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# THE EFFECTS OF NEWSPAPER ACCOUNTS OF NUCLEAR POWER INCIDENTS ON READER UNDERSTANDING AND ATTITUDE: AN EXPERIMENT

A Dissertation

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Degree

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Alice Lois Gagnard

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To my parents

ABSTRACT

Purpose of the experiment was to compare effects of different newspaper accounts of nuclear power accidents on reader understanding and attitude. Random samples of 20 each from a college class judged four versions of stories about nuclear power accidents. Each story contained one condition of two independent variables--presence or absence of mention of radiation leakage and presence or absence of a "No Harm Done" caveat downplaying the accident's consequences. Judgments on 11 semantic scales tapped the evaluative dimension of meaning. A control group judged the concept "Newspaper Articles About Nuclear Power Plant Accidents."

General hypotheses predicted that articles about radiation leaks would be judged more "serious" (threatening, unpleasant, exciting, etc.) than those not involving radiation, and that articles without "No Harm Done" statements would be judged more serious than those with such statements. Results showed judgments on the Nonthreatening/Threatening scale drew significantly different responses in line with general hypotheses, and several other scales were directionally consistent with hypotheses, but not statistically significant. On four scales the control group judged the concept of nuclear articles significantly more "serious" than treatment groups judged their articles, giving rise to a "No News is Bad News" explanation as one possible reason for the results. Factor analysis of the semantic scales yielded three item clusters labeled "Conclusive" (Complete/Incomplete, Definite/Uncertain, Clear/Unclear, Good/Bad); "Negative-Evaluative" (Optimistic/Pessimistic, Positive/

Negative, Pleasant/Unpleasant, Calming/Exciting, Nonthreatening/Threatening); and "Priority" (Important/Unimportant, Meaningful/Meaningless). On Factor II, Negative-Evaluative, the control group again was found to differ significantly from treatment groups.

Closer examination of "nuclear power sentiment" of the treatment groups revealed that Group 4 (With Radiation, With "No Harm Done") had a decidedly anti-nuclear bias, which could account for the nonsignificance between its responses and those of Group 3 (With Radiation, Without "No Harm Done"). Another explanation posited for the inconsistent results was failure of participants to recognize and respond to components of the articles; results could reflect generalized responses to nuclear news.

A separate sample of 16 subjects participated in a Q-sort procedure to describe attitudes toward nuclear power.

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# CHAPTER I

## INTRODUCTION AND JUSTIFICATION

One of the most lasting reverberations of the World War II devastation of Nagasaki and Hiroshima has been the ensuing national debate over the issue of nuclear power. Since 1945, the United States and other countries have wrestled with the scientific, political, psychological, and moral considerations of what is felt by many to be man's ultimate means of self-destruction.

Although this study does not focus on nuclear weaponry, but rather nuclear power reporting, it is important to understand the historical progression of the use of nuclear materials in this country and its effect on public perception of the nuclear industry some 35 years later.

The subject of nuclear power, at the same time both highly technical and emotional, has posed a great challenge to the mass media--one of whose functions Lasswell (1948) terms "surveillance of the environment." In the case of nuclear-related incidents, the mass media provide citizens with what is in most cases their only information of the event. The purpose of this study is to examine the effects of various accounts of nuclear power plant incidents on how readers understand and feel about them.

The specific area of nuclear reporting is best understood, as are most communication problems, when viewed as a point or process in the overall communication process. Some of the basic models of communication provide ready perspectives. Westley and MacLean (1957) represented mass media communication as a sender choosing among an endless number of available messages which he sent through a channel to a large and diverse

audience. Lasswell (1949) proposed a vertical representation of the communication process with his model of

Who

Says What

In Which Channel

To Whom

With What Effect?

In the case of science news in the mass media, much has been published on the who (source), what (message), which channel (medium), and the whom (receiver). Some of these studies will be discussed in the Review of Literature. For example, several authors have written that reporters who handle stories on environmental issues generally are poorly qualified in terms of background to communicate such topics effectively.

The topic of nuclear accidents is not easily covered--it involves highly technical, political, economic, and emotional issues. It represents a major challenge to the news media who relay nuclear-related information to a diverse public. For many, mass media furnish the only source of information on science news. Of the various media, newspapers were the single most important source of science information in a study in the 1960's (Ubell, 1963).

Those who study environmental news seem to agree on at least two points: the first, that the subject matter is complex, has been mentioned. An energy seminar sponsored by the Harvard Business School pointed out that in reporting nuclear-related news, the press often is confused because experts themselves are confused. The second point is that nuclear information is highly important to readers, but often misunderstood by them. From the reporter's point of view, one of the

major difficulties of science writing is determining interest and comprehension patterns on the part of a large and diverse audience.

The incident at Three Mile Island was a commentary not only on the preparedness of that power plant's staff, but also of the ability of the news media, to deal with a nuclear accident. Reverberations which reached the nuclear industry and press were many, not the least of which was a recommendation by the President's Commission on the Accident at Three Mile Island, which said:

> All major media outlets...(should)...hire and train specialists who have more than a passing familiarity with reactors and the language of radiation. All other news media...near nuclear power plants...should attempt to acquire similar knowledge. (p. 79)

In the case of Three Mile Island, evidence abounded to substantiate charges that media coverage was often inaccurate or distorted. This allegation was not new to science writing; at least one study has found that most science articles are inaccurate in some way (Tankard and Ryan, 1974). It is the opinion of this author that the day-to-day reporting of relatively minor nuclear power plant incidents is not inaccurate per se, but rather is in many cases partial in terms of factual content and lacking in context. This argument is buttressed with examples from daily newspapers, primarily those in the Knoxville area. Accuracy aside, it seems that such stories often are incomplete in terms of the cause and consequence of a power plant accident.

Against the backdrop of dependency theory, which will be discussed in more detail in the section on Theoretical Perspectives, it would seem that the media serve as the only source of information on a topic, and if that information is incomplete or misunderstood, the audience will likely suffer a kind of ambiguity caused by conflicting or

confusing media messages. It is the purpose of this study to assess the effects of different versions of articles about nuclear power plant incidents on reader understanding and attitude. Given the implications of dependency theory on affective and behavioral matters, it would be useful to initiate the first experimental research toward answering the "With What Effect" portion of Lasswell's paradigm with respect to nuclear reporting.

# CHAPTER II

## REVIEW OF THE LITERATURE

The following discussion of articles, books, and individual studies is the result of a search of the literature in the University of Tennessee libraries. A single computer search using the Social Sciences Citation Index yielded a handful of articles and studies, which will be discussed. Key words used in the search included:

nuclear

radiation

accident

Three Mile Island

atomic

reporting

journalism

news

A manual search of the card catalog was made for sources on the nuclear debate, communication theory, and methodology. Manual searches of the communications journals, Journalism Abstracts, Dissertation Abstracts, and other sources yielded considerable information on the topic of environmental reporting. Discussion of literature about methodological concerns is included in Chapter III.

### The Nuclear Energy Issue

The debate over issues related to the use of radioactive materials represents one of the foremost social concerns of modern times. A technology which in its infancy involved only a handful of scientists has risen to the foreground of public thought and political action. The

lack of public consensus on the issue of nuclear energy is not surprising when one considers the startling polarization of opinion even among scientists of apparently equal eminence.

The nuclear energy controversy in the United States spans a number of individual issues the solutions to which can serve as an index of basic nuclear power supportiveness or non-supportiveness on the part of an individual or group. Myers (1977) offered simplified encapsulated arguments from both sides of the nuclear fence:

> Supporters argue that U.S. and world demand for energy is growing, and that nuclear power offers the best means--outside of coal--of meeting this demand. They say that development of nuclear power is critical to the reduction of U.S. dependence of foreign oil and to the preservation of scarce domestic petroleum reserves for non-power purposes. They describe nuclear plants as safe, cheap, and reliable. Moreover, they claim that the safety of nuclear power is guaranteed by industry's programs of quality control by stringent government regulation. Unless nuclear power is developed, they assert, the United States will most likely face blackouts, a decline in industrial growth, an increase in unemployment, and a reduced standard of living.
>
> Opponents argue that the development of nuclear power involves extreme dangers as a result of possible power-plant malfunctions or misuse of radioactive materials. There is no need to risk these hazards, they say, because U.S. and world needs can be met economically through conservation and other sources of supply. Moreover, they contend, industry and government have been more interested in promoting than in policing nuclear power and, as a consequence, the public interest is not being protected. (p. 3-4)

While it was not the intent of this study to re-enact a nuclear energy debate, it is recognized that any analysis of media content on a particular issue or of reader reaction to that content must be viewed against a backdrop of public opinion and sentiment of the times.

In the area of public opinion research on the subject of nuclear energy policy, the Gallup Poll offers an insight into opinions held by a cross-section of Americans. In a poll taken in January 1980, the Gallup

organization found that a majority of those polled favored a "go slow" approach to nuclear plant operation. When asked the question "Do you feel that nuclear power plants operating today are safe enough with the present safety regulations, or do you feel that their operations should be cut back until more strict regulations can be put into practice?", 55 percent said they favored cutting back, while 30 percent said they felt the plants are safe enough as they are.

The 1980 responses represent a slight increase of favorable sentiment toward present operation of nuclear power plants. Sixty-six percent of those answering the same question in April 1979 indicated the need for more strict regulation while 24 percent said operations were already safe enough. A closer analysis of the data reveals a sharp division of opinion on political party lines--sixty percent of those belonging to the Democratic Party favored cutbacks in 1980, compared with 43 percent of Republican Party members. Those living in the eastern portion of the country were more likely to favor cutbacks, as were those with more education.

A 1976 poll using the same question shows that only 40 percent of those interviewed said they felt cutbacks were necessary, while 34 percent said plants were operating safely. The substantial rise in negative sentiment toward nuclear power plant operation was effected largely by the reactor accident at the Three Mile Island facility in Harrisburg, Pa., in March 1979. Indeed many authors have dichotomized American public opinion on the issue of nuclear power into that which was prevalent before and after that single event.

While a report by the President's Commission on the Accident at Three Mile Island concluded that radiation released in the incident

"did not pose a serious health problem to area residents" and that "there was never the danger of the nuclear reactor exploding," the confusion, panic, and misunderstandings that accompanied the event reached proportions which will not soon be forgotten.

The period of three days beginning March 8, 1979, will have been the subject of some 16 federal, state, and private studies by the year 1990, and will also be the focus of scores of other analyses, articles, and debates at all levels of society and government (Edwards, 1980). Most of these studies probably would agree that the event itself resulted in a string of communication faux pas beginning with confusing internal plant information flow, followed by ambiguous, contradictory, and often sensationalized media coverage of the widely publicized accident.

According to the President's Commission, the "major health effect (of Three Mile Island)...was...mental stress." Observers of the event have coined their own terms for the effect. "Psychological fallout" is what Edwards called the most significant impact Three Mile Island had on public health. A 1980 article in Science News refers to the "emotional residue" which lingered in the minds of American citizens one year after the accident. R.L. DuPont (1981) classifies a batch of fears he collectively refers to as "nuclear phobia" which gripped the public mind after Three Mile Island.

The themes of lack of information and lack of communication surface repeatedly in analyses of the events leading up to and after the accident itself. Victor Gilinsky (1980) refers to March 1979 as a period in which the American public and the rest of the world was "treated to a quick course on what can go wrong with nuclear reactors."

That the public and the press are in need of education in nuclear matters seems to be a widely held attitude among industry and regulatory personnel. In a statement before the Commonwealth of Pennsylvania in 1973, consumer activist Ralph Nader said that "if people knew what the facts were and if they had to choose between nuclear reactors and candles, they would choose candles." Fenn (1980) cites the subjective nature of highly technical scientific issues involved with nuclear power as a major hurdle to public understanding and acceptance of that energy form.

The incident at Three Mile Island highlighted the confusion over fact and fiction in nuclear matters. In its final report, the President's Commission noted that "during the accident, official sources of information were often confused or ignorant of the facts. News media coverage often reflected this confusion and ignorance." (p. 57) The report stated that "reporters who covered the accident had widely divergent skills and backgrounds. Many had no scientific background."

> ...the news media had difficulty presenting this information to the public in a form that would be understandable...This difficulty was particularly acute in the reporting of information on radiation releases. (p. 58)

In its recommendations, the Commission said:

> The coverage of nuclear emergencies places special responsibilities on the news media to provide accurate and timely information. The Commission therefore recommends that:
> All major media outlets (wire services, broadcast networks, news magazines, and metropolitan daily newspapers) hire and train specialists who have more than a passing familiarity with reactors and the language of radiation. All other news media, regardless of their size, located near nuclear power plants should attempt to acquire similar knowledge or make plans to secure it during an emergency.
> Reporters discipline themselves to place complex information in a context that is understandable to the public and that allows members of the public to make decisions regarding their health and safety. (p. 79)

The importance of delivering factually based and understandable information to news media in the event of nuclear emergencies was

cited also by the Nuclear Regulatory Commission's Special Inquiry Group in its Rogovin Report, named after the group's director.

As a result of the Three Mile Island Experience, the Nuclear Regulatory Commission now requires a program of public education and information and provisions for informing the media as part of its Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants.

Articles on Nuclear Coverage

A search of materials in communications periodicals produced several articles dealing with science writing and science news, a few of which employed bonafide research designs. However, most of those dealing with nuclear-related journalism were anecdotal or impressionistic in nature. Many of these articles were written by newsmen who covered the incident or later studied it (see Sandman and Paden, 1979; Klucsik, 1980; Krieghbaum, 1979).

An exception to the latter category of articles is a content analysis by Nimmo and Combs (1981) of network television reporting styles used in coverage of Three Mile Island. The results indicated marked variations in styles used, a fact the authors suggest could have given viewers widely different impressions of the accident depending on which network they relied on for news. Units of analysis were entire news stories, and classifications for the study were:

> (1) effect-modeling with ambiguous content wherein broadcasters are involved emotionally with their audience, emphasizing emotion-laden cues over concrete informational content. (2) effect-modeling and clear content, yielding a sense of audience involvement in the reporter's presentation yet providing informational rather than emotional cues. (3) effect-contrasting and clear content, with broadcasters detached and removed in manner and emphasizing specific information in

> reports. (4) effect-contrasting and ambiguity that combines reportorial detachment with no clear emotional cues and confusing or even conflicting information. (p. 290)

The authors suggest that further research be done to examine different information and stylistic variables, noting that varying stylistic approaches to any issue may well lead viewers to form different impressions. One question they mention but could not answer due to the limitations of their research design was "do viewers respond in different ways to such stylistic variations?"

Another study using content analysis methodology is that of Stephens (1980), who found press coverage of nuclear power to be generally positive from 1950-1980 by a margin of three-to-one. He cites generally favorable public opinion toward nuclear power as evidence of an agenda-setting function of the press with respect to nuclear energy, rather than an attitude-change function.

Articles on Science Writing

Several articles were located which discussed the science writer and his training.

A 1973 survey by Witt of 54 environmental reporters on U.S. daily newspapers found that fewer than half were designated officially as environmental reporters and only 16 were full-time environmental reporters. Witt cited poor training and lack of environmental reporting manpower as reasons why reporting on that topic has not improved.

Ryan and Dunwoody (1975) polled 197 members of the National Association of Science Writers to examine training patterns of members of that field. Among other findings, the study revealed that science writers recommended significantly more content areas for those entering the field than they had studied themselves. Not surprisingly, the

study found that on the whole science writers today are better educated than a similar study revealed about their 1940 counterparts. A plea for more and better science news reporters was made by Myers (1979), who recommended that training encompass, in addition to liberal arts coursework, on-the-job training and maintaining contacts in the field. Fraley (1963) described the "vastness" of the science beat, and urged an individual tailoring approach to training for a science writing position.

Studies in Science Communication

More closely related to the study proposed in this paper are articles about science writing and its effects. Funkhouser and Maccoby (1973) manipulated stylistic variables in articles containing the same science-related information. Independent variables were number of words per sentence, percentage of non-Dale words (from the Edgar Dale and Jeanne Chall Readability Formula), percentage of scientific terms, and percentage of activity words. Each subject was given a random selection of three stories, one on each topic--enzymology, polymer chemistry, and plasma physics--before filling out an information test and attitude items. The attitude measures, which used the semantic differential, included the bipolar adjectival pairs of unsuccessful/successful, unimaginative/imaginative, theoretical/practical, harmful/beneficial/ uninteresting/ interesting, meaningless/meaningful, unimportant/important, irrelevant to me/ relevant to me, incomprehensible/comprehensible, untimely/timely. Subjects were chosen to represent three levels of audience: low science aptitude (volunteer students at a junior college); medium science aptitude (volunteer students at a "prestige" university),

and high science aptitude (professional scientists). Results indicated that differences in style can result in measurable differences in effects on educated lay audiences, and that "simplified" writing is appreciated at all levels of science expertise.

Early studies of science information-seeking from television revealed (1) that viewers used entertainment programming as sources of science news more than they did exclusively scientific programs (Survey Research Center, University of Michigan, 1958), and (2) that medicine and psychology made up the bulk of science information available through television programming (Sherbourne, 1963).

Failure of American news media consumers to "internalize" science was the subject of a study by Robinson (1963). Internalization was defined as "incorporating something within the mind or personality; adopting as one's own the ideas, practices, statements, or values of another person or of society." Robinson sought to determine whether (1) scientists were understood and accepted and (2) whether "research credibility" of science is highly uneven. On the first point, people who said they did not understand scientific information (40 percent) gave two reasons: first, they felt they were not intelligent enough to grasp the information; second, they felt they lacked knowledge of technical terms and jargon. Aside from finding that credibility of scientific information was higher for the physical sciences than for the medical or social sciences, Robinson reported that people are better able and more willing to judge and react to events depicted in headlines that are familiar. The author also found a strong tendency on the part of people to question scientific material regardless of what specific category it fell into.

A study by Johnson (1963) found that different audiences of science stories use different "dimensions of judgment," specifically those of accuracy, readability, and excitement, in evaluating content. Groups of scientists, editors, writers, readers, and non-readers were given sets of stories which they rates on a series of 25 semantic differential scales. The scales used were: valuable/worthless, colorless/colorful, heavy/light, accurate/inaccurate, unexciting/exciting, clear/confusing, far/near, scientific/unscientific, harmful/helpful, new/old, weak/strong, adequate/inadequate, boring/interesting, rash/cautious, easy/difficult, realistic/unrealistic, low brow/high brow, significant/insignificant, passive/active, simple/complex, irresponsible/responsible, specific/vague, unsensational/sensational, threatening/reassuring, important/unimportant. Results showed that all groups except the editors had as top priority an evaluation-accuracy factor. Evaluative judgments of the editors were independent of judgments of accuracy. Scientist, science writer, reader, and non-reader displayed similar dimensions of judgments for science news stories, while the editors made different judgments. Specific judgments, on the other hand, were found to be similar among all groups. Johnson explained the differences in findings to the emphasis various groups place on separate dimensions of stories, rather than specific judgments of individual stories.

Several studies have dealt with perceptions of accuracy on the part of readers and scientists. Tichenor et al. (1970) presented science news studies to subjects in a field setting then asked them to recall what they had read. A group of reporters and scientists whom the stories quoted then ranked the accuracy of the reader recall responses using a seven-point scale of accuracy.

Tankard and Ryan (1974) compiled 42 error categories on which science stories from 20 newspapers east of the Mississippi River with circulations larger than 50,000 were judged by a group of 193 scientists. Data-gathering method was a four-page mail questionnaire. The mean number of errors reported by the scientists was 6.22 per story, substantially higher than previous studies of general news accuracy which reported error-per-story scores of .77 (Charnley, 1936), .86 (Brown, 1965), 1.52 (Berry, 1967), and 1.17 (Blankenburg, 1970). Complaints ranged from minor wording matters (inappropriate use of the word "breakthrough" in describing research on the treatment of psoriasis) to serious factual inaccuracies. More than 75 percent of scientists responding to the survey agreed that information crucial to the understanding of research results often is omitted from news stories.

Studies of Cancer Communication

Media coverage of health information is an area of science writing which has been the focus of several studies, most of which involve testing hypotheses from attitudinal-behavioral models such as those of Fishbein and Triandis. These studies have examined the effects of exposure to health services utilization information through mass media or interpersonal sources of subsequent health-science-seeking behavior. An example of these studies is a 1977 project by Siebold and Roper in which behavioral expectancy models were found to be accurate predictors of health-science-seeking behavior related to cervical cancer detection.

Those who report on the subject of cancer share some of the same problems faced by writers of nuclear news--both subjects are highly technical and emotional. There often exists no consensus among experts

in either field on many of the major issues. In such areas where ongoing scientific research results in frequent discoveries and breakthroughs which often are reported by mass media, it is a challenge to the science writer to place such information in perspective for the reader.

A study funded by the National Cancer Institute provided a content analysis of cancer-related newspaper stories from 49 U.S. daily newspapers between August and October 1977 (Greenberg et al., 1977). Of the 2,000 stories coded, it was found that items having high priority by cancer communicators as potential "dispellers" of public misconceptions about the disease were lacking. Another finding was that the incidence of stories about cancer by specific body site did not parallel actual incidence in the population.

The authors concluded that daily newspaper coverage of cancer topics could be reinforcing negative public perceptions and misconceptions about cancer, rather than changing them. The vast majority of stories analyzed lacked basic information to place the disease in perspective in terms of incidence rates, prevention, and control. The fast-breaking nature of many cancer-related stories contributed to what the authors termed "fragmented and ephemeral' reportage, which they said may seriously affect public understanding of the much misunderstood disease. Another author also concluded that the press has done a poor job of covering cancer (Lee, 1976).

## Theoretical Perspectives

The idea that society is heavily dependent on mass media for information about the outside world has been reflected in mass communication

theory and theories of socialization. Among the classic four functions of the press identified by Wright (1960) is the activity of watching over the environment. Lasswell (1948) referred to this news function as "surveillance." The news or information function of mass media is cited also in studies having a uses and gratifications theoretical approach to studying audience utilization of media content.

A portion of a fairly recent general theory of mass communication effects by Ball-Rokeach and DeFleur (1975) dealing with the information function of mass media seems appropriate as a theoretical grounding for this study. Specific emphasis will be placed on the informational components of the theory.

Ball-Rokeach and DeFleur note the absence of a general theory of mass communication effects on individuals and society. Specific theories of effects have been proffered and tested, such as the effects of television violence on children's behavior and the effects of mass media campaigns, but an overall theory is lacking.

Mass communication theory seems to have come full circle with respect to audience effects. Early research, which employed a stimulus-response direct effects assumptions, especially those studies involving propaganda messages, were replaced by those which emphasized social categories and personality variables. Theoretical thrusts then focused on the interaction of interpersonal and mass communication, minimizing the effects of mass media messages. As if to reject all previously endorsed presumptions about media impact on attitudes and behavior, agenda-setting theory emerged and with it the minimal effects belief--on affective and behavioral counts at least. Agenda-setting studies concluded that the media, while they cannot dictate what the audience thinks, can at least order what they think <u>about</u>.

Rather than limit media impact discussion to a few mutually exclusive approaches, Ball-Rokeach and DeFleur propose an "integrated theory" of effects of mass communications. Classic theoretical analyses of societal complexity are cited as evidence that a theoretical foundation exists for significant mass media effects. Included are Durkheim's structural complexity theories, Tonnies's Gemeinschaft-Gesellschaft typology, and Marx's dialectical mechanisms. According to Ball-Rokeach and DeFleur, the sociological theories, which preceded the appearance of the mass media, signaled the rise of unfulfilled needs for information in growing societies. Taking that logic a few steps further, the authors state that "people become dependent on media external to their groups when informal channels beyond their immediate groups begin to be disrupted." (p. 260) The result is that people become increasingly less aware of what is happening in society outside of their own position in the social structure. The authors cite a high level of dependence of audiences on mass media information in urban-industrial societies. Dependency theory, then, postulates that the degree of audience reliance on media information is essential to an understanding of the extent of message effects on audience beliefs, feelings, or behavior.

The basic propositions of dependence theory are as follows:

> The potential for mass media messages to achieve a broad range of cognitive, affective, and behavioral effects will be increased when media systems may serve many unique and central information-delivery functions. That potential will be further increased when there is a high degree of structural instability in the society due to conflict or change. We need to add, however, the idea that altering audience cognitive, affective, and behavioral conditions can feed back in turn to alter both society and the media. This is what...(is)... meant by a tripartite relationship between media, audience and society. (p. 263)

Audience members are affected by media messages by way of cognitive, affective, and behavioral changes. Particularly appropriate to the proposed study of nuclear-related articles and their readers is the cognitive concept of ambiguity as defined by Ball-Rokeach and DeFleur. Ambiguity is defined as "a problem of either insufficient or conflicting information." (Ball-Rokeach, 1973) The importance of studying ambiguity as related to mass media messages can be summed up as follows: In a highly mediated environment characteristic of an advanced society, people rely on mass media for reports of a multitude of occurrences outside their immediate realm of experience. When media reports are (1) incomplete or (2) conflicting, ambiguity is likely to be present in the audience. The authors contend that it is the media's role to resolve ambiguities in modern society's informational diet. Ambiguity, if left untreated or unresolved, can persist for days or even years. In reconstructing reality for a mass audience, the media can contribute to both ambiguity resolution and formation.

# CHAPTER III

## METHODS

The research design for the study was a laboratory experiment. In addition, a Q-sort procedure was carried out with a sample from the same population as the experiment.

### Newspaper Article Experiment

By definition, the laboratory experiment is an experimental design executed in a non-naturalistic environment (Haskins, 1968), one which permits a great deal of control and constancy of environmental conditions.

According to Haskins, laboratory experiments testing communications effects almost always satisfy the experimental design requirements for internal validity. Internal validity is in the logic of the design, which should control extraneous variables in order to show cause and effect. The desired information from the study involved effects of a communications variable--in this case newspaper articles--hence the laboratory experiment was chosen as an appropriate design.

The design fit the classification by Stanley (1965) of "true" experimentation, from which strong inference can be made. It included the following elements as listed by Haskins:

1. An independent variable under control of and manipulated by the researcher.
2. Random assignment and distribution of various treatments of subjects, including a control or normative group for comparison.

3. Observation or measurement of one or more dependent variables in the treatment and control groups.

Research Plan

A laboratory experiment was carried out to assess the effects of different newspaper accounts of nuclear power plant accidents on audience understanding and attitude. Using the Haskins Precise Notational System (1968) the study is represented as follows:

Laboratory experiment

| | $t_1$ | $t_2$ | $t_3$ |
|---|---|---|---|
| P1a | $M_1$ | $T_1(fx)$ | $M_{2-5}$ |
| P1b | $M_1$ | $T_2(fx)$ | $M_{2-5}$ |
| P1c | $M_1$ | $T_3(fx)$ | $M_{2-5}$ |
| P1d | $M_1$ | $T_4(fx)$ | $M_{2-5}$ |
| P1e | $M_1$ | T(P) | $M_{2-5}$ |

Legend

P1 = group of 100 students in Introduction to Mass Communications class

P1a, b, c, d, e = random samples of P1--20 each

T1 = set of two newspaper stories, including one of a non-radiation accident, does not include "no harm done" statement

T2 = set of two newspaper stories, including one of a non-radiation accident, includes a "no harm done" statement

T3 = set of two newspaper stories, including one of a radiation accident, does not include a "no harm done" statement

T4 = set of two newspaper stories, including one of a radiation accident, includes a "no harm done" statement

T (P)=set of two non-nuclear stories

t1 = May 19, 1982, 9 a.m.

t2 = May 19, 1982, 9:05 a.m.

t3 = May 19, 1982, 9:10 a.m. to 9:45 a.m.

M1 = social issues assessment whose purpose is to find out whether a person has strong feelings about the issue of nuclear power.

M2 = series of 11 items using the semantic differential to measure understanding and attitude toward the story read

M3 = multiple choice and fill-in-the-blank test to measure knowledge of facts about nuclear power (10 questions)

M4 = multiple choice test to measure knowledge of facts about highway safety (results not to be used)

M5 = demographic information (age, sex, education level, political party affiliation, media habits, source of information on nuclear power)

Narrative Description

Population for the study was 100 students in Communications 1110, Introduction to Mass Communications. Subjects were assigned randomly to one of five groups of 20 each.

On May 19, 1982, the 100 subjects were each assigned a number, then randomly assigned to treatment groups. An oral description of the University of Tennessee guidelines for the use of human subjects in research was made by the researcher to the entire group. (For a copy of the statement and the University's approval of this project, see Appendix A.) All subjects agreed to participate. Each was handed a packet of materials, the first part of which was a "social issues assessment" which included questions about the performance of Ronald Reagan in the White House, the desirability of compulsory military service, and other questions whose purpose it was to "mask" the one question of interest--the attitude of respondents toward the operation of nuclear power plant facilities in the United States. (For a copy of the complete instrument used for the study, see Appendix B.)

Next, subjects were instructed to read two newspaper articles--one on traffic violations, and the other on a nuclear power plant incident--the article of interest. Again, the purpose of including two articles on different topics was to mask at least in part the true purpose of the experiment. Items were presented in portfolio fashion. The choice of treatments for the study followed the 2 X 2 design with a control group. The presence or absence of story material about an incident involving radiation represented two levels of one treatment variable. Levels of the second treatment variable were the presence or absence of a statement indicating that any damage caused by the

accident reported was within federally defined safety standards for the nuclear industry. For the sake of brevity, this safety caveat will be referred to as the "no harm done" statement in the remainder of this paper.

Subjects were instructed to read through the articles only once, just as they would an article in their daily newspaper. A technique used by Johnson (1963) of randomly varying the order of the items within treatments was employed in an attempt to minimize the effects of serial order of response. To guard against internal validity problems involving treatments, the nuclear-related stories were about the same length and had similar levels of reading ease as calculated using the Flesch Readability Formula (Flesch, 1949). Headline size also was constant. All stories were one-column in width.

After reading the stories, subjects were given instructions on how to fill out the semantic differential scales, and then were asked to respond to both stories read on 11 such scales, chosen from Osgood and Johnson (1963). Bipolar adjective pairs were intended to measure the evaluative dimension of meaning for the stories involves, since, according to Osgood, that dimension of judgment accounts for the greatest amount of semantic space. Adjectival pairs included:

Optimistic -- Pessimistic

Positive -- Negative

Complete -- Incomplete

Meaningful -- Meaningless

Important -- Unimportant

Definite -- Uncertain

Pleasant -- Unpleasant

Calming -- Exciting

Nonthreatening -- Threatening

Clear -- Unclear

Good -- Bad

Hypotheses

General hypotheses to be tested in the experiment were:

Power plant accident stories containing information of a radiation leak will be judged more serious (pessimistic, negative, meaningful, important, uncertain, unpleasant, exciting, threatening, bad) and more unclear than those stories which do not involve radiation.

Power plant accident stories containing a "no harm done" statement will be judged less serious (pessimistic, negative, meaningful, important, uncertain, unpleasant, exciting, threatening, bad) and more clear than those stories which do not have such a statement.

Test on Nuclear Power

After rating the stories on the semantic differential scales, subjects were asked to complete short objective-type tests on the topics about which they read. Of interest, of course, were the answers to questions about the nuclear power industry. Subjects were assigned a score of 1-10, with 10 representing a perfect score of all items correct.

The final portion of the questionnaire asked for demographic information--age, sex, year in school, political party affiliation, and then a series of questions designed to ascertain the extent to which subjects use the various media for daily news information and, more specifically, for information about nuclear power.

The Q-sort Procedure

Q-methodology is a term used by its founder, William Stephenson (1953), to describe ideas about researching individuals as opposed to researching responses, which are the subjects of what he calls "R-methodology." Q-methodology is operationalized using Q technique, a rank-order procedure that has subjects sorting decks of cards (Q sorts), which contain stimuli such as verbal statements, pictures, phrases, etc. The subject is directed to place the objects or cards in several piles or groups. Statistical analysis yields correlations among individuals and clusters or factors among persons (Kerlinger 1973).

Kerlinger reports that Q-methodology is a controversial research procedure that has been highly praised and harshly criticized. Cited as its strengths are its (1) affinity to theory, (2) its suitability to intensive study of the individual, (3) its sensitivity to change in attitude, (4) its heuristic quality, and (5) its usefulness in exploratory research. Disadvantages of the Q technique, according to Kerlinger, are (1) its unsuitability to large sample sizes, (2) its lack of generalization to other populations, (3) its violation of the independence assumption of most statistical tests, and (4) its insistence on forced-choice procedure, which is believed by some researchers to be unnatural.

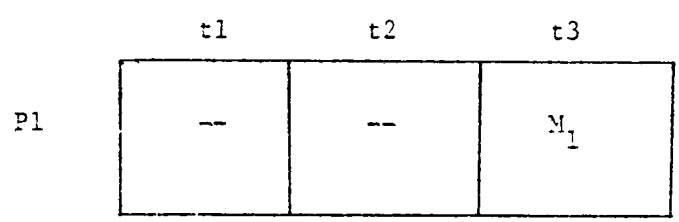
Q technique was chosen because of its advantages of ease of administration, small sample requirements, forced discrimination (choices that subjects normally are not asked to make), and flexibility in terms of exploratory research. It was hoped that detailed information about attitudes toward a complex issue would be rendered as the result of its use.

Stimuli consisted of 60 statements about nuclear power. Kerlinger reports that rarely should less than 50 or more than 140 items be used. He cites an ideal range of between 60 and 90 items. Statements were drawn from books, articles, and other commentary dealing with the issue of nuclear power. The sentences used were positive and negative, and approximated the range of opinion on the subject of nuclear power in the United States.

Sixteen subjects participated in the Q-sort portion of the study. The subjects received the same assurances of anonymity and ability to withdraw from the procedure as the subjects in the newspaper study. All chose to take part.

Participants were seated around seminar tables and were handed a packet of 60 statements about nuclear power typed on 4 X 6 inch sheets of paper. (For a complete list of statements used, see Chapter IV.) They received five additional cards marked Strongly Approve, Somewhat Approve, Neutral, Somewhat Disapprove, and Strongly Disapprove, and were instructed to place these before them with the Strongly Approve card on the far left and the Strongly Disapprove on the far right. Subjects were told to read each card and place each one in a stack according to how they felt about the statement. Cards could be handled more than once, and could be moved from one stack to the next if the subject desired.

Using the Haskins Notational System, the Q-sort is represented:



Legend

P1 = sample of 16 students from Communications 1110 class

t3 = May 19, 1982, 9 a.m.

$M_1$ = attitude toward 60 statements about the nuclear power industry, as measured by Q-sort arrangement

# CHAPTER IV

## RESULTS

Findings of the study will be presented in the following order:

1. response among the five groups in the newspaper study
2. results from the test on nuclear power
3. findings of the Q-sort procedure
4. description of the sample used for the study

### Judgments of Newspaper Articles on Individual Semantic Scales

Analysis of variance was performed to assess differences between the five experimental groups. Test of choice for this study was the Kruskall-Wallis H test for k-independent samples. According to Champion (1981), the Kruskall-Wallis is appropriate for evaluating differences between k-independent samples according to some independent variable measured on an ordinal scale.

Briefly, the procedure involved is ranking of raw scores across groups to assess differences between sets of ranks for the different groups. Sums of ranks are used in a formula to determine an observed H value, which is then interpreted in a chi-square table. In groups where the H-value was found to be significant at the .05 level, the Mann-Whitney U test for two independent samples was used to determine where the differences were found.

Assumptions of the Kruskall-Wallis H test and the Mann-Whitney U test are:

1. randomness
2. the ordinal level of measurement
3. k independent samples.

Champion reports that the Kruskall-Wallis is the most powerful nonparametric equivalent to the parametric F test for analysis of variance.

Visual inspection of median scores of the five groups on the 11 semantic differential scales can be made using Fig. 1. Group labels to be used throughout the remainder of the discussion are presented in Table 1. A verbal description of the results of tests for differences follows. Table 2 presents H-values for the 11 scales as judged by the five groups. Tables 3-6 contain significant U-values of groups found to be significantly when the Mann-Whitney U test was applied.

Results of the Kruskall-Wallis H test

Below is a description of results of the Kruskall-Wallis procedure. The null hypothesis for each item evaluated was that no difference would exist between the five groups on a particular scale. Table 2 shows the results of the Kruskall-Wallis for significance between k-samples. It can be seen that for the items Optimistic/Pessimistic, Complete/ Incomplete, Meaningful/Meaningless, Important/ Unimportant, Definite/ Uncertain, Clean/Unclean, and Good/Bad, groups were not found to be significantly different in their judgments. Therefore, the null hypotheses 1, 3, 4, 5, 6, 10, and 11 could not be rejected.

Table 2 shows that significant differences were found for scales labeled Positive/Negative, Pleasant/Unpleasant, Calming/Exciting, and Nonthreatening/Threatening. Tables 3-6 present U-values from the application of the Mann-Whitney U test to locate where differences occurred. The results are described below in relation to the hypo-

TABLE 1

GROUP LABELS

| Number | | |
|---|---|---|
| 1 | Without Radiation | Without "No Harm Done" |
| 2 | Without Radiation | With "No Harm Done" |
| 3 | With Radiation | Without "No Harm Done" |
| 4 | With Radiation | With "No Harm Done" |
| 5 | Control Group | |

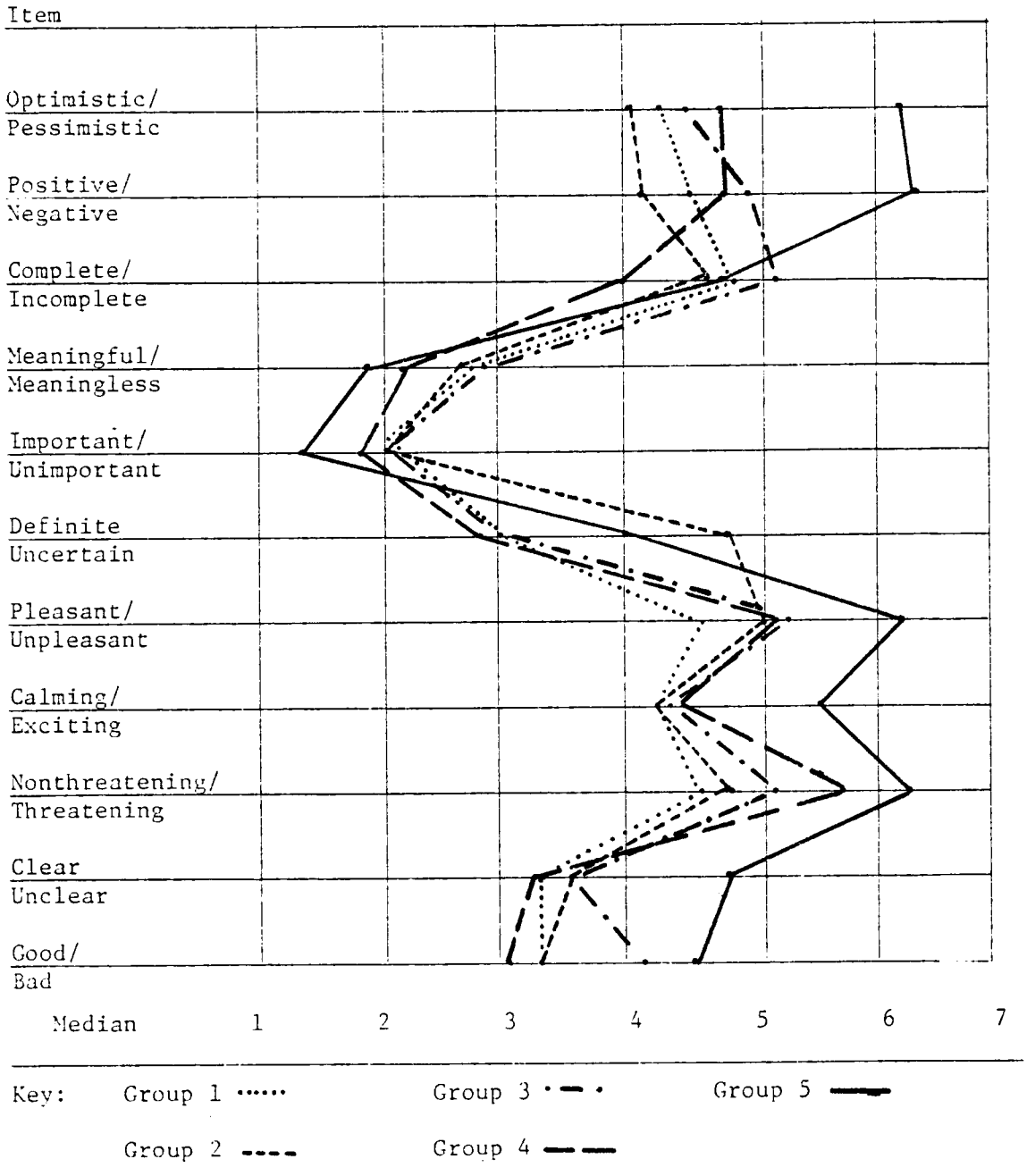



FIGURE 1

MEDIAN SCORES BY GROUP OF SEMANTIC DIFFERENTIAL ITEMS

TABLE 2

KRUSKALL-WALLIS H TEST FOR
DIFFERENCES AMONG GROUPS

| Variables | H-values( 2)* |
|---|---|
| Optimistic/Pessimistic | - 9.98 |
| Positive/Negative | 13.56** |
| Complete/Incomplete | 1.06 |
| Meaningful/Meaningless | 3.15 |
| Important/Unimportant | 2.56 |
| Definite/Uncertain | - 4.37 |
| Calming/Exciting | 10.78** |
| Pleasant/Unpleasant | 12.92** |
| Nonthreatening/Threatening | 15.37** |
| Clear/Unclear | 1.42 |
| Good/Bad | 2.38 |

*H-values are interpreted using a chi-square table

**significant at the .05 level

thesis tested:

Hypothesis 2 ($H_o$) There will be no difference between judgments of the five groups on the Positive/Negative scale.

Table 2 gives a significant H-value of 13.56 for this item. Thus, the null hypothesis is rejected. Application of the Mann-Whitney U test (Table 3) revealed significant differences between Group 5 and all other groups. Group 5, the control group, rated the concept "Newspaper Articles About Nuclear Power Plant Accidents" as significantly more negative than the other groups rated their stories.

Hypothesis 7 ($H_o$) There will be no difference between judgments of the five groups on the Pleasant/Unpleasant scale.

An H-value of 10.78 appears in Table 2 for this variable, indicating significant differences between groups. The null hypothesis is rejected. Using the Mann-Whitney U test to determine where the differences exist, it was found that Group 5, the control group, rated the concept "Newspaper Articles About Nuclear Power Plant Accidents" significantly more unpleasant than Groups 1, 2, and 4 rated their articles (Table 4).

Hypothesis 8 ($H_o$) There will be no difference between judgments of the five groups on the Calming/Exciting scale.

The H-value of 12.92 in Table 2 indicates significant difference exists between groups on this item. Thus, the null hypothesis is rejected. The Mann-Whitney U test (Table 5) found significant differences between Group 5, the control group, and Groups 1, 3, and 4. Group 5 rated its concept more exciting than Groups 1, 3, and 4 rated their respective stories.

TABLE 3

MANN-WHITNEY U TEST FOR DIFFERENCES BETWEEN GROUPS ON POSITIVE/NEGATIVE SCALE

| Group | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| 2 | -- | | | |
| 3 | -- | -- | | |
| 4 | -- | -- | -- | |
| 5 | 60.5* | 63* | 91* | 86.5* |

*significant at the .05 level

TABLE 4

MANN-WHITNEY U TEST FOR DIFFERENCES BETWEEN GROUPS ON PLEASANT/UNPLEASANT SCALE

| Group | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| 2 | -- | | | |
| 3 | -- | -- | | |
| 4 | -- | -- | -- | |
| 5 | 87* | 111* | -- | 115* |

*significant at the .05 level

TABLE 5

MANN-WHITNEY U TEST FOR DIFFERENCES BETWEEN GROUPS ON CALMING/EXCITING SCALE

| Group | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| 2 | -- | | | |
| 3 | -- | -- | | |
| 4 | -- | -- | -- | |
| 5 | 89* | -- | 99.5* | 93* |

*significant at .05 level

TABLE 6

MANN-WHITNEY U TEST FOR DIFFERENCES BETWEEN GROUPS ON NONTHREATENING/THREATENING SCALE

| Group | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| 2 | -- | | | |
| 3 | -- | -- | | |
| 4 | 126* | -- | -- | |
| 5 | 83.5* | 115.5* | -- | -- |

*significant at the .05 level

Hypothesis 9 ($H_o$) There will be no difference between judgments of the five groups on the Nonthreatening/Threatening scale. A significant H-value in Table 2 of 15.37 caused rejection of the null hypothesis. Application of the Mann-Whitney U test (Table 6) revealed significant differences exist between Groups 5 and 1, Groups 5 and 2, and Groups 4 and 1. Group 5 judged the concept "Newspaper Articles About Nuclear Power Plant Accidents" significantly more threatening than Group 1 and Group 2 judged their respective stories. Group 4 judged its article more threatening than did Group 1.

While these were the only significant differences found, it was noted that in several instances the direction of the group responses, while not significant statistically, was consistent with directional hypotheses stated in Chapter III. On the Optimistic/Pessimistic scale, for instance, Group 1 (Without Radiation, Without "No Harm Done") rated its article more pessimistic than did Group 2 (Without Radiation, With "No Harm Done"). This is consistent with the general prediction that stories without "No Harm Done" statements would be judged more pessimistic than those which contained such a statement. On the Meaningful/Meaningless scale, Groups 1 and 3, both without "No Harm Done" statements, rated their articles more meaningless than did Groups 2 and 4, who read stories containing the statement of no harm done. Again on the Definite/Uncertain scale, Group 3 (With Radiation, Without "No Harm Done") rated its article more uncertain than did Croup 4 (With Radiation, With "No Harm Done).

On the Positive/Negative scale, Group 3 (With Radiation, Without "No Harm Done") rated its article more negative than did Group 4 (With Radiation, With "No Harm Done"). Judgments on the Complete/Incomplete, Pleasant/Unpleasant, Calming/Exciting, and Clear/Unclear scales showed Group 3 again rating its article without the "No Harm Done" statement as more incomplete, unpleasant, exciting, and unclear then Group 4, whose article contained the statement. Finally, on the Good/Bad scale, both groups reading stories without "No Harm Done" statements (Groups 1 and 3) rated their articles more "bad" than did Groups 2 and 4, whose articles contained statements of no harm done.

Factor Analysis of Semantic Scales

In order to determine which of the semantic scales clustered together on a single dimension, a factor analysis was performed across all 11 items. An initial correlation matrix was obtained, and then a rotated factor pattern, which yielded three separate factors (see Table 7).

Those items loading on Factor I were: Complete/Incomplete, Definite/Uncertain, Clear/Unclear, Good/Bad. As a group, these scales seem to measure what could be called the "Conclusiveness" of a story--whether a story offers enough information for the reader to determine what it means to him individually.

Factor II includes the items Optimistic/Pessimistic, Positive/Negative, Pleasant/Unpleasant, Calming/Exciting, and Threatening/Nonthreatening. This dimension of judgment could be described as "Negative-Evaluative," and it seems to represent a more emotional

TABLE 7

ROTATED FACTOR PATTERN
FOR 11 SEMANTIC SCALES

| Scale | FACTOR I | FACTOR II | FACTOR III |
|---|---|---|---|
| Optimistic/Pessimistic | 0.08335 | 0.77050 | 0.02123 |
| Positive/Negative | 0.09131 | 0.83347 | 0.13772 |
| Complete/Incomplete | 0.76549 | 0.00636 | 0.20018 |
| Meaningful/Meaningless | 0.40816 | -0.05215 | 0.78390 |
| Important/Unimportant | 0.32986 | -0.00547 | 0.72627 |
| Definite/Uncertain | 0.74144 | -0.02814 | 0.15762 |
| Pleasant/Unpleasant | 0.09954 | 0.61449 | - 0.06676 |
| Calming/Exciting | -0.09416 | 0.43853 | - 0.42700 |
| Nonthreatening/Threatening | -0.16883 | 0.52112 | - 0.30764 |
| Clear/Unclear | 0.80248 | 0.05734 | 0.20521 |
| Good/Bad | 0.67882 | 0.19430 | 0.39283 |

reaction than do the items of Factor I.

Factor III contains only two items: Important/Unimportant, and Meaningless/Meaningful, both of which could be said to describe an index of mental "Priority" for the stories based on whether they were important, unimportant, meaningful, or meaningless. It was noted that the scale Calming/Exciting loaded significantly on Factor III but in a negative direction, which indicates that stories judged important or meaningful are generally judged exciting as well, and conversely, articles considered unimportant or meaningless are likely to be considered calming. See Table 8 for scale groups.

The value of the factor analysis lies in its ability to differentiate even among a group of items intended to measure the evaluative dimension of meaning, a subsequent clustering of scales indicating even finer refinements of the single dimension. In the case of the 11 scales used for this study, three separate dimensions of judgment emerged in the factor pattern, further explaining the elements of a respondent's reaction to the treatment stimulus. The three factor accounted for almost 71 percent of the total variance among the groups (see Table 9).

Differences Between Group Judgments on Semantic Factors

The final step in analyzing response to the 11 semantic items was a comparison of the five experimental groups on the basis of their answers on factors rather than on individual scales (Table 10).

Test of choice was the Kruskall-Wallis H-test, whose assumptions are discussed earlier in Chapter III. The procedure was carried out

TABLE 8

SEMANTIC SCALE FACTORS

| Factor | Scales |
|---|---|
| I. Conclusive | Complete/Incomplete |
| | Definite/Uncertain |
| | Clear/Unclear |
| | Good/Bad |
| II. Negative-Evaluative | Optimistic/Pessimistic |
| | Positive/Negative |
| | Pleasant/Unpleasant |
| | Calming/Exciting |
| | Threatening/Nonthreatening |
| III. Priority | Important/Unimportant |
| | Meaningless/Meaningful |

TABLE 9

VARIANCE EXPLAINED BY THREE FACTORS*

| Factor I | Factor II | Factor III |
|---|---|---|
| 2.580940 | 2.175216 | 1.696929 |

* The computation $\frac{\text{Factor I + Factor II + Factor III}}{\text{number of scales}}$ yields a total of approximately 71 percent of total variance explained.

TABLE 10

MULTIPLE COMPARISON TESTS FOR DIFFERENCES BETWEEN GROUPS ON SEMANTIC FACTORS**

| Group | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| 2 | -- | | | |
| 3 | -- | -- | | |
| 4 | -- | -- | -- | |
| 5 | -4.3764* | -4.1965* | -3.1828* | -3.2864* |

*significant at .05 level

**scores are z-scores, for which ±1.96 is significant at .05 level

on an IBM computer. Chi-squared probabilities were provided to indicate significant differences, and multiple comparison tests reported using z-scores indicated where differences were found.

Results indicated significant differences between groups on Factor II and no significant differences on Factors I and III. Z-scores for Factor II comparisons are shown in Table 10. The multiple comparison tests revealed that significant differences on the Negative-Evaluative Factor II were found between Group 5, the control group, and each of the four treatment groups.

Test on Nuclear Power

Below are the ten questions used to get an indication of respondents' knowledge of nuclear power facts. Each question is listed, followed by the correct answer and a summary of how respondents answered it.

Overall tabulation showed that eighty-one (81) percent of the respondents got six or fewer correct responses, or a score of sixty (60) percent or below.

Question 1: How many nuclear reactors are presently in the state of Tennessee?

1. 1-3
2. 4-7
3. 10-15

The correct answer is 1-3, No. 1. Sixty-one (61) percent of respondents answered correctly on this item.

Question 2: Name the federal body which oversees the nuclear power industry.

The correct answer is the Nuclear Regulatory Commission. Thirty-eight (38) percent of respondents filled in the blank for this item correctly.

Question 3: How much of America's energy supply is produced by nuclear power?

1. 7-10 percent
2. 30-40 percent
3. 70-80 percent

The correct answer is 7-10 percent. Sixty-four (64) percent of respondents answered correctly to this item.

Question 4: Which of the following terms is used to refer to radiation dosage to the human body?

1. rem
2. ion
3. photon

"Rem" is the proper term for such reference. Fifty-three (53) percent of respondents checked the correct answer.

Question 5: There are no breeder reactors in operation in the United States today.

1. True
2. False

This is a false statement, and ninety-one (91) percent of the respondents marked it as such.

Question 6: Approximately how many nuclear power reactors are in the United States today?

1. 40
2. 100
3. 200

The correct answer is 100. That answer was the choice of thirty (30) percent of the respondents.

Question 7: One of the approved methods of storage of U.S. nuclear waste is burial in salt domes.

1. True
2. False

Salt mine storage is not approved, so the answer is false. Fifty-two (52) percent of those responding chose the correct answer.

Question 8: The accident at Three Mile Island in 1979 produced one of the following:

1. a partial core meltdown
2. a total core meltdown
3. no core damage
4. China Syndrome

The correct answer is "partial core meltdown," which was the choice of sixty-seven (67) percent of those responding.

Question 9: There has never been a radiation-related death resulting from work done at a commercial nuclear power plant in the United States.

1. True
2. False

The answer to this question is "True." Fifty-two (52) percent of respondents answered it correctly.

Question 10: Which of the following is NOT a source of daily radiation dose?

1. the sun
2. people we come into contact with
3. buildings we live and work in
4. fallout from nuclear weapons tests
5. flourescent light bulbs in lamps

The correct answer is "flourescent light bulbs in lamps." Thirteen (13) percent of respondents answered this question correctly.

Scores by Group

Individual respondents' scores ranged from as few as two to as many as nine correct items. Average percentage correct by group was fairly similar: Group 1, 57 percent; Group 2, 51 percent; Group 3, 45 percent; Group 4, 59 percent; Group 5, 51 percent.

The Q-Sort

A group of 16 subjects was instructed to sort the statements according to how they felt about nuclear power in the United States. Sorting was done in piles or groups representing a continuum of attitude from "Strongly Agree," "Somewhat Agree," "Neutral," "Somewhat Disagree," and "Strongly Disagree." Statements are listed in Table 11.

Evaluation of the Q-sort was done by way of factor analysis, the first step of which is preparation of a correlation matrix of individuals. Data is further reduced by mathematical transformations which yield initial factors. After extraction of initial factors, a terminal solution of rotated factors is derived which simplifies the factor structure. Varimax rotation was used (Nie, et al. 1970). Table 12 presents the rotated factor results. Table 13 shows the variance explained by each factor. Approximately 58 percent of the total variance was explained by the three rotated factors.

Subjects were assigned to groups on the basis of the factor on which they loaded most highly. One subject was omitted from further anslysis due to his low communality, or shared variance, score, which indicated that his answers were most unlike that of any of the other 15 participants. The remaining subjects then were broken into

TABLE 11

Q-SORT ITEMS

Nuclear power is mostly an emotional issue in this country--most people don't back up their opinions with facts.

Nuclear power plants should be accepted as safe until conclusive proof is found that shows people are endangered by them.

Most people don't feel strongly about nuclear power one way or the other.

The United States should look into all energy sources to determine what can best suit this country's needs.

The media are incapable of covering an issue as complex as that of nuclear power.

The press has over-reacted to reports of accidents at nuclear power plants.

I often worry about the dangers of nuclear power.

The United States could never recover from a melt-down at one of its nuclear power plants.

Public policy on nuclear reactors should be left up to scientists.

The fact that the nuclear power facility at Three Mile Island has not been "cleaned up" is an indication of the confusion that surrounds what took place there.

Private industry should be financially liable to anyone harmed in a nuclear power plant accident.

Without nuclear power the United States would be more dependent on foreign countries for energy resources.

The dangers of nuclear power plant accidents outweigh the benefits of energy we gain from such facilities.

Nuclear power is a man-made hazard that should not be imposed on a society without its consent.

If people knew more about how nuclear power plants operate, they wouldn't be afraid of them.

Nuclear power should be slowed down until questions of safety are resolved.

Nuclear power plants are operating safely just the way they are.

TABLE 11 (continued)

Compared with other industries, nuclear power has been the cause of relatively few deaths and injuries.

The government should control nuclear power plants more closely.

The United States should phase out nuclear power plants now in use.

Radiation is dangerous.

Scientists can't seem to agree on how radiation affects people.

A nuclear power plant is a lot like a time bomb waiting to go off.

Technology in the nuclear power industry is advanced enough to assure safe operation.

The accident at Three Mile Island is an example of the dangers that exist at nuclear power plants.

Nuclear power is dangerous.

It is up to the U.S. government to see that safety standards for nuclear power plants are enacted and adhered to.

Present energy resources won't be sufficient for the country's needs in the next decade.

Terrorist groups could seize nuclear power plants and convert the radioactive materials to weapons.

People who staff nuclear power facilities should be more careful.

It would be worth the added cost to the U.S. energy program if non-nuclear sources of energy were explored more fully.

Nuclear power is basically safe.

Accidents where radiation is leaked outside a nuclear power plant are most unlikely events.

The long-term effects of radiation are more serious than the short-term ones.

The media do not give the public enough information to understand the technical aspects of the nuclear power issue.

In terms of accident and injury, it is safer to work at a nuclear power plant than at most other industrial facilities.

The American public is in as much danger from nuclear power plants as they are from nuclear weapons.

TABLE 11 (continued)

| |
|---|
| Those who oppose nuclear power are a small, vocal minority of America. |
| Storing nuclear waste is a problem that looms on our horizon. |
| The U.S. may control radioactive substances safely, but other countries can not. |
| It would be a mistake for the U.S. to suspend nuclear plant construction. |
| The public doesn't get enough information on nuclear power from media. |
| The spread of nuclear technology in the U.S. and other countries increases opportunities for terrorists to engage in nuclear action. |
| It is impossible to have international safeguards for radioactivity. |
| Government standards for accidental radioactive releases are too low. |
| Nuclear power plants are not designed safely. |
| The most serious threat to nuclear plant operation is human error. |
| It would be impossible to design a nuclear power plant safely. |
| Most accidents at nuclear plants involve low levels of radiation. |
| Nuclear power plants have proven records of safety. |
| Critics have greatly exaggerated the risks of nuclear waste disposal. |
| Most people do not fear danger from nuclear power facilities. |
| Permanent disposal of nuclear waste poses no insurmountable problem. |
| The public is incapable of forming an intelligent opinion on nuclear power. |
| It is not known what harm nuclear power plants have already done. |
| If U.S. citizens voted tomorrow, nuclear power plants would shut down. |
| I would not want my spouse to work at a nuclear power plant. |
| Nuclear power has already proved basically safe. |
| The U.S. should stop all work on nuclear power plants now under construction. |

TABLE 12

ROTATED FACTOR PATTERN

| Person | Factor 1 | Factor 2 | Factor 3 |
|---|---|---|---|
| 1 | 0.13587 | 0.39357 | 0.19470 |
| 2 | 0.69086 | 0.10285 | 0.43532 |
| 3 | 0.23507 | 0.59022 | 0.09475 |
| 4 | 0.43932 | -0.00853 | 0.56198 |
| 5 | -0.25767 | 0.87205 | 0.05831 |
| 6 | 0.72373 | 0.11744 | 0.29615 |
| 7 | 0.27970 | 0.14564 | 0.56324 |
| 8 | 0.66975 | 0.20763 | 0.30759 |
| 9 | -0.01655 | 0.79166 | 0.03159 |
| 10 | 0.17751 | 0.79089 | -0.05344 |
| 11 | 0.28924 | -0.43956 | 0.49926 |
| 12 | 0.58186 | -0.30847 | 0.53214 |
| 13 | 0.79054 | -0.02253 | 0.40552 |
| 14 | 0.28689 | 0.08796 | 0.61689 |
| 15 | 0.22299 | 0.35054 | 0.64296 |
| 16 | 0.56966 | 0.53800 | 0.14495 |

TABLE 13

VARIANCE EXPLAINED BY EACH FACTOR*

| Factor 1 | Factor 2 | Factor 3 |
|---|---|---|
| 3.396515 | 3.313668 | 2.570842 |

*The computation $\frac{\text{Factor 1 + Factor 2 + Factor 3}}{\text{number of subjects}}$ yields a total of approximately 58 percent total variance explained.

three groups or "types" according to their factor loadings, with six persons assigned to Type I, four persons assigned to Type II, and five persons assigned to Type III.

Response patterns for each Type category were analyzed to obtain typical sorts for each group. Scores for each of the 60 items were summed by group and a mean computed. Statements were then ordered in an approve-disapprove array according to the magnitude of mean scores. The purpose of ordering individual statements by Type was to extract a list of those items most strongly approved of and most strongly disapproved of for each Type. Results of composite sorts are presented in Tables 14-16.

The 10 most approved and 10 most disapproved of statements, or "discriminating items," were taken from respective extremes of the arrays in an attempt to highlight the differences in attitude by Type. One exception was made for a highly approved item which was ranked first or second across all groups. Since consensus was found among the three types on the statement: "The United States should look into all energy sources to determine what best suits this country's needs," that item was omitted from the tables in order to allow inclusion of items which highlighted Type differences, rather than similarities.

The statement arrays can be used as a guide in describing the composite attitude for a particular Type. Participants fell into three basis attitude types: those who favored nuclear power, those who exhibited a cautious attitude toward nuclear power, and those who expressed alarm at the existence of nuclear power facilities.

Type II respondents share a basically favorable outlook toward nuclear power and its future. High on their list of concerns are the gloomy prospects of fuel shortages and a resultant dependency by the United States on foreign countries to maintain its supplies. Nuclear power is basically safe, the Type II contends, but not without reservation--this person recognizes the widely held concerns of long-term radiation effects and storage of nuclear waste. These reasons, he contends, do not constitute enough of an argument to discontinue the operation of present nuclear facilities or even to build new ones without hesitation.

The Type I respondent can be described as "cautious" on the subject of nuclear power. He is concerned about the dangers that exist at nuclear power plants, and worries about such safety questions to the point that he would not want to live near a plant. He believes that many others share his concerns, and favors a "slow-down" approach to nuclear power until these unresolved questions are answered.

Type III is definitely opposed to the operation of nuclear power plants in this country. His attitude can be described as "alarmist" in that he expects the worst in all such situations. Concerns of highest priority are terrorist access to radioactive substances, and the potential for a disaster of major proportion. He fears the unknown--there is no way of knowing, he says, what harm has already been done by nuclear power plants. He believes first and foremost that radiation, and hence nuclear power, are dangerous. He feels that many others share his view that adequate safety precautions are not being taken, and that closing nuclear power plants now in operation would not be out of the question.

TABLE 14

LISTS OF DISCRIMINATING ITEMS FROM GROUP STATEMENT ARRAYS--TYPE I

N=6

| Most Approve | | Least Approve | |
|---|---|---|---|
| Score | Statement | Score | Statement |
| 4.83 | Nuclear power should be slowed down until questions of safety are resolved. | 1.33 | Most people do not fear danger from nuclear power plants. |
| 4.83 | I would not want to live within a 100-mile radius of a nuclear plant. | 1.5 | Those who oppose nuclear power are a small but very vocal minority of the American public. |
| 4.83 | Storing nuclear waste is a problem that looms on our horizon. | 1.5 | Most people don't feel strongly about nuclear power. |
| 4.83 | Radiation is dangerous. | 1.5 | Nuclear power plants are operating safely just the way they are. |
| 4.67 | I often worry about nuclear power. | 1.67 | Nuclear power plants should be accepted as safe until conclusive proof is sound that shows people are endangered by them. |
| 4.67 | I would not want my spouse to work at a nuclear plant. | | |
| 4.67 | The accident at Three Mile Island is an example of the dangers that exist at nuclear power plants. | 1.67 | Critics have greatly exaggerated the risks of nuclear waste disposal. |
| 4.67 | It would be worth the added cost to the U.S. energy program if non-nuclear sources of energy were explored more fully. | 1.67 | Public policy on nuclear reactors should be left up to scientists. |
| 4.5 | It is up to the U.S. government to see that safety standards for nuclear power plants are enacted and adhered to. | 1.67 | Permanent disposal of nuclear waste poses no insurmountable problem. |
| 4.5 | The long-term effects of radiation are more serious than the short-term ones. | 1.67 | Accidents where radiation is leaked outside a nuclear power plant are most unlikely events. |
| | | 1.83 | The media are incapable of covering an issue as complex as that of nuclear power. |
| | | 1.83 | The press has over-reacted to reports of nuclear power plant accidents. |

TABLE 15

LISTS OF DISCRIMINATING ITEMS FROM GROUP STATEMENT ARRAYS--TYPE II

N=4

| Most Approve | | Least Approve | |
|---|---|---|---|
| Score | Statement | Score | Statement |
| 4.5 | Without nuclear power the U.S. would be more dependent on foreign countries for energy resources. | 1.0 | It would be impossible to design a nuclear power plant safely. |
| 4.5 | Storing nuclear waste is a problem that looms on our horizon. | 1.25 | The U.S. should stop all work on nuclear power plants now under construction. |
| 4.5 | Present energy resources won't be sufficient for the country's needs in the next decade. | 1.5 | The U.S. could never recover from a melt-down at one of its nuclear power plants. |
| 4.5 | It would be worth the added cost to the U.S. energy program if non-nuclear sources of energy were explored more fully. | 1.5 | The dangers of nuclear power plant accidents outweigh the benefits of energy we gain from such facilities. |
| 4.25 | If people knew more about nuclear power plant operation they wouldn't be afraid of them. | 1.5 | A nuclear power plant is a lot like a time bomb waiting to go off. |
| 4.25 | The most serious threat to the safe operation of a nuclear power facility is human error. | 1.5 | Nuclear power is dangerous. |
| 4.25 | Compared with other industries nuclear power has been the cause of relatively few deaths and injuries. | 1.5 | Terrorist groups could seize nuclear power plants and convert the radioactive materials to weapons. |
| 4.25 | It is up to the U.S. government to see that safety standards for nuclear power plants are enacted and adhered to. | 1.75 | I often worry about the dangers of nuclear power. |
| 4.25 | Nuclear power is basically safe. | 1.75 | Public policy on nuclear reactors should be left up to scientists. |
| 4.25 | The long-term effects of radiation are more serious than the short-term ones. | | |

TABLE 16

LISTS OF DISCRIMINATING ITEMS FROM GROUP STATEMENT ARRAYS--TYPE III

N=5

| Most Approve | | Least Approve | |
|---|---|---|---|
| Score | Statement | Score | Statement |
| 4.8 | Radiation is dangerous. | 1.4 | Permanent disposal of nuclear waste poses no insurmountable problem. |
| 4.6 | The spread of nuclear technology in the U.S. and other countries increases opportunities for terrorists to engage in nuclear action. | 1.8 | Those who oppose nuclear power are a small but very vocal minority of the American public. |
| 4.6 | Storing nuclear waste is a problem that looms on our horizon. | 1.8 | Most people don't feel strongly about nuclear power one way or the other. |
| 4.6 | It would be worth the added cost to the U.S. energy program if non-nuclear sources of energy were explored more fully. | 1.8 | Technology in the nuclear power industry is advanced enough to assure safe operation. |
| 4.4 | The public does not know enough about nuclear power to form an intelligent opinion. | 1.8 | Nuclear power is basically safe. |
| 4.4 | There is no way of knowing what harm has already been done by nuclear power plants. | 2.0 | The media are incapable of covering an issue as complex as that of nuclear power. |
| 4.4 | I would not want my spouse to work at a nuclear plant. | 2.0 | The press has over-reacted to reports of accidents at nuclear power plants. |
| 4.4 | The government should control nuclear power plants more closely. | 2.0 | It would be a mistake for the U.S. to suspend construction of nuclear power plant facilities. |
| 4.4 | A nuclear power plant is like a time bomb waiting to go off. | 2.0 | Nuclear power has already proved basically safe. |
| 4.4 | It is up to the U.S. government to see that safety standards for nuclear power plants are enacted and adhered to. | 2.0 | Accidents where radiation is leaked outside nuclear power plants are most unlikely events. |

One advantage of the Q-sort is its ability to provide a more detailed description of attitude types than do conventional survey questionnaire items. It was hoped that since the Q-sort sample was drawn from the population used for the newspaper article experiment, the attitude analysis would help explain results of the experiment. A discussion of the relationship between the Q-sort results and those of the experiment is found in Chapter V.

## Description of the Population

The following pages will contain a summary of population parameters on several different variables, including: age, sex, political party affiliation, media habits, source of information on nuclear power, and attitude toward nuclear power. It is hoped that this information will be useful in reaching conclusions about the results of the study.

The information presented is for the 100 respondents in the newspaper article experiment only. Questions will be presented as they were on the original questionnaire, and the percentage of respondents who chose a given answer will appear next to that choice (see next pages).

## Summary of Population Parameters

Respondents were largely first- and second-year college students under 20 years old. Eighty-two (82) percent were from 17-20 years old; 15 percent were from 21-24 years old; and 3 percent were from 25 to 30 years old. Males constituted 54 percent of the sample, and females 46 percent.

Forty-six (46) percent of respondents were college freshmen, 34 percent were sophomores, 15 percent juniors, and 5 percent seniors.

Political party affiliation ranged from 35 percent Democrats, 36 percent Republicans, 26 percent Independents, and 3 percent "Other."

Respondents were asked to answer a series of questions about their media habits, beginning with how often they read a daily newspaper other than the student newspaper. Twenty-eight (28) percent said they read a daily newspaper every day, while 21 percent said they read one at least four days per week. Those who read a daily newspaper at least one day per week totaled 36 percent, while 15 percent reported they rarely or never read one.

Local television was reportedly watched every day by 30 percent of respondents, with 37 percent saying they watched at least four days per week. Twenty-four (24) percent said they watched local news programs on television at least once a week, and 9 percent said they rarely or never did so.

Fewer respondents reported that they watched national news daily--19 percent. Those who said they watched at least four days per week totaled 38 percent, and 26 percent said they watched at least one day per week. Seventeen (17) percent said they rarely or never watched national news on television.

News on the radio was listened to every day by 59 percent of those responding; 21 percent said they listened to radio news at least four days per week; 12 percent said they listened at least one day per week; and 8 percent said they rarely or never did so.

News magazines were reportedly read once a week by 26 percent of respondents; 22 percent said they read news magazines about once every two weeks; 19 percent said they read news magazines about once a month; 16 percent did so less than once a month; and 17 percent said they rarely or never read news magazines.

Most of the respondents, 84 percent, said they got most of their information on nuclear power from the mass media. Seven percent said they relied on books and specialized publications for such information, and 8 percent said their major source of information about nuclear power was from discussion with friends. One person (one percent) chose the "Other" answer, writing that she had not had time to research nuclear power in depth.

A majority of respondents seemed to favor the operation of nuclear power facilities in the United States. Twenty-three (23) percent said they strongly favored operation of nuclear power facilities; 45 percent said they somewhat favored their operation; 16 percent said they somewhat opposed operation of nuclear facilities; 15 percent said they strongly opposed their operation; and one person (one percent) said he had no opinion.

1. Age:

   17-20 82% 21-24 15% 25-30 3% over 30 0%

2. Sex: Male 54% Female 46%

3. Year in school:

   Freshman 46% Sophomore 34% Junior 15% Senior 5% Grad 0%

4. Political Party Affiliation:

   Democrat 35% Republican 36% Independent 26% Other 3%

5. On the average, how often do you read a daily newspaper, OTHER THAN the student newspaper?

   1. every day 28%
   2. at least 4 days per week 21%
   3. at least one day per week 36%
   4. rarely or never 15%

6. On the average, how often do you watch news programs on TV?

   a. Local News?

      1. every day 30%
      2. at least 4 days per week 37%
      3. at least one day per week 24%
      4. rarely or never 9%

   b. National News?

      1. every day 19%
      2. at least 4 days per week 38%
      3. at least one day per week 26%
      4. rarely or never 17%

7. On the average, how often do you listen to NEWS on the radio?

| | |
|---|---|
| 1. every day | 59% |
| 2. at least 4 days per week | 21% |
| 3. at least one day per week | 12% |
| 4. rarely or never | 8% |

8. On the average, about how often do you read news magazines (such as Time, Newsweek, U.S. News)?

| | |
|---|---|
| 1. about once a week | 26% |
| 2. about once every two weeks | 22% |
| 3. about once a month | 19% |
| 4. less than once a month | 16% |
| 5. rarely or never | 17% |

9. What would you say is the major source of most of your information on nuclear power?

| | |
|---|---|
| 1. mass media (newspaper, TV, radio, magazines) | 84% |
| 2. books and specialized publications (such as journals, science magazines, etc.) | 7% |
| 3. friends, through discussion | 8% |
| 4. other -- please specify_____ | 1% |

Do you favor or oppose the operation of nuclear power facilities in the United States?

| | |
|---|---|
| 1. strongly favor | 23% |
| 2. somewhat favor | 45% |
| 3. somewhat oppose | 16% |
| 4. strongly oppose | 15% |
| 5. no opinion | 1% |

# CHAPTER V

## DISCUSSION, CONCLUSIONS, SUGGESTIONS FOR RESEARCH

This section will include a brief summary, then discussion, of the findings. Conclusions will be presented along with suggestions for further research.

### Summary of Findings

One hundred subjects divided randomly into four treatment and one control group participated in the experiment in which the treatment groups judged newspaper articles about nuclear power plant accidents and the control group judged the concept "Newspaper Articles About Nuclear Power Plant Accidents," on 11 semantic differential scales. Participants also completed a 10-item test about nuclear power. Results of the experiment (Chapter IV) revealed that the Threatening/Nonthreatening scale drew significantly different responses from Group 1 (Without Radiation, Without "No Harm Done") and Group 4 (With Radiation, With "No Harm Done") on their respective news articles. This result supported the general hypothesis that articles which report a nuclear power plant accident where radiation was leaked would be judged more threatening than those which do not involve leakage. Responses to eight other scales, while not statistically significant, were directionally consistent with the hypotheses. An unexpected finding was the significant differences found between the control group and most other groups on four scales (Positive/Negative, Pleasant/Unpleasant, Calming/Exciting, and Nonthreatening/Threatening). The control group rated the concept of nuclear accident articles sig-

nificantly more negative, unpleasant, exciting, and threatening than the other groups rated their stories.

Factor analysis of the semantic items yielded three clusters of items further refining dimensions of judgment by respondents. Factors were labeled "Conclusive" (Complete/Incomplete, Definite/Uncertain, Clear/Unclear, Good/Bad); "Negative-Evaluative" (Optimistic/Pessimistic, Positive/Negative, Pleasant/Unpleasant, Calming/Exciting, and Nonthreatening/Threatening); and "Priority" (Important/Unimportant, Meaningless/Meaningful). Only on Factor II, Negative-Evaluative, were groups found to differ significantly, and again, it was the control group which was found to differ from the treatment groups.

Results of a 10-item test on knowledge of nuclear power taken by the experimental groups showed 81 percent of those responding scored six or fewer correct responses, or a score of 60 percent or below.

Sixteen participants in a Q-sort procedure involving attitude toward 60 statements about nuclear power were grouped using factor analysis into three Types: six in Type I--Cautious, four in Type II--Alarmist; and five in Type III--Favoring.

## Discussion, Conclusions, Suggestions for Research

General hypotheses were supported on one of the semantic differential items, and although several other items were consistent in direction with the general hypotheses, their differences were not significant statistically. Four of the items showed the control group differing significantly from other groups.

One possible explanation for the lack of significant findings between Group 3 (With Radiation, Without "No Harm Done") and Group 4 (With Radiation, With "No Harm Done"), who were expected to differ because of the "No Harm Done" statement, involves what could be termed the "intervening" variable of prior attitude about nuclear power. Upon close examination of the make-up of all five groups with respect to their answer to the "social issues assessment" question about attitude toward nuclear power (see Table 17), it was found that the attitudinal composition of Group 4 was decidedly more negative (55 percent opposed) or anti-, nuclear power, than were the other four groups, who averaged only about 25 percent of their members against nuclear power. Of the 55 percent opposed in Group 4, 35 percent, or seven out of 20 respondents, reported that they were "strongly opposed" to the operation of nuclear power plants.

The Q-sort analysis might help explain the implications of such attitude in a similar population. One of the attitudinal components of the strongly anti-nuclear (alarmist) group was strong disapproval of the statement: "Accidents where radiation is leaked outside a nuclear power plant are most unlikely events." Assuming that this strongly held belief came to bear on respondents' judgments of a story about a nuclear power plant accident involving radiation, even the presence of a "No Harm Done" statement might not be sufficient to offset an extreme negative response to attitude toward the story itself.

The fact that the five groups judged many of the stories so similarly on the various scales is seemingly indicative of either a failure to discriminate between an accident story which is factually "complete" and one that is not, or simply a generalized response to a newspaper

TABLE 17

ATTITUDE TOWARD NUCLEAR POWER
PRIOR TO EXPERIMENT*

| Attitude | Group 1 | Group 2 | Group 3 | Group 4 | Group 5 |
|---|---|---|---|---|---|
| Favor | 80% | 80% | 60% | 45% | 75% |
| Oppose | 20% | 15% | 40% | 55% | 25% |
| No Opinion | -- | 5% | -- | -- | -- |

*Subjects were asked the question: Do you favor or oppose the operation of nuclear power facilities in the United States? Possible answers ranged from Strongly Favor, Somewhat Favor, No Opinion, Somewhat Oppose, Strongly Oppose.

account of a nuclear power plant accident, regardless of its content. Either of these response patterns has implications in terms of the journalistic enterprise of reporting such incidents. Though recognition of the time-honored news value known as "consequence" would certainly affect a journalism students' grade or separate the career obit clerk from the investigative reporter, at least for the purposes of this study in the majority of instances it did not seem to matter whether the consequences of a nuclear power plant accident were included.

The components which journalistically differentiate stories may not be recognized by groups of readers, or the generalized response might be so automatic that presence or absence of such factual components might be largely ineffectual. It would be possible in future studies to enhance the impact of the treatment variables by exaggeration or magnification of story differences. This could increase differences and possibly maximize results, and thus become more "testable" than the more subtle story content.

Another potentially biasing factor for the newspaper article experiment is the nature of the population. The young, student population is but one of many possible samples. It would be interesting to carry out the same experiment with other groups, such as a more mature group of newspaper readers, and compare results.

Why did the control group, whose members did not read an actual newspaper article, consistently rate the concept "Newspaper Articles About Nuclear Power Plant Accidents" more negative, threatening, unpleasant, and exciting than did their cohorts who read the actual accounts? It would seem that a "No news is bad news" explanation could be proffered here since those subjects who were given no story to read

offered more negative responses than those who were. Is it possible that the stories themselves have some kind of mitigating effect on subjects' attitude? For example, a person who was asked to create in his own mind the image of a newspaper article about a nuclear power plant accident, and who immediately thought of a Three-Mile-Island-type disaster, might be relieved somewhat to read of a relatively minor accident such as the stories used in this experiment. Though the control group rated a concept and not a story, their images of such stories differed significantly in a negative way even from those whose article reported a radiation leak and an inadequate explanation of the consequences.

With Ball-Rokeach and DeFleur's dependency theory as a backdrop, it is interesting to consider the rationale and the results of this project. The isolation of nuclear accident story component variables of mention of radiation and inclusion of a "No Harm Done" statement has begun what is hopefully a logical method of classifying and evaluating such stories. The priority of individual concerns on the subject of nuclear power as described by the Q-sort procedure lends a valuable dimension to an otherwise empty dichotomy which characterizes so much of survey and experimental research. It is clear from the results of the experiment questionnaire that the vast majority of participants relied on the news media as their major source of information about nuclear power. It is also true that many stories about nuclear power plant accidents in newspapers today are factually incomplete in terms of information about consequences of an incident. The sole reliance on the media for information on a topic fulfills the initial dependency description of DeFleur and Ball-Rokeach. The fact that incomplete,

or conflicting, or unusable information, often is what the media have to offer on the subject of nuclear power accidents, sets the stage for the condition labeled by the authors as "ambiguity." This study was a first step in getting at the potential causes of nuclear reporting ambiguity, and though the results from one audience/ population are not conclusive, it will be instructive to assess story impact on other groups, and to explore potential instruments by which to measure "ambiguity" with regard to media-induced confusion. It is possible that instruments used with experiments of this type are not sensitive enough to measure the subtleties of response to "real world," and not exaggerated, examples of story types. Construction of highly specialized scales could be of help in future studies.

It would also be useful to examine audience reaction to other types of highly technical, highly emotional, media content, the literature about which, like that of nuclear power, is filled with testimony from industry professionals of its shortcomings and potential ill effect. Cancer research as reported in the daily press is an example of such an area pointed to by medical personnel and media researchers as a steady source of conflicting information. A study similar to the one presented here could be conducted to assess reader reaction to actual newspaper or broadcast content and to see if industry allegations are true. If the results are similar to the study described herein, it would seem that the basis for industry criticism (such as the reports by the President's Commission on the Accident at Three Mile Island, and others) and the journalistic values widely accepted on a presumed notion of cause-and-effect, might remain largely unconfirmed.

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# APPENDICES

# APPENDIX A

# APPLICATION FOR REVIEW OF RESEARCH INVOLVING HUMAN SUBJECTS; APPROVAL FROM COMMITTEE ON RESEARCH PARTICIPATION

THE UNIVERSITY OF TENNESSEE, KNOXVILLE

Application for Review of Research Involving Human Subjects

I. Identification of Project:

Date: May 10, 1982
Project Director: Alice Gagnard
Title of Project: The Effects of Different Accounts of Nuclear Power Plant Incidents on Reader Understanding and Attitude
Estimating starting date: upon CRP approval
Estimated completion date: June 1982

II. Objectives of Project: 1) to identify attitudes of readers toward different newspaper accounts of nuclear power plant incidents. 2) to identify types of responses to statements about nuclear power.

III. Description of Subjects: 100 subjects at the University of Tennessee will be used for the attitude assessment. An additional 20 students will be used for the response assessment. Risks involved in the project proposed qualify under the CRP's definition of "minimal risk."

IV. Methods or Procedure: 100 students/subjects will be asked to read different accounts of nuclear power plant incidents and will then be asked to give their attitudes toward the stories by way of semantic differential scales. Subjects will also be asked to read articles on other topics for comparison of attitude. A multiple choice test on all topics read will follow the attitude assessment.
In a separate procedure, 20 subjects/students will be asked to participate in a Q-sort project which involves ranking 60 statements about nuclear power on an approve-disapprove continuum.

V. Specific Risks and Protection Measures:
Risks involved in the proposed project fit the definition of "minimal risk." At no point in the procedures will subjects be asked for their names. The project director will inform subjects that they are assured of anonymity.

VI. Method of Obtaining "informed consent" from subjects:
The informed consent agreement for the proposed project will be oral. Subjects will be informed by the project director that the study involves research, and a description of the procedures to be followed will be supplied, including purposes of the study and duration of the subjects' participation. (see page 3)

Subjects will be informed of their anonymity for the purposes of the proposed project. An explanation of whom to contact for answers to questions about the research and research subjects' rights, and whom to contact in the event of a research-related problem, will be offered. A statement will be made, orally, that participation is voluntary, and that refusal to participate will involve no penalty or loss of benefits. Subjects will be told that they may discontinue participation at any time without penalty of any kind.

VII. Qualifications of the Investigator:
The investigator is a doctoral student in the College of Communications. No special qualifications for the investigator or auxiliary personnel are specified in the project proposal.

VIII. Adequacy of Facilities to Support Research:
not applicable

IX. Responsibility of Project Director:
By the compliance with the policies established by the University Committee on Research Participation, the Project Director subscribes to the broad principles stated in "The Declaration of Helsinki" and standards of professional ethics in all research, development and related activities involving human subjects under the auspices of the University of Tennessee, Knoxville,

a. When appropriate, Form DHHS 569 will be completed and returned to the Office of the Vice Chancellor for Graduate Studies and Research, 404 Andy Holt Tower.
b. Approval will be obtained from the University Committee prior to instituting any change in project protocol.
c. Development of any unexpected risks will be reported to the University Committee.
d. Signed consent statements will be kept for the duration of the project and for at least three years thereafter.
e. A status report (Form D) will be submitted at 12 month intervals, or as requested, attesting to the current status of the project.

Project Director Alice Gagnard

Date May 10, 1982

X. Departmental Review
COMMENTS, RECOMMENDATIONS:

The application described above has been subjected to departmental review and has been approved.

Department Head Herbert H. Howard Date May 10, 1982

Chair, Departmental Committee M. Singletary Date May 10 '82

The following is the text of an oral explanation of participant consent. It will be delivered by the project director prior to initiation of the research procedures.

My name is Alice Gagnard. I'm a doctoral student in the College of Communications. Today I would like to extend to you an opportunity to participate in a research project I am working on involving reader's attitudes toward certain newspaper articles. You'll also be asked to answer some questions about the topics you read about. Hopefully, the results of this research can be used by reporters and editors who cover the topics included in this study.

Let me assure you that I do not know your names; you will not be asked to supply your name on the questionnaire, and at no point will you be identified as an individual in the results I report later. If you would like to get in touch with me about the results of the research we'll carry out today, you can leave me a note or call me at the School of Journalism. My name and phone number are written on the board for you to copy if you'd like.

I'd like to remind you that your participation today is strictly voluntary. In no way will you be penalized if you choose not to participate. Also, if at any time <u>during</u> the session today you decide you would like to withdraw from participation, you are welcome to do so.

THE UNIVERSITY OF TENNESSEE, KNOXVILLE
KNOXVILLE 37996-0140

OFFICE OF THE VICE CHANCELLOR FOR
GRADUATE STUDIES AND RESEARCH

404 ANDY HOLT TOWER

AREA 615
TELEPHONE XXXXXX
974-8159



May 14, 1982

Alice Gagnard
Communications
98 Communications and
University Extension Bldg.
CAMPUS

Dear Ms. Gagnard:

The Committee on Research Participation has reviewed your project entitled "The Effects of Different Accounts of Nuclear Power Plant Incidents on Reader Understanding and Attitude," CRP #1387. The Committee has approved the project as submitted.

Responsibilities of the investigator during the conduct of this project include the following:

1. Obtain prior approval from the Committee before instituting any changes in the project;

2. Retain signed consent forms from subjects for at least three years following completion of the project:

3. Submit a Form D to report termination, to renew approval, or to report changes in the project at 12-month or less intervals.

The Committee wishes you every success in your research endeavor.

Sincerely yours,

L. B. Cebik, Chair
Committee on Research Participation

cc: Dr. L. Evans Roth, Vice Chancellor
for Graduate Studies and Research
Herbert H. Howard
Michael W. Singletary

# APPENDIX B

# THE QUESTIONNAIRE

In the first part of our survey, we'd like to find out how you feel about various social issues in America today. For the following questions, please mark the answer that best describes your feelings toward the issue described. Please do not mark the "No Opinion" answer unless you have absolutely no opinion on the issue.

1. How do you feel about the way Ronald Reagan is doing his job as President?

   1. strongly approve ___
   2. somewhat approve ___
   3. somewhat disapprove ___
   4. strongly disapprove ___
   5. no opinion ___

(5)

2. How do you feel about the statement: "The year 1983 will be a year of rising unemployment"?

   1. strongly agree ___
   2. somewhat agree ___
   3. somewhat disagree ___
   4. strongly disagree ___
   5. no opinion ___

(6)

3. Would you approve or disapprove of a program in which all young people were required to give one year of military service to the United States?

   1. strongly approve ___
   2. somewhat approve ___
   3. somewhat disapprove ___
   4. strongly disapprove ___
   5. no opinion ___

(7)

4. How do you feel about the statement: "The government is placing too much emphasis on the benefits of the nation as a whole at the cost of individuals"?

   1. strongly agree ___
   2. somewhat agree ___
   3. somewhat disagree ___
   4. strongly disagree ___
   5. no opinion ___

(8)

5. How do you feel about the statement: "When a person has a disease that cannot be cured, doctors should be allowed by law to end the patient's life by some painless means if the patient and his family request it"?

   1. strongly agree ___
   2. somewhat agree ___
   3. somewhat disagree ___
   4. strongly disagree ___
   5. no opinion ___

(9)

6. Do you favor or oppose the operation of nuclear power facilities in the United States?

   1. strongly favor ___
   2. somewhat favor ___
   3. somewhat oppose ___
   4. strongly oppose ___
   5. no opinion ___

(10)

7. Do you favor or oppose keeping the 55-mile-per-hour speed limit on the nation's highways?

   1. strongly favor ___
   2. somewhat favor ___
   3. somewhat oppose ___
   4. strongly oppose ___
   5. no opinion ___

(11)

Next, we would like you to read two newspaper articles. These articles should be read in the order in which they appear in your packet of materials. Please read them through just as you would read an article in a daily newspaper. After you finish reading BOTH articles, turn to the questions for each article and answer them. Please DO NOT go back to the original articles to answer the questions. We want your impressions of the articles after having read them only once.

For the purposes of reading these articles, please assume that you are a resident of a city named Reedville in Cherokee County. The articles you will read have been clipped from the Reedville Daily News.

Just as a reminder--remember to read BOTH articles before going on to the directions for answering the questions and the questions themselves. Please do not go back to the articles when you answer the questions. Since the questions are not on FACTS that you remember, there is really no reason to re-read the articles.

When you have finished answering the questions about the stories, please go on to the next part of the questionnaire.

The purpose of the next procedure is to measure the MEANINGS that the newspaper articles have to the various people who read them. The articles will be judged on a series of descriptive scales. In taking this test, please make your judgments on the basis of what these articles mean to YOU. On the next two pages you will find the headline of the stories that you were asked to read and beneath these headlines a set of scales. You are to rate the articles on each of these scales in order.

Here is how you are to use the scales:

If you feel that the article referred to at the top of the page is very closely related to one end of the scale, you should place your check-mark as follows:

fair___:___:___:___:___:___:___unfair

fair___:___:___:___:___:___:___unfair

If you feel that the article is quite closely related to one or the other end of the scale (but not extremely), you should place your check-mark as follows:

strong___:___:___:___:___:___:___weak

strong___:___:___:___:___:___:___weak

If the article seems only slightly related to one side as opposed to the other side (but is not really neutral), you should check as follows:

active___:___:___:___:___:___:___passive

active___:___:___:___:___:___:___passive

The direction toward which you check, of course, depends upon which of the two ends of the scale seem most characteristic of the article you're judging.

If you consider the concept to be NEUTRAL on the scale, both sides of the scale EQUALLY ASSOCIATED with the article being judged, or if the scale is COMPLETELY IRRELEVANT, unrelated to the concept, then you should place your check-mark in the middle space.

safe___:___:___:___:___:___:___unsafe

IMPORTANT: Place your check-marks in the MIDDLE of spaces, not on the boundaries:

___:___:___:___: , NOT ___:___:___:___:___:

Scales for the story:

Please check the space that you feel most nearly describes your feelings about the meaning of the story as a whole.

In my judgment, the story was:

optimistic____:____:____:____:____:____:____pessimistic (12)

positive____:____:____:____:____:____:____negative (13)

complete____:____:____:____:____:____:____incomplete (14)

meaningful____:____:____:____:____:____:____meaningless (15)

important____:____:____:____:____:____:____unimportant (16)

definite____:____:____:____:____:____:____uncertain (17)

pleasant____:____:____:____:____:____:____unpleasant (18)

calming____:____:____:____:____:____:____exciting (19)

nonthreatening____:____:____:____:____:____:____threatening (20)

clear____:____:____:____:____:____:____unclear (21)

good____:____:____:____:____:____:____bad (22)

(23)

Scales for the story:

Please check the space that you feel most nearly describes your feelings about the meaning of the story as a whole.

In my judgment, the story was:

optimistic____:____:____:____:____:____:____pessimistic (12)

positive____:____:____:____:____:____:____negative (13)

complete____:____:____:____:____:____:____incomplete (14)

meaningful____:____:____:____:____:____:____meaningless (15)

important____:____:____:____:____:____:____unimportant (16)

definite____:____:____:____:____:____:____uncertain (17)

pleasant____:____:____:____:____:____:____unpleasant (18)

calming____:____:____:____:____:____:____exciting (19)

nonthreatening____:____:____:____:____:____:____threatening (20)

clear____:____:____:____:____:____:____unclear (21)

good____:____:____:____:____:____:____bad (22)

(23)

In the next part of our survey, we'd like you to fill out a short test on the two topics you read about in your stories. This is not like a test you had time to study for. We're interested in finding out what people know already or might need to know about certain of these issues. Please fill out the two short tests as best you can. When you're finished, go on to the final part of the questionnaire.

Questionnaire on Nuclear Power, page 1

1. How many nuclear power reactors are in operation in Tennessee?

   1. 1-3 ____
   2. 7-10 ____
   3. 50-60 ____

(36)

2. Name the federal body which oversees the nuclear power industry.

   _____

(37)

3. How much of America's energy supply is produced by nuclear power?

   1. 7-10 percent ____
   2. 30-40 percent ____
   3. 70-80 percent ____

(38)

4. Which of the following terms is used to refer to radiation dosage to the human body?

   1. rem ____
   2. ion ____
   3. photon ____

(39)

5. There are no breeder reactors in operation in the United States today.

   1. True ____
   2. False ____

(40)

6. Approximately how many nuclear power reactors are in the United States today?

   1. 40 ____
   2. 100 ____
   3. 200 ____

(41)

7. One of the approved methods os storage of U.S. nuclear waste is burial in salt mines.

   1. True ____
   2. False ____ (42)

8. The accident at Three Mile Island in 1979 produced one of the following:

   1. a partial core meltdown ____
   2. a total core meltdown ____
   3. no core damage ____ (43)
   4. China Syndrome ____

9. There has never been a radiation-related death resulting from work done at a commercial nuclear power plant in the United States.

   1. True ____
   2. False ____ (44)

10. Which of the following is NOT a source of daily radiation dose?

   1. the sun ____
   2. people we come into contact with ____
   3. buildings we live and work in ____
   4. fallout from nuclear weapons tests ____ (45)
   5. flourescent light bulbs in lamps ____

(46)

1. More than one-third of all motor-vehicle accident victims in 1981 were between the ages of:

   1. 5-14 ____
   2. 15-25 ____
   3. 26-44 ____ (47)
   4. 45-64 ____

2. The number of total vehicle deaths between 1980 and 1981 in this country

   1. increased by 10 percent ____
   2. decreased by 4 percent ____
   3. decreased by 10 percent ____ (48)
   4. remained the same ____

3. The total number of motor-vehicle deaths in 1981 was approximately

   1. 20,000 ____
   2. 50,000 ____
   3. 75,000 ____ (49)
   4. 100,000 ____

4. Factors contributing to increases in motor-vehicle fatalities in the United States last year DID NOT include

   1. a declining economy ____
   2. increased vehicle travel ____ (50)
   3. more vehicles and drivers ____
   4. more lightweight cars ____

5. Motor-vehicle accidents are the leading cause of death for children over the age of 1 year.

   1. True ____
   2. False ____ (51)

6. A motor vehicle traveling at 50 miles-per-hour covers how much distance each second?

   1. 25 feet ____
   2. 50 feet ____
   3. 75 feet ____ (52)

7. The National Highway Traffic Safety Administration estimates that drunken drivers cause what number of deaths per year?

   1. 10,000 per year ____
   2. 25,000 per year ____
   3. 50,000 per year ____ (53)

8. Factors contributing to a DECREASE in the number of traffic fatalities in this country DO NOT include:

   1. increased vehicle travel ____
   2. vehicle safety features ____
   3. driver education ____
   4. safety belts and shoulder harnesses ____ (54)

(55)

In the last part of our survey, we'd like you to give us some information about yourself and how you use the media so that we can find out how different people respond to the questions we've asked. Please check the appropriate box or supply the information requested.

1. Age: 17-20____ 21-24____ 25-30____ over 30____ ____ (56)

2. Sex: Male ____ Female ____ ____ (57)

3. Year in school: Freshman___ Soph.___ Junior___ Senior___ Grad___ ____ (58)

4. Political Party Affiliation:

   Democrat ____ Republican ____ Independent ____ Other ____ ____ (59)

5. On the average, how often do you read a daily newspaper, OTHER THAN the student newspaper?

   1. every day ____
   2. at least 4 days per week ____
   3. at least one day per week ____
   4. rarely or never ____

   ____ (60)

6. On the average, how often do you watch <u>news programs</u> on TV?

   a. Local News?

      1. every day ____
      2. at least 4 days per week ____
      3. at least one day per week ____
      4. rarely or never ____

      ____ (61)

   b. National News?

      1. every day ____
      2. at least 4 days per week ____
      3. at least one day per week ____
      4. rarely or never ____

      ____ (62)

7. On the average, how often do you listen to NEWS on the radio?

   1. every day ____
   2. at least 4 days per week ____
   3. at least one day per week ____ (63)
   4. rarely or never ____

8. On the average, about how often do you read news magazines (such as Time, Newsweek, U.S. News)?

   1. about once a week ____
   2. about once every two weeks ____
   3. about once a month ____ (64)
   4. less than once a month ____
   5. rarely or never ____

9. What would you say is the major source of most of your information on nuclear power?

   1. mass media (newspaper, TV, radio, magazines) ____
   2. books and specialized publications (such as journals, science magazines, etc.) ____ (65)
   3. friends, through discussion ____
   4. other -- please specify _____

10. What would you say is the major source of most of your information on traffic safety?

   1. mass media (newspaper, TV, radio, magazines) ____
   2. books and specialized publications (such as journals, science magazines, etc.) ____ (66)
   3. friends, through discussion ____
   4. other -- please specify _____

11. Please write in your major field of study at UT. (67)

_____

Thank you very much for your participation in this study. Please come to the front of the room and turn in your folder. You are then free to leave.

# APPENDIX C

# NUCLEAR ARTICLES

# Blast, Fire Shut Down Pine Nuclear Plant

A transformer exploded and caught fire, shutting down the Unit 1 reactor at the Pine Point Nuclear Power Plant earlier this week, a Nuclear Regulatory Commission (NRC) spokesman said today.

The smoldering fire at the plant, located three miles from the Cherokee County line, was extinguished in 30 minutes, said Henry Duncan, an NRC spokesman in Atlanta. The explosion was heard by area residents, who called authorities, he said.

"No one was injured, and there was no release of any radioactive materials," Duncan said.

Plant officials earlier reported the shutdown, but did not provide details about the explosion or fire.

Agency officials still are assessing the damage to electrical circuitry in the building where the transformer failure occurred Monday night, a plant official said.

Duncan said there were no flames as a result of the transformer failure, but the oil in it became "very hot and vaporized causing smoke." A regularly scheduled maintenance shutdown for two weeks will be implemented beginning next week, a plant official said.

ARTICLE FOR GROUP 2

WITHOUT RADIATION, WITH "NO HARM DONE" STATEMENT

## Blast, Fire Shut Down Pine Nuclear Plant

A transformer exploded and caught fire, shutting down the Unit 1 reactor at the Pine Point Nuclear Power Plant earlier this week, a Nuclear Regulatory Commission (NRC) spokesman said today.

The smoldering fire at the plant, located three miles from the Cherokee County line, was extinguished in 30 minutes, said Henry Duncan, an NRC spokesman in Atlanta. The explosion was heard by area residents, who called authorities, he said.

Plant officials earlier reported the shutdown, but did not provide details about the explosion or fire.

Agency officials still are assessing the damage to electrical circuitry in the building where the transformer failure occurred Monday night, a plant official said.

Duncan said there were no flames as a result of the transformer failure, but the oil in it became "very hot and vaporized causing smoke." A regularly scheduled maintenance shutdown for two weeks will be implemented beginning next week, a plant official said.

ARTICLE FOR GROUP 1

WITHOUT RADIATION, WITHOUT "NO HARM DONE" STATEMENT

# 12 Workers Exposed To Radioactive Gas

A dozen workers at the Pine Point Nuclear Plant were exposed to radioactive gas when a leak developed in a valve used to sample reactor coolant water, officials said yesterday.

Officials at the plant, located three miles from the Cherokee County line, said radiation was discovered on the hands of two employees while 10 others had radioactive particles on their shoes and clothing.

Plant spokesman Henry Duncan said the workers were exposed last night. He said the contamination was picked up on monitors during routine inspection for radiation.

Duncan said the incident occurred at the "chemical volume and control system" inside the auxiliary building which is located adjacent to the containment building for the uranium reactor.

The system is used to control injections of boron into the reactor coolant water. Boron slows down the fission process and can control the reactor's power levels, Duncan said.

The two workers whose skin was exposed to the radioactive materials and the other 10 employees who were contaminated were allowed to return to work when a health physicist said the radiation had decayed.

ARTICLE FOR GROUP 3

WITH RADIATION, WITHOUT "NO HARM DONE" STATEMENT

# 12 Workers Exposed To Radioactive Gas

A dozen workers at the Pine Point Nuclear Plant were exposed to radioactive gas when a leak developed in a valve used to sample reactor coolant water, officials said yesterday.

Officials at the plant, located three miles from the Cherokee County line, said radiation was discovered on the hands of two employees while 10 others had radioactive particles on their shoes and clothing.

Plant officials termed the contamination mild and said it was below exposure limits set by the Nuclear Regulatory Commission (NRC).

"No one was injured, and there was no release of any radioactive materials outside the building," said plant spokesman Henry Duncan.

Duncan said the workers were exposed last night. He said the contamination was picked up on monitors during routine inspection for radiation.

Duncan said the incident occurred at the "chemical volume and control system" inside the auxiliary building which is located adjacent to the containment building for the uranium reactor.

The system is used to control injections of boron into the reactor coolant water. Boron slows down the fission process and can control the reactor's power levels, Duncan said.

The two workers whose skin was exposed to the radioactive materials and the other 10 employees who were contaminated were allowed to return to work when a health physicist said the radiation had decayed.

ARTICLE FOR GROUP 4

WITH RADIATION, WITH "NO HARM DONE" STATEMENT

# VITA

Alice Lois Gagnard was born in Alexandria, Louisiana, on September 16, 1957, the daughter of Mark A. Gagnard and Louise Gremillion Gagnard. She attended St. Frances Cabrini Elementary School, and was graduated from Bolton High School in 1975. After attending Louisiana State University at Alexandria for two years, she transferred to Louisiana State University at Baton Rouge, where she was graduated summa cum laude in Journalism, receiving the University Medal for Academic Excellence as class valedictorian in December 1978. After completing one semester in the School of Social Welfare at that university, she completed a Masters degree in Journalism in August 1980.

Miss Gagnard began graduate study at The University of Tennessee, Knoxville in September 1980 as a teaching assistant in Journalism. In December of 1981 she received the Masters of Science in Adult Education, and was awarded the doctorate in Communications in August 1982. She received the college's Bickel Fellowship and the university's National Alumni Fellowship.

While in high school and college, Miss Gagnard was editor of her campus newspapers, receiving the Cumtux Award at Bolton, the Most Valuable Staffer award at LSU-A, and the Margaret Dixon Memorial Award at LSU-BR. She worked for a year and a half in the LSU Office of Information Services and from 1979-80 as a staff writer for the Baton Rouge State Times-Morning Advocate. During 1982 she worked as a copy editor at the Knoxville News-Sentinel. She has done freelance work for the New Orleans Times-

Picayune, the Baton Rouge Sunday Magazine, the Tennessee Educator, and for the Division of Technical Services for Union Carbide in Oak Ridge, Tennessee.

While at LSU and UT, Miss Gagnard had the opportunity to deliver research papers to various groups, including the Association for Education in Journalism, the Mid-South Educational Research Association, and the College of Communications Research Symposium. She is also a member of the Society of Professional Journalists, and was elected a member of the honorary societies of Phi Kappa Phi, Gamma Beta Phi, Mu Sigma Rho, and Kappa Tau Alpha. She was named to Who's Who in American Junior Colleges in 1976, and to Outstanding Young Women of America in 1981.

The author is an avid tennis player, having won the state high school championship in 1975, and earned a No. 3 women's ranking in Louisiana in 1979 and a No. 2 ranking in Knoxville in 1981. She has taught tennis lessons for the city of Alexandria, Louisiana, and for five years for the Alexandria YWCA.

Upon graduation, Miss Gagnard had accepted an assistant professorship at Marquette University in Milwaukee, Wisconsin, in the College of Journalism.