of the present study support the findings of Findahl and Hoijer (1975) by showing that redundancy, in the form of repetition of information, aids in the recall of that information, and that redundancy has no significant effect on subjects' evaluation of the general appeal of the

target news story. The present study expands on these findings by showing that redundancy has an effect on information recall in both stories without actualities, which Findahl and Hoijer (1975) used, and in stories with actualities.

Given the limited time made available to broadcast news programming, professionals may be reluctant to include much repetition in news stories. However, including a brief reformulation of the cause and consequence of an event should result in only a few seconds increase in time. And as this research has shown, including such repetition has a positive influence on information recall.

The findings also support, to a degree, research by Grady (1987) that the use of actualities in radio news stories produces no significant difference in the recall of news story information. This is largely contrary to findings by Wulfemeyer and McFadden (1985), who found that the presence of actualities had a negative effect on recall.

Curiously, use of an actuality in the present study did significantly increase the recall of the target story slug, which seems to run contrary to the absence of a significant effect on information recall. However, this may be the result of the nature of the information provided in the target story slug which was essentially a brief description of the story without details, while information recall was based on important details of the story. This may indicate that an actuality may help listeners recall that, for example, a story about a fire was included in a newscast without being able to provide

any details about the fire. The value of such generic information is questionable.

The conflict in findings may be explained in part by the nature of the newscasts used in each of the three studies. Wulfemeyer and McFadden used three of the five stories in their newscast as target stories and measured information recall on all five stories presented in two versions, with actualities and without. Grady used only one target story, but included four versions of the newscast. The target story was also presented as a voice report from a reporter at the scene of the news event in two versions, one containing background "noise" from the event and the other without such noise. Grady also measured information recall on all five stories in the newscast, but only reported results for differences in information recall for the target story in all four groups. The present study used a single target story presented either with an actuality or without and measured information recall on that story alone.

The conflicting results may also be partially due to the subjects used in each of the three studies. Both Grady and Wulfemeyer and McFadden used college students as subjects, and warn that the homogeneity of the subjects may have had an effect on the outcome of their experiments. The present study included a more heterogenous group of subjects, making the results somewhat more generalizable, and indicating that age and gender may play a role in information recall.

The results presented above also conflict with cognitive processing

research by Bugelski (1979) and Kahneman (1973) which indicated that actualities interrupt the "conversation" a newscaster has with the audience, disrupting information processing and thus inhibiting recall. So while the present study had hypothesized an actuality to be a distraction to subjects' information processing, the results indicate the actuality was not enough of a distraction to significantly inhibit information recall.

This may be due to variables not controlled for in the present study, especially the nature of the voices used in the newscast. An experienced male broadcast journalist served as the newscaster in the simulated newscast and a second male broadcast announcer provided the voice for the actuality. Perhaps the two voices were so similar that listeners did not perceive of the change in voices as a disruption. If more dissimilar voices were used the actuality may in fact serve as a distraction as hypothesized. Neither Grady (1987) nor Wulfemeyer and McFadden (1985) indicate if the actuality voices were similar or different from the newscaster voices in their studies.

The present study also found no support for the common belief in the field of broadcast journalism, that actualities add to the appeal of a radio news story. This supports findings by both Grady and Wulfemeyer and McFadden.

In light of this and other studies in this area, it would appear that the value of actualities to a radio news program may be somewhat overrated. Perhaps some study should be directed at the question of why broadcast

educators and professionals continue to advocate the use of actualities despite the lack of empirical support for them. For while actualities may not inhibit information recall, they also do not appear to enhance it. Given the effort and expenditure involved in the production and presentation of actualities, it would seem that more research is needed to determine precisely what, if any, value they have to radio journalism.

Perhaps the most significant finding in the present study is the effect of a secondary distraction activity on recall of broadcast news information. No other published research has included such an activity so it is impossible to compare results. But the present study clearly shows that a distraction activity has a negative effect on information recall and on the general appeal of a radio news story. In fact distraction explained the largest portion of the variance in information recall and story appeal accounted for in the present study. Future research on radio news should therefore definitely include such a distraction activity.

It would also be worthwhile to examine the nature of the distraction activity. The present study used cross-channel distraction in the form of a video simulation of driving a car. This indicates having subjects concentrate on a visual stimulus indeed distracts from the audio stimulus. Such findings are similar to those from research on the effect of audio-video redundancy on television news recall showing the more redundancy between the two channels, the higher the recall (Drew & Grimes, 1987; Grimes, 1991; Reese, 1984). Future studies might employ a secondary audio stimulus such as

people talking quietly, or a telephone ringing, or the clicking of a keyboard to simulate an office setting.

It might also be enlightening to examine the effect of "real-world" secondary tasks which subjects might engage in while listening to radio news. Such tasks might include meal preparation, reading a book or newspaper, or even working on a jigsaw puzzle. Using such activities would help control for the unnaturalness of the experiment setting and the intrusive nature of the controlled experimental design which often make such research less generalizable.

APPENDICES

APPENDIX A

TARGET STORY SCRIPTS

NOTE: Underlined information in the BASIC versions indicates content repeated in versions with redundancy.

I. BASIC ACTUALITY:

The Marion City Commission wants to buy part of the Duane Arnold Nuclear Power plant. Last night, the commission voted four-to-one to buy eight percent of the plant. The city will finance the purchase through the sale of 18-million dollars in bonds. Commissioner Ralph Bullard says he voted against the proposal for a number of reasons.

> BULLARD SOUNDBITE: "The main reason is that I'm basically opposed to more nuclear power plants. They're not safe. The Three Mile Island disaster, Chernobyl, and problems with reactors in Japan prove this."

Bullard says the money would be better spent on energy saving devices for city residents. The action will increase the city's long-term debt to just over 100-million-dollars.

III. BASIC READER:

The Marion City Commission wants to buy part of the Duane Arnold Nuclear Power plant. Last night, the commission voted four-to-one to buy eight percent of the plant. The city will finance the purchase through the sale of 18-million dollars in bonds. Commissioner Ralph Bullard voted against the proposal. He says the money would be better spent on energy saving devices for city residents. The action will increase the city's long-term debt to just over 100-million-dollars.

IV. READER WITH REPETITION:

The Marion City Commission wants to buy part of the Duane Arnold Nuclear Power plant. Last night, the commission voted four-to-one to buy eight percent of the nuclear plant. The city will finance the purchase through the sale of 18-million dollars in bonds. Commissioner Ralph Bullard was the only member to vote against the proposal. He says nuclear power plants are unsafe.

Commissioner Bullard also says Marion should not increase it's debt by 18-million-dollars. He says the money would be better spent on energy saving devices for city residents. The sale of the bonds will increase the city's long-term debt to just over 100-million-dollars.

APPENDIX B

NON-TARGET STORY SCRIPTS

CART: MUSIC THEME UP AND UNDER

ANNCR: Good afternoon. At 3 o'clock...it's 85 degrees under mostly sunny skies. I'm Ken Miller with this K-L-M-T News Update.

GUNPOWDER ACCIDENT Story One

Two thirteen year-old Cedarville boys may lose their eyesight after a gunpowder explosion last night. John Williams and Chris Rhodes apparently ignited some gun powder while playing with fireworks on the lawn of the Williams home. The teens are hospitalized with severe burns. Chris Rhodes aunt, Mary Rhodes, says she doesn't know where the gunpowder came from.

> MARY RHODES SOUNDBITE: "Sometimes you think your kids are old enough to know better or old enough to handle the situation. and they're laying in that bed, and they're crying, and they want their moms. they're little boys and that's sad."

Donations to a trust fund for the two teens can be sent to 10-12 Elsdon Drive...Cedarville, Iowa 5-2-1-1-6.

FATAL ACCIDENT Story Two

More details are now in about the fatal accident on Interstate-80 that snarled traffic for hours last night. The Iowa Highway Patrol says three teens from Des Moines were headed west near the Danville exit in Johnson County. Officials say they lost control on wet roads, crossed the median into oncoming traffic and smashed head-on into an eastbound car. The impact sheered their car in half. Authorities from several area agencies responded...but the three teens died at the scene. Marsha Schoenback of Davenport was driving the other car in the accident. Officials say she is in stable condition at Mercy Hospital.

NEW FACTORY Story Four

Some good news in Mount Vernon today. Skolund Wood Products has announced plans to build a new factory there. The company will manufacture a new building material to be used in pre-fabricated houses. Company officials say the expansion is the result of state tax breaks and the area's strong work force. They say construction will begin this fall. Once built, the factory will employ an additional 200 people.

ELEVATOR RESCUE Story Five

A simple elevator ride turned into an adventure this morning. Eight people were trapped in an elevator stuck between floors at Iowa National Bank's main office building. Cedarville firefighter Mike Barrett helped rescue the victims.

> BARRETT SOUNDBITE: "The people in the elevator were there for probably 20...25 minutes before we finally got the elevator secured and safteyed. We made sure the elevator car wouldn't move once we opened the car doors and then removed the people."

The bank closed for 30 minutes while rescue officials fixed the elevator. None of the people were injured, and business returned to normal shortly after 10 this morning.

Staff Meteorologist Dana Hughes says we'll have mostly clear skies this afternoon and evening...with a high in the mid-80s. Look for a low tonight in the upper 60s. Right now, it's 85 degrees.

I'm Ken Miller....K-L-M-T News.

APPENDIX C

RECRUITMENT LETTERS

Radio stations are licesened to use thé public airwaves while operating within the public interest. A radio station operator might fulfill this responsibility by keeping the public informed through local newscasts.

For my doctoral dissertation work in the School of Journalism at Michigan State University, I'm interested in learning what you think about the way radio news is presented.

So I'm requesting your assistance with an experiment. In return, I will pay participants $10 for their help. Participants in this research project will listen to a recording of a radio newscast and then answer a series of questions. Participant names will never be attached to any of the information supplied, and all of the information participants supply will remain strictly confidential.

The research will take place in the Communication Arts Building on the Michigan State University campus. The project will be conducted July 10-14 and July 17-21 in the evening with sessions beginning at 6 p.m., 7 p.m., 8 p.m., and 9 p.m. Each project session will last about 30 minutes.

If you have any questions about this project, please feel free to contact me at home at (517) 339-4579.

Thank you very much for your assistance.

Sincerely,

Larry G. Burkum
Doctoral Candidate
School of Journalism
Michigan State University

Radio stations are licesened to use the public airwaves while operating within the public interest. A radio station operator might fulfill this responsibility by keeping the public informed through local newscasts.

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So I'm requesting your assistance with an experiment. In return, I will pay participants $10 for their help. Participants in this research project will listen to a recording of a radio newscast and then answer a series of questions. Participant names will never be attached to any of the information supplied, and all of the information participants supply will remain strictly confidential.

The research will take place in Olmsted Hall on the University of Evansville campus. The project will be conducted September 11-15 in the evening with sessions beginning at 6 p.m., 7 p.m., 8 p.m., and 9 p.m. Each project session will last about 30 minutes.

If you have any questions about this project, please feel free to contact me in my office at (812) 479-2069 or at home at (812) 477-8905.

Thank you very much for your assistance.

Sincerely,

Larry G. Burkum
Doctoral Candidate
School of Journalism
Michigan State University

APPENDIX D

INFORMED CONSENT STATEMENT

This research is part of Larry Burkum's doctoral dissertation work in the School of Journalism at Michigan State University. It's purpose is to determine what you think about the way radio news is presented. The project will last for about 30 minutes. As a participant in this research project, you will listen to a recording of a radio newscast and then answer a series of questions. You may refuse to answer any questions you believe are inappropriate. Your name and/or other identifier will never be attached to any of the information you supply, and all of the information you supply will remain strictly confidential. All participants will remain anonymous in any report of the research findings.

For your voluntary participation, you will receive $10. All questions or concerns should be directed to Larry Burkum at (517) 339-4579 or Dr. Stephen Lacy at the MSU School of Journalism at (517) 355-2489.

You indicate your voluntary agreement to participate in this project by signing your name below.

_____ _____

Participant's signature Date

_____ _____

Participant's printed name Phone Number

APPENDIX E

INSTRUCTIONS READ TO SUBJECTS

INVESTIGATOR: This research is being conducted as part of Larry Burkum's doctoral dissertation. Your voluntary participation is greatly appreciated. All of the information you provide will remain strictly confidential.

I. GROUPS 1 through 4 (Distraction Absent)

INVESTIGATOR: In a moment, I will play a tape of a radio newscast from a town in Iowa. Please listen carefully to the tape. After the newscast, I will ask you a series of questions. **[PLAY TAPE]**

II. GROUPS 5 through 8 (Distraction Present)

INVESTIGATOR: Each of you is holding a toggle switch in your hand. In a moment, I will play a tape for you. The video portion of the tape simulates driving around Lansing. The audio portion contains a radio newscast from a town in Iowa. Please pay attention to the tape and watch for semi-tractor-trailer trucks passing on left. When you see a semi-tractor-trailer truck pass on the left, please flip the switch you are holding in your hand. Flip the switch each time you see a semi-tractor-trailer truck. After the tape, I will ask you a series of questions. **[PLAY TAPE]**

[READAFTERPLAYINGTAPE]

INVESTIGATOR: In a moment, I will distribute a small booklet. Please do not open it until I tell you. Please read the instructions carefully, and answer the questions to the best of your abilities. You will have 15 minutes to complete the questionnaire. A number is written on the top right corner of the cover of each booklet. This number will be used only for coding purposes when we input data into the computer. Your name will never be attached to any of this information, and all of your responses will be kept strictly confidential.

[DISTRIBUTERECALLBOOKLETS]

INVESTIGATOR: Please read the instructions carefully, and answer the questions as best you can. You have 10 minutes to complete the questionnaire. You may begin.

[READAT THE END OF 10 MINUTES]

INVESTIGATOR: Please close your booklet now. After I collect the booklets, I will have some final instructions for you. Your name will never be attached to any of this information. And all of your responses will be kept strictly confidential.

[COLLECTBOOKLETS]

APPENDIX F

INFORMATION RECALL QUESTIONNAIRE

No. _____

RADIONEWS INFORMATIONRECALLBOOKLET

Please do not open this booklet until you are instructed to do so. Please read the instructions carefully, and answer the questions to the best of your abilities. Please provide your initial response and do not go back to change any of your responses. You will have 15 minutes to complete the questionnaire. The number above will only be used for coding purposes when we input data into the computer. Your name will never be attached to any of this information. And all of your responses will be kept strictly confidential.

Please wait to open the booklet until you are told to do so.

First, we would like you to try to remember the stories you heard in the newscast. Listed below are 6 brief story descriptions. Please place a check mark to the left of each story description you remember from the newscast. Check as many story descriptions as you remember.

_____ A. Traffic accident leaves three dead

_____ B. Mayor announces re-election bid

_____ C. Local clothing store robbed

_____ D. City to buy nuclear power plant

_____ E. Fire at local restaurant

_____ F. Bank employees rescued from stuck elevator

PLEASE TURN TO THE NEXT PAGE

Now we would like you to try to remember some specific information about a story in the newscast you just heard. Each question below refers to the story about the nuclear power plant. Please circle the number of the response you believe to be the correct answer to each question. Please answer every question as best you can.

G. In what city did the story about buying the nuclear power plant take place? (Circle number of your response)

1 Arnold
2 Marion
3 Postville
4 Vinton
9 Don't Know

H. What is the name of the commissioner opposed to buying the plant? (circle number)

1 Duane Arnold
2 Jim Ireland
3 Ralph Bullard
4 Marty Plant
9 Don't Know

I. He is against buying the nuclear power plant because: (circle number)

1 it will increase the city's long-term debt.
2 it will mean a loss of jobs.
3 the city doesn't need the additional power generating capability.
4 the plant needs too much work to make it useful.
9 Don't Know

J. How will the city finance the purchase of the plant? (circle number)

1 Through a bank loan.
2 Through the sale of public land.
3 Through the use of reserve funds.
4 Through the sale of $18-million in bonds.
9 Don't Know

Now we would like to know your perceptions of a particular story in the newscast. We would like you to rate it on several bipolar scales. Please rate the story on the scales by circling the number at the appropriate spot on each scale. For example, the first scale asks you to rate the story as boring or stimulating. If you think the story is a little boring, you might circle the 3 on the scale, like this:

BORING 1 2 3 4 5 6 7 STIMULATING

But if you think the story is very stimulating, you might circle the 6 on the scale, like this:

BORING 1 2 3 4 5 6 7 STIMULATING

Do not spend a lot of time thinking about your response. We are interested in your initial reaction. We only want to know your perceptions of this one story, not the entire newscast. If you can not recall the story enough to respond on a scale, please circle the 0 in the right-hand margin.

Now please try to recall the story on the nuclear power plant. Do you think this story was:

K.	BORING	1	2	3	4	5	6	7	STIMULATING	0
L.	EASY TO UNDERSTAND	1	2	3	4	5	6	7	HARD TO UNDERSTAND	0
M.	UNIMPORTANT	1	2	3	4	5	6	7	IMPORTANT	0
N.	INFORMATIVE	1	2	3	4	5	6	7	MEANINGLESS	0
O.	HARD TO FOLLOW	1	2	3	4	5	6	7	EASY TO FOLLOW	0
P.	INTERESTING	1	2	3	4	5	6	7	UNINTERESTING	0
Q.	COMPLICATED	1	2	3	4	5	6	7	SIMPLE	0
R.	REPETITIOUS	1	2	3	4	5	6	7	VARIED	0
S.	THOROUGH	1	2	3	4	5	6	7	SUPERFICIAL	0
T.	EASY TO REMEMBER	1	2	3	4	5	6	7	HARD TO REMEMBER	0

Finally, we would like you to provide some basic demographic information to help us interpret the results of this experiment. Your name will never be attached to any of this information. And all of your responses will be kept strictly confidential.

U. What is your gender? (Please circle number of your response)

1 MALE
2 FEMALE

V. What is the highest level of education that you have completed? (Circle number)

1 ELEMENTARY SCHOOL OR LESS
2 SOME HIGH SCHOOL
3 HIGH SCHOOL GRADUATE
4 COMPLETED TRADE OR TECHNICAL SCHOOL
5 SOME COLLEGE
6 GRADUATED WITH A BACHELOR'S DEGREE
7 SOME GRADUATE OR LAW SCHOOL
8 GRADUATED WITH LAW DEGREE
9 GRADUATED WITH MASTER'S OR Ph.D. DEGREE

W. In what year were you born? (Please write response in the space below)

_____

X. What is the your personal annual income, before taxes? (Circle number)

1 LESS THAN $5,000
2 $5,000 to $9,999
3 $10,000 TO $19,999
4 $20,000 TO $29,999
5 $30,000 TO $39,999
6 $40,000 TO $49,999
7 $50,000 TO $59,999
8 $60,000 TO $69,999
9 $70,000 TO $79,999
10 $80,000 TO $89,999
11 $90,000 TO $99,999
12 $100,000 OR MORE

Is there anything else you can recall about the newscast you heard? Please write anything else you recall about the newscast in the space below. Or if you would like to comment on any part of the newscast, this questionnaire, or this project, please do so in the space below.

Thank you for completing the questionnaire. Please close your booklet and sit quietly until the booklets are collected. You will then receive some final instructions. Your name will never be attached to any of this information. And all of your responses will be kept strictly confidential.

APPENDIX G

DEBRIEFING INSTRUCTIONS

INVESTIGATOR: This study has been undertaken as part of Larry Burkum's doctoral dissertation. Its purpose is to determine the effect of different presentation styles on your ability to recall radio news. The information you have provided will be compared to information by others who have heard different presentation methods. This study is ongoing, so please do not discuss it with anyone.

The number on the booklets will be used for coding purposes when we input data into the computer. Your name will never be attached to any of this information. And all of your responses will be kept strictly confidential.

Your participation has been a great help. If you have any questions or comments about this research, please contact Larry Burkum at (517) 339-4579, or Dr. Stephen Lacy at (517) 355-2489. Thank you for your assistance. Goodbye.

LIST OF REFERENCES

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Agresti, A. & Agresti, B. F. (1979). Statistical methods for the social sciences. San Francisco: Dellen.

Bernard, R. M., & Coldevin, G. O. (1985). Effects of recap strategies on television news recall and retention. Journal of Broadcasting & Electronic Media, 29, 407-419.

Berry, C. (1983a). A dual effect of pictorial enrichment in learning from television news: Gunter's data revisited. Journal of Educational Television, 9, 171-174.

Berry, C. (1983b). Learning from television news: A critique of the research. Journal of Broadcasting, 27, 359-370.

Bittner, J. R. (1981). Professional broadcasting: A brief introduction. Englewood Cliffs, NJ: Prentice-Hall.

Broadbent, D. E. (1958). Perception and communication. London: Pergamon Press.

Bugelski, B. R. (1979). Principles of learning and memory. New York: Praeger.

Burriss, L. L. (1988). Use of audio inserts in network radio newscasts. Journalism Quarterly, 65, 474-478.

Charnely, M. V. (1948). News by radio. New York: MacMillan.

Chu, G., & Schramm, W. (1967). Learning from television: What the research says. Washington, DC: National Association of Educational Broadcasters.

Clugston, G. W. (1992). How actualities affect radio news recall: A study of dramatic versus non-dramatic actualities. Unpublished master's thesis, Michigan State University, East Lansing.

Cook, T. D., & Campbell, D. T. (1979). Quasi-experimentation: Design and analysis issues for field settings. Boston: Houghton Mifflin.

Davis, D. K., & Robinson, J. P. (1986). News story attributes and comprehension. In J. P. Robinson & M. R. Levy (Eds.), The main source: Learning from television news (pp. 179-210). Beverly Hills, CA: Sage.

DeFleur, M., Davenport, L., Cronin, M., & DeFleur, M. (1992). Audience recall of news stories presented by newspaper, computer, television and radio. Journalism Quarterly, 69, 1010-1022.

Dommermuth, W. P. (1974). How does the medium affect the message? Journalism Quarterly, 51, 441-447.

Drew, D., & Grimes, T. (1987). Audio-visual redundancy and TV news recall. Communication Research, 14, 452-461.

Fang, I. E. (1980). Television news, radio news. St. Paul, MN: Rada Press.

Findahl, O., & Hoijer, B. (1975). Effect of additional verbal information on retention of a radio news program. Journalism Quarterly, 52, 493-498.

Gibson, R. (1991). Radio and television reporting. Boston: Allyn and Bacon.

Goleman, D. (1978). A taxonomy of meditation-specific altered states. Journal of Altered States of Consciousness, 4 (2), 203-213.

Graber, D. A. (1988). Processing the news: How people tame the information tide. New York: Longman.

Grady, L. (1987). How voice reports, actualities affect recall of radio news. Journalism Quarterly, 64, 587-590.

Grimes, T. (1990). Audio-video correspondence and its role in attention and memory. Educational Technology Research and Development, 38(3), 15-25.

Grimes, T. (1991). Mild auditory-visual dissonance in television news may exceed viewer attentional capacity. Human Communication Research, 18, 268-298.

Gunter, B. (1980). Remembering televised news: Effects of visual format on information gain. Journal of Educational Television, 6, 8-11.

Gunter, B. (1985). News sources and news awareness. A British survey. Journal of Broadcasting, 29, 181-201.

Gunter, B. (1987). Poor reception: Misunderstanding and forgetting broadcast news. Hillsdale, NJ: Lawrence Erlbaum.

Gunter, B., Furham, A., & Gietson, G. (1984). Memory for the news as a function of the channel of communication. Human Learning, 3, 265-271.

Hall, M. W. (1986). Broadcast journalism: An introduction to news writing (3rd ed.). Boston, MA: Hastings House.

Hausman, C. (1992). Crafting the news for electronic media. Belmont, CA: Wadsworth.

Herbert, J. (1976). The techniques of radio journalism. London: Adam and Charles Black.

Hewitt, J. (1995). Air words: Writing for broadcast news. Mountain View, CA: Mayfield.

Hsia, H. J. (1971). The information processing capacity of modality and channel performance. AV Communication Review, 19(1), 51-75.

Jorgensen, E. (1955). The relative effectiveness of three methods of television newscasting. Unpublished doctoral dissertation. University of Wisconsin, Madison.

Kahneman, D. (1973). Attention and effort. New York: Holt, Rinehart, & Winston.

Levy, M. (1978). The audience experience with television news. Journalism Monographs (No. 55).

Lord, F. M. (1963). Elementary models for measuring change. In C. W. Harris (Ed.) Problems in measuring change. Madison, WI: University of Wisconsin Press.

Maccoby, E. E. & Jacklin, C. N. (1974). The psychology of sex differences. Stanford, CA: Stanford University Press.

Mayeux, P. E. (1991). Broadcast news: Writing and reporting. Dubuque, IA: William C. Brown.

Moray, N. (1969). Listening and attention. Hammondsworth, England: Penguin Books.

Norusis, M. J. (1990). SPSS/PC+ statistics 4.0 for the IBM PC/XT/AT and PS/2. Chicago: SPSS, Inc.

O'Donnell, L. B., Benoit, P., & Hausman, C. (1995). Modern Radio Production (4th ed.). Belmont, CA: Wadsworth.

Pease, E., & Dennis, E. (1995). Radio: The Forgotten Medium. New Brunswick, NJ: Transaction Publishers.

Perloff, R. M., Wartella, E. A., & Becker, L. B. (1982). Increasing learning from TV news. Journalism Quarterly, 59, 83-86.

Posner, M. J. (1982). Cumulative development of attentional theory. American Psychologist. 37, 168-179.

PR Newswire. (1996). Local TV tops networks and newspapers as leading source of news. In Don Fitzpatrick Associates Shoptalk, December 16, 1996. HTTP://www.tvspy.com.

Reese, S. D. (1984). Visual-verbal redundancy effects on television news learning. Journal of Broadcasting, 28, 79-87.

Robinson, J., & Levy, M. (1986). Comprehension of a week's news. In J. P. Robinson & M. R. Levy (Eds.), The main source: Learning from television news. Beverly Hills, CA: Sage.

Roper Organization. (1985). Public attitudes toward television and other media in a time of change. New York: Television Information Office.

Severin, W. (1967). The effectiveness of relevant pictures in multiple-channel communications. AV Communication Review, 15, 386-401.

Severin, W. (1968). Cue summation in multiple-channel communication (Technical Report No. 37). University of Wisconsin, Madison, Wisconsin Research and Development Center for Cognitive Learning.

Shannon, C., & Weaver, W. (1949). The mathematical theory of communication. Urbana, IL: University of Illinois Press.

Shiffrin, R. M., & Schneider, W. (1977). Controlled and automatic human information processing: II. Perceptual learning, automatic attending and a general theory. Psychological Review, 84, 127-190.

Shook, F., & Lattimore, D. (1987). The broadcast news process (3rd ed.) Englewood, CO: Morton.

Singer, J. L. (1980). The power and limitations of television: A cognitive-affective analysis. In P. H. Tannenbaum (Ed.), The entertainment functions of television. Hillsdale, NJ: Lawrence Erlbaum.

Son, J., Reese, S. D., & Davie, W. R. (1987). Effects of visual-verbal redundancy and recaps on television news learning. Journal of Broadcasting & Electronic Media, 31, 207-216.

Stephens, M. (1993). Broadcast news (3rd ed.). New York: Holt, Rinehart, & Winston.

Tabachnick, B. G., & Fidell, L. S. (1989). Using multivariate statistics (2d ed.). New York: Harper Collins.

U.S. Census Data. (1990). Database C90STF3CI, Michigan, http://venus.census.gov/cdrom/lookup/853329501.

Wickens, C. (1984). Processing resources in attention. In R. Parasuraman & D. Davies (Eds.), Varieties of attention. New York: Academic Press.

Wilson, C. E. (1974). The effect of medium on loss of information. Journalism Quarterly, 51, 111-115.

Wimmer, R. D., & Dominick, J. R. (1994). Mass media research: An introduction (4th ed). Belmont, CA: Wadsworth.

Wulfemeyer, K. T., & McFadden, L. L. (1985). Effects of actualities in radio newscasts. Journal of Broadcasting & Electronic Media, 29, 189-193.

Yoakam, R. D., & Cremer, C. F. (1985). ENG: Television news and the new technology. New York: Random House.