The Role of Consumer Involvement in Determining Cognitive Response to Broadcast Advertising

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This paper investigates the role of involvement in determining consumer response to radio and TV commercials. After reviewing relevant literature, a summary model that focuses on the amount and type of cognitive elaboration and subsequent effects on consumer recognition of the brand and message points is presented. Hypotheses are developed that predict interaction effects between the type of broadcast media and the level of consumer involvement in the commercial. A study is conducted where mode of presentation (radio versus television) and level of consumer involvement (low versus high) are experimentally manipulated. Analysis of variance of the data provide general support for the hypotheses. Other results and the implications for advertising research and practice are discussed.

Advertising research has provided considerable evidence regarding consumer response to persuasive messages. Numerous models that explain consumers' cognitive, affective, and conative reactions have been advanced and tested. As theories become more detailed, greater discrimination is possible in understanding the important dimensions of consumer response. However, further research is needed on many fronts, including investigations of differences that exist in message processing among alternative advertising media. For example, two types of broadcast media—radio and TV—have obvious differences that could seriously affect the way consumers process persuasive messages. Despite calls for research on these issues (Edell and Keller 1989; Greenwald and Leavitt 1984), few models distinguish between radio and TV message processing.

The importance of these broadcast media to advertisers is evident by the fact that they spent $26 billion on TV and $7.7 billion on radio in 1988 (Marketer's Guide To Media 1989). In addition, these media are often used together in “coordinated media campaigns” (Edell and Keller 1989). To most effectively communicate their message, creative teams and media planners need to understand differences in the way consumers process radio and TV commercials. Knowledge of the particular strengths and weaknesses of different broadcast media would represent a practical advance of marketing communications theory. Accordingly, the purpose of this paper is to review issues relevant to processing differences between broadcast media and to advance a summary model of the important dimensions. In addition, a study is reported that tests the key propositions of the model.

Background Literature

The most basic difference between radio and TV is the number of sensory modes involved. Radio messages consist of only auditory stimuli and audience processing consists of only listening. TV messages project both auditory and visual stimuli, and audience processing consists of listening and viewing.
Processing Auditory Information—Consumer Listening. Listening was defined by Barker (1971) as "the selective process of attending to, hearing, understanding, and remembering aural symbols." This definition focuses upon cognitive processes that register, comprehend, and retain auditory information. The memory component was considered necessary by Barker (1971) because without some lasting vestige of the input stimuli, no real evidence of the entire listening process exists. It is also important to note that people vary in their motivation and ability to perform the necessary steps in listening, making this a complex process not just a simple skill (Barker 1971). In addition, Spearritt (1962) notes that it is important to distinguish between hearing, which is the "mere physiological reception of sound," and listening, which involves both attending to the sounds and attaching meanings to them.

Research on listening frequently examines comprehension and/or recall of auditory stimuli, and results indicate that listening can be a difficult and demanding task. For example, Nichols and Stevens (1957) tested the ability of people to understand and remember what they hear. Results showed that immediately after listening to someone, the average person forgets about one half of what was just said. After two months elapsed time, the average individual could recall about 25 percent of what was said. Another study by Nichols (1957) showed that while 40 percent of a white collar worker's day was devoted to listening behaviors, this group listened at only a 25 percent rate of efficiency.

Bostrom and Waldhart (1980) used three different measures to test listening abilities: (1) short-term listening, (2) short-term listening with rehearsal, and (3) lecture comprehension. These measures were then compared with scores measuring general mental ability. Results showed that short-term listening was a good predictor of oral performance; short-term listening with rehearsal had no apparent relationship to any other measures; and lecture-comprehension listening proved to be a good predictor of written test scores. Based on these results, Bostrom and Waldhart (1980) believe that current conceptualizations of listening behavior need to be revised, and better measurements of listening abilities need to be developed. In addition, closer attention needs to be paid to the listener's short-term-memory processing in order to resolve the many conflicting claims about listening behavior.

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In a similar study, Bostrom and Bryant (1980) tested a hypothesis comparing short-term listening and short-term-memory-processing structures. The results showed that short-term listening is distinguishable from the usual definitions of listening (an "ability" to hear; to attend to) and is different from the kinds of storage processes usually described as short-term memory. Exactly how the process works in relationship with other memory functions was not discussed and awaits further investigation.

Other studies have compared the effectiveness of listening to that of visually presented information. For example, Pauk (1984) found that "remembering what you have heard is usually more difficult than remembering what you have read." This may be due to the fact that one can slow down the rate of reading if necessary, but cannot slow down the rate of listening. Another explanation is that seeing the visual image of printed words processes information at a deeper level than merely hearing words. In the latter case, words often are not given enough time to allow for the construction of a mental image.

Similarly, Siegel and Allik (1973) compared visual and auditory processing effects on children's and college students' short-term memory. Modality of stimuli (visual or auditory) and modality of recall cue (visual or auditory) were both manipulated. Results showed that the recall of visually presented stimuli was superior to the recall of auditory stimuli, while the effect of the modality of the recall cue was negligible. Siegel and Allik (1973) concluded that visual stimuli facilitate performance because a picture can be stored simultaneously in both a visual and an auditory-verbal processing system.

As the review indicates, several aspects of listening research are disturbing from the advertiser's point of view. First, this topic has received limited attention from researchers. Existing models are still in the development stage and often do not consider the impact of important mediating factors such as the individual's motivation and opportunity to process auditory stimuli. Moreover, very little research on consumer listening has appeared in major marketing and advertising journals. This is an important gap, since listening to a person may involve different processing mechanisms than listening to a radio (since visual contact with the source is not an issue in the latter case). Another problem is that much of the research designed to measure a person's listening ability seems to be a better indicator of their general mental ability or skills; valid and reliable indicators of listening have yet to be developed. Certainly, more research needs to be conducted so that advertisers can better understand and manage the auditory component of broadcast messages.

Processing Visual Stimuli—Consumer Viewing. With TV, advertisers have the opportunity to combine visual and verbal stimuli when constructing the persuasive message. Although
significant research has been conducted on consumer processing of visual and verbal material, most of that research has used print rather than broadcast stimuli. For example, Childers and Houston (1984) studied the effects of pictures-only versus pictures and words in print advertisements. They found that pictorial material conveying brand/product class-associations is recalled better than corresponding verbal-only material when each is processed at a sensory level (a shallow, non-stringent form of message processing). They also found that greater sensory discrimination of pictures improves recall over corresponding verbal-only material when each is processed at a sensory level.

However, the picture-superiority effects were eliminated when material is processed at a semantic level (an intense form of elaboration pertaining to the meaning of words or pictures). Indeed, verbal and verbal-plus-visual stimuli were equivalent when processed at the semantic level.

In a continuation of this research, Houston, Childers, and Heckler (1987) investigated consumers' memory for messages in which the semantic content of the pictorial material is (1) consistent with the verbal copy (verbal copy and picture present the same product attributes) or (2) discrepant from the verbal copy (verbal copy states one attribute while picture shows a different attribute). In three separate experiments they also manipulated another independent variable: interactive pictures (pictures that pictorially represent the brand name and product class) versus non-interactive pictures (pictures that bear no relationship to the brand name and may or may not represent the product class). Results indicate that interactive ads were superior to non-interactive ads. Also, using an interactive picture to convey a different product attribute than that presented in the verbal copy used in the ad (discrepant information) increases the audience's recall of the material.

MacInnis and Price (1987) reviewed research on imagery processing (a processing mode in which the information received is represented in a gestalt or total-picture form in the active memory), and contrasted it with discursive processing (a more abstract, symbolic, language-like form of processing). They also suggested some important ways in which imagery impacts consumers' learning, choices, and satisfaction. The authors found that imagery is a process, not a structure, and that imagery affects many cognitive, physiological, and behavioral phenomena. In addition, they found that imagery enhances incidental learning and helps individuals to anticipate the future. MacInnis and Price (1987) conclude that imagery can help consumers with product evaluations, purchase intentions, remembering consumption, and intentions to repurchase.

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Thus, research in print advertising indicates that visual stimuli (and/or creating a visual image from stimuli) enhance message processing and recall under some conditions. While this stream of research is more advanced than the listening research, it also has some limitations. Since most of this research has been conducted with print stimuli, it is reasonable to question whether the same effects will occur with broadcast ads where the consumer has little control over the transmission rate. Finally, it is time to begin developing advertising-response theories that specifically account for processing differences between radio and TV ads.

Consumer Response to Broadcast Advertising

Background. According to the elaboration likelihood model (Petty and Cacioppo 1983), consumers can follow two routes to persuasion. "Central route" processing occurs when involved consumers seek product-related information to diligently consider. Here, cognitive response to the advertising message has been shown to mediate subsequent brand attitudes (Petty and Cacioppo 1983; Petty, Cacioppo, and Schumann 1983). "Peripheral route" processing occurs when uninvolved consumers lack sufficient motivation to pay close attention to message points. Here, brand and ad attitudes have been shown to be mediated by incidental factors (e.g., attractiveness of source) or by affective reactions (e.g., mood states). Other models of advertising response (Greenwald and Leavitt 1984; MacInnis and Jaworski 1989) suggest that superficial cognitive effects can be expected even at lower levels of involvement. Given the importance of cognitive effects in understanding consumer processing, the model developed below focuses on the cognitive dimensions of consumer response to broadcast advertising.

Cognitive Response to Broadcast Advertising. Only one previous study could be found that compared cognitive response to radio and TV ads. Edell and Keller (1989) present a conceptualization and empirical test of how consumers process ads in these two media. In their model, "TV and radio advertising differ in the content, number, and relationship of the sensory modes the viewer encounters" (Edell and Keller 1989, p. 150).

At first glance, it seems that TV is destined to be a more effective advertising medium than radio. This conclusion is based on several facts. First, TV has two sensory-input modes, compared to only one for radio, allowing TV to disseminate more information in the same amount of time. Second, TV makes use of the powerful visual mode and, as
noted above, researchers often find a picture-superiority effect over verbal-only stimuli. Third, TV can create verbal/visual synergy by coordinating both stimuli (i.e., "consistent" ads). Finally, TV viewers seem less likely to be engaged in a distracting secondary task like driving, talking to a friend, studying, or reading the paper.

However, Edell and Keller (1989) question whether TV will always be superior to radio as a persuasive medium. They note that while TV does provide more information to the viewer, this information may require more effort to process. As a result, "it is unclear whether consumers will extract more or less information and meaning from TV ads than from their radio counterparts" (Edell and Keller 1989, p. 150). Second, Edell and Keller note that while some studies show that multiple sensory modes facilitate learning others have found an interference effect. Third, research has shown that it takes time (up to 1.5 seconds) to switch from processing visual to verbal inputs, which may lessen the impact of TV vis-a-vis radio (Edell and Keller 1989). Finally, Edell and Keller note that concurrent distractors (e.g., discrepant verbal and visual components) can inhibit cognitive elaboration and critical thinking. These conceptual considerations are bolstered by findings that auditory presentation of verbal information can indeed result in superior retention (Murdock 1967, 1968, 1969).

What factors might mediate the impact of radio commercials versus TV commercials and allow advertisers to sort out the conflicting theories and results noted above? Several factors seem to play a role including: the type of ad (consistent or discrepant; Houston et al. 1987), whether the consumer is processing the commercial for the first time or has seen it before (Edell and Keller 1989), the existence of a secondary (distracting) task (MacInnis and Jaworski 1989), stimulus complexity (Leigh and Menon 1987), and the level of consumer involvement (Greenwald and Leavitt 1984; Krugman 1965). The goal of this paper is to examine the role of consumer involvement in the processing of broadcast commercials.

**Consumer Involvement**

**Media Differences in Involvement.**

Krugman (1965) was one of the first to note the important differences that exist in consumer processing of print versus broadcast advertising. In developing his "low-involvement-learning hypothesis," Krugman (1965) observed that print media require the active participation of the audience since reading printed words is a relatively demanding cognitive task. Indeed, the "information-processing-parsimony hypothesis" (Holbrook 1978) suggests that consumers attempt to minimize demanding cognitive endeavors and would be unlikely to read information of little interest to them. Greenwald and Leavitt (1984) also note the limited ability of print media to get a meaningful response from uninvolved consumers: "with rapid page turning and only partial scanning of page contents ... critical cues that could attract higher involvement may simply be missed" (Greenwald and Leavitt 1984, p. 590). Thus, print media have limited opportunity to influence uninvolved or passive audience members who are disinclined to read the message.

Conversely, the nature of broadcast media makes them much better suited for influencing passive consumers. The verbal information is spoken and can, therefore, impact consumers who are not actively seeking exposure to the ad message. Similarly, TV graphics can convey information in an interesting and effective manner that requires little cognitive effort from the viewer. Thus, while consumers rarely read print ads that do not interest them, they are often exposed to (i.e., see and hear) broadcast commercials for products with which they are not involved. Indeed, this situation was recognized as the basis for Krugman’s (1965) low-involvement-learning model which he specifically limited to broadcast media.

As a result, the consumer’s level of involvement with the ad, brand, or product category can be expected to play a major role in determining the amount and type of cognitive response. Of significant importance is the fact that both low- and high-involvement consumers can be impacted by broadcast commercials, though perhaps in different ways. This proposition is consistent with Wright’s (1973) model that the consumer’s motivation to cognitively process message points mediates subsequent cognitive and affective reactions.

**Defining Consumer Involvement.**

Involvement is a construct that has been defined and operationalized in many different ways. While no consensus exists, many researchers define involvement as the extent to which a stimulus or task is relevant to the consumer’s existing needs and values (MacInnis and Jaworski 1989; Petty and Cacioppo 1983; Petty, Cacioppo, and Schumann 1983; Wright 1973). Lacznia, Muehl, and Grossbart (1989) reviewed past conceptualizations in advertising studies and established two basic components of involvement in advertising. As consumers become more involved they should (1) pay more attention to the ad message, and (2) focus more on brand processing as opposed to nonbrand processing. Since this conceptualization was specifically developed for advertising research, and captures the essential components of involvement, it will be used as the conceptual basis for operationalizing involvement in this study.

**Effects of Consumer Involvement.**

In many advertising response models, the degree of consumer involvement is expected to influence both the amount and the quality of the consumer’s cognitive response (Wright 1973, 1974, 1975; Greenwald and Leavitt 1984; MacInnis and Jaworski 1989; Edell and Keller 1989). In terms of the amount of cognitive response, it is clear that involved consumers engage in more effortful information-search and acquisition strategies. When actively searching for product-related information, interest in brand advertising is
Accordingly, the term elaboration as used in this paper will refer to the specific constructive process of producing personal connections and not to evaluative processes like support arguing and counterarguing.

Summary Model of Cognitive Response to Broadcast Advertising

Based on the review above, a summary model of consumer response to broadcast advertising can be proposed. Essentially, when consumers are exposed to a TV or radio commercial, processing begins at relatively superficial levels like orienting reactions, selective attention, feature discrimination, or categorization (Greenwald and Leavitt 1984; MacInnis and Jaworski 1989). While print media may not get far (or anywhere) in terms of processing depth for low-involvement consumers (unwilling to read), broadcast media can be missed “only by walking out of the room or by turning down the sound” (Greenwald and Leavitt 1984, p. 590). This conclusion may be somewhat overstated, since distracting secondary tasks or nonattention to the stimulus (e.g., clutter, daydreaming) could create conditions similar to print (i.e., nonregistration of the information) for some viewers.

Notwithstanding this possibility, broadcast media are expected to have some meaningful cognitive impact on a greater number of non-interested consumers. In this respect, low-involvement consumers could engage in superficial processing consistent with Petty and Cacioppo’s (1983) “peripheral route” to persuasion. Here, low-involvement audience members focus on executional aspects of the ad like celebrity endorsers and source attractiveness rather than processing brand-related data. More recent models (MacInnis and Jaworski 1989) describe six levels of processing, and suggest that some superficial brand processing can occur even at low levels of involvement. If consumers are moderately involved with the advertising for a brand they will move beyond superficial analysis and perform more sophisticated processing including comprehension of ad points and evaluative/comparative processing (MacInnis and Jaworski 1989). At high levels of involvement, consumers will elaborate message claims by forming personal connections, bridging experiences, or imagining the product in use (Greenwald and Leavitt 1984; Krugman 1965; MacInnis and Jaworski 1989).

As consumers move to deeper levels of processing, recognition, understanding, and memory of the input stimuli are enhanced (Greenwald and Leavitt 1984; Krugman 1965). This means that as consumers become more involved they can better understand and remember brand-related information. In addition, MacInnis and Jaworski (1989) state that connective elaborations produce “self-generated persuasion” resulting in strong beliefs about the brand. These conclusions integrate well with Craik and Lockart’s (1972) original exposition of the levels-of-processing framework where semantic processing is expected to improve the memory of input stimuli. This is an important point because advertisers are very concerned with consumer’s recall and recognition of ads and frequently measure them with day-after recall and recognition measures. Thus, understanding how involvement and broadcast media interact to effect consumer’s recognition of ad points would be a practical addition to advertising response models.

Hypotheses

Cognitive Elaboration of Advertising. When consumer involvement is low, there is little motivation to cognitively elaborate message claims. Accordingly, low-involvement consumers could be expected to rely on more superficial processing techniques (Greenwald and Leavitt 1984) and/or to be influenced by peripheral ad factors (Petty and Cacioppo 1983). In these circumstances, little evidence of elaborative processing is expected in
consumers’ cognitive responses. Specifically, when only rudimentary processing occurs, there should be few personal connections in response to either radio or TV commercials.

However, at high levels of consumer involvement, greater motivation exists to cognitively elaborate message claims. In this case, radio seems to offer more opportunity to generate meaningful elaborations than TV. Without strong visual cues to guide them, involved consumers are likely to generate their own visualizations/connections/elaborations in response to radio ads. These highly personal, self-based elaborations are generally expected to provide a very deep level of processing and to produce a powerful cognitive impact. For example, Edell and Keller (1989, p. 151) note that “... self-generated visualizations from the radio ad may be more personally relevant than the TV ad’s video.” Accordingly, when highly involved consumers are exposed to radio commercials, they should freely generate powerful self-based cognitive elaborations of message points.

TV, however, seems to place two limitations on the amount and type of cognitive elaboration performed. First, TV may offer less opportunity for cognitive elaboration because by presenting more information (two sensory input modes), it places greater demands on the limited-capacity short-term memory. In this case, processing TV commercials requires more of the short-term memory’s capacity, thereby reducing processing resources available for elaborations. Second, because of the visual cues provided, TV seems to encourage ad-based elaborations as opposed to the more potent self-based elaborations.

When considered together, the relationships reviewed above suggest an interaction effect between the type of broadcast media and the level of the consumer’s involvement in the ad.

**H۱:** Under conditions of low involvement there should be no difference in the number of personal connections between radio and TV. Under conditions of high involvement, consumers exposed to radio commercials should produce a significantly greater number of personal connections than those exposed to TV commercials.

If these effects occur, important implications exist for advertising effectiveness. As noted above, visual stimuli enhance the consumer’s ability to process superficial aspects of ad information. It seems reasonable to extend this proposition to broadcast commercials as well. Thus, when consumers lack sufficient motivation to elaborate message points, the cognitive impact of commercials will be determined by relatively superficial processing, since few elaborations occur (H۱). In these cases, picture-superiority effects are predicted, since feature discrimination of message points should be aided by visual stimuli. Radio, with only one sensory mode, will have a more difficult time attracting attention and creating meaningful feature recognition among low-involvement consumers. This reasoning is consistent with previous findings of picture-superiority effects at superficial processing levels in print media (Houston, Childers, and Heckler 1987).

However, when consumers are highly involved in the ad message the superficial processing advantage of TV should be counterbalanced by the elaborative advantages of radio (H۱). In the sequence of advertising response, TV gains its advantage in the early stages of processing, while radio gains its advantage at the deeper levels. When consumers go all the way to elaborative processing, TV is still expected to realize advantages in the early stages, but, these gains will be offset by radio’s advantages at the deeper levels. Thus, measures of ad impact, like recognition of the brand or ad points, should show no difference in the effectiveness between radio and TV commercials, for highly involved consumers. Again, interaction effects are predicted between level of involvement and type of media with respect to ad and brand recognition.

**H۲:** In conditions of low consumer involvement, TV commercials will have significantly greater cognitive impact (in terms of recognition of brand and ad points) than will radio commercials. However, in conditions of high consumer involvement, there will be no significant difference in the cognitive impact (recognition of brand and ad points) of TV versus radio commercials.

**Methodology**

To test the hypotheses, a 2 X 2 factorial design was used. The main independent variables were type of broadcast media (radio or television) and level of consumer involvement (low or high).

**Target Commercials.** To test the hypotheses, a commercial was needed that had several important characteristics. First, the commercial should contain verbal material that was relevant for either broadcast mode. Second, the commercial should be new to the subjects to avoid previous exposure effects. Third, the commercial should be realistic and considered reasonably effective to make the test fair. Fourth, the commercial should be for a product that the subject pool (college students) uses frequently and considers buying to make the experiment realistic. A target ad that met these criteria was selected from 45 award-winning regional commercials as reviewed by *Advertising Age* (1986).

The test commercial selected was a 30-second informational computer commercial for a major national brand. As summarized in the Exhibit, the commercial had both strong verbal copy (which mentioned several important product attributes), and strong visual elements (that were consistent with the verbal copy), making it potentially effective as either a radio or TV spot. The commercial was three years old and had been played only in west coast markets. None of the subjects reported seeing the commercial previous to the experiment.
EXHIBIT

Summary of Experimental Advertisement

<table>
<thead>
<tr>
<th>Summary of Visual Stimuli:</th>
<th>Verbal Stimuli:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Man standing facing chalkboard. His left hand is drawing a profile of a man, his right hand is writing an equation.</td>
<td>&quot;Imagine a brain whose left side is as brilliant as its right. A brain as artistic as it is logical. That can calculate ... and create.</td>
</tr>
<tr>
<td>2. Zoom to right hand calculating a mathematical equation.</td>
<td>Such a brain exists in the remarkable new ...</td>
</tr>
<tr>
<td>3. Zoom to left hand drawing the eye area of the portrait.</td>
<td>Apple II GS. Brilliant graphics ...</td>
</tr>
<tr>
<td>4. Scan chalkboard from left to right showing man drawing and solving a mathematical problem at the same time.</td>
<td>brilliant color ...</td>
</tr>
<tr>
<td>5. Picture of computer monitor with multicolored geometric ball bouncing around the screen.</td>
<td>brilliant sound.</td>
</tr>
<tr>
<td>6. Butterfly flapping its wings now on computer screen.</td>
<td>To help you use both sides of the most personal computer of all—your mind:&quot;</td>
</tr>
<tr>
<td>7. Man playing saxophone with horizontal lines and dots flashing in the background.</td>
<td></td>
</tr>
<tr>
<td>8. Return to chalkboard and man. Pan out to show complete drawing and equation.</td>
<td></td>
</tr>
</tbody>
</table>

To enhance external validity, the target commercial was preceded by a 60-second beer commercial and followed by a 30-second wine commercial. This three-spot commercial pod was then inserted into a four-minute section of video material taped from Entertainment Tonight. The sequence of exposure was: three minutes of program content (discussing Carol King’s musical career), two-minute commercial pod (beer commercial, target commercial, wine commercial), one minute of concluding comments from the program (summary and sign off).

Type of Broadcast Media. Manipulation of the media variable was very direct. In the TV treatment, the videotape was played on a large TV monitor so subjects could see and hear the stimuli. For the radio treatment, the audio portion of the tape was transferred directly to an audio cassette to produce a high quality message. This cassette was played on a large portable radio similar to the type used by many students.

Level of Involvement. Manipulation of the involvement variable was accomplished by giving different experimental instructions to the groups. As noted, the conceptualization of Laczniak, Muehling, and Grossbart (1989) suggests that two factors must be manipulated to create differences in involvement (the amount of attention paid to the commercial, and the amount of brand processing performed). Accordingly, high-involvement subjects were given instructions to maximize attention to the ad and the amount of brand processing.

Thank you for your time. This is a study about how consumers use advertising information to form opinions about products. You will be shown (hear) a segment from the program Entertainment Tonight that contains a block of three advertisements. The first ad is for a brand of beer and the third ad is for a brand of wine. Your task is to view (listen to) this program segment and determine if these alcoholic ads are appropriate for teens to watch (hear). Therefore, after viewing (listening to) the alcoholic beverage ads, think about whether they are suitable for programs with teenage viewers in the audience.

To verify that these instructions produced the intended results, manipulation check measures were included in the study. Laczniak, Muehling, and Grossbart (1989) recommend testing involvement manipulations by using a 5-item scale to measure the amount of attention allocated to the target ad, and a 4-item scale to measure the degree of brand processing. These measures have been examined for validity and reliability (Laczniak, Muehling, and Grossbart 1989), and represent a method for directly checking involvement manipulations. These scales required only slight modification for use with broadcast media and were placed at the end of the questionnaire to minimize sensitizing subjects.
Dependent Variables. Cognition listing. Subjects were asked to list all thoughts, reactions and/or ideas that went through their minds while watching (or listening) to the computer ad. This technique is a common method for extracting consumer cognitive response to advertising, and has been used in many studies (see Wright 1980 for a review). As usual, three minutes were allowed for subjects to complete this task.

Each of the resulting “primary thoughts” was coded on three specific dimensions. First, was the type of response: product-related, message-related, source-related, or unrelated. Second was the intent of the thought: positive, negative, neutral, or curiosity. These two coding schemes were selected because they have provided useful categories in past cognitive-response studies (Smith and Swinyard 1983, 1988, MacKenzie and Lutz 1989). Third, each thought was examined for the presence of personal connections or elaborations. Advertising elaborations or “bridging experiences” occur when consumers relate the product or ad to meaningful aspects of their own lives.

Definitions of these variables (shown in the Appendix) were given to two graduate students who served as judges. Each learned the necessary definitions and then practiced the coding scheme on example statements. Finally, each judge was given a photocopy of the subject's cognitive responses (to avoid revealing the treatment condition) for final coding. Interjudge agreement was 86.3 percent for the type of thought, 88.0 percent for the intent of the thought, and 92.4 percent for the presence of personal connections. Disagreements were resolved by a third judge.

Recognition of brand name. After the subjects completed the cognition-listing task, they were given a recognition measure for the brand name of the advertised computer. This measure was a multiple-choice question followed by four alternatives. Credit was given for correct answers while no credit was given for incorrect or missing answers.

Recognition of commercial points. Subjects were then tested on their ability to recognize the product-related information provided in the computer commercial. This recognition test consisted of five multiple-choice questions regarding the content of the commercial. Each question was followed by four alternatives, one of which was correct. Again, credit was given to each correct response while no credit was given for incorrect responses or unanswered questions.

Attitude Toward the Advertisement. This variable was included in the study because it has been shown to mediate commercial effectiveness in some situations (MacKenzie and Lutz 1989). Subjects were asked to rate their attitude toward the commercial on three semantic-differential scales (extremely good-extremely bad, extremely pleasing-extremely irritating, extremely interesting-extremely uninteresting). These scales were selected because they have been used effectively in past A\textsubscript{ad} studies (MacKenzie and Lutz 1989).

Procedure. Eighty undergraduate seniors at a large midwestern university were given course credit for completing the study. Subjects were randomly assigned to one of the four treatment conditions. Results of questions designed to verify that students were appropriate subjects showed that 82.5 percent currently used personal computers, and 97.5 percent planned to use a personal computer in the next year. In addition, 10 percent currently owned their own computer and 17 percent planned to buy one within the next year. This suggests that college seniors are a prime target market for personal computers, and thus, were acceptable subjects for the study.

Upon arrival at the experiment room, subjects were read a statement designed to reduce demand characteristics. Then, subjects both read and listened to the experimental instructions noted above. At this point, the subjects viewed or listened to the program and commercials. Viewing/listening took place in groups of ten subjects spaced far apart. After the media exposure, subjects completed the cognition-listing task and filled out the remaining questionnaire items. The entire procedure took approximately 20 minutes per group and the same two graduate assistants administered each of the eight groups. Total elapsed time for the experiment was about three hours. After completion of the testing process, students were excused and given no further information regarding the purpose of the experiment until all subjects had finished.

Validity. Three precautionary steps were taken to reduce demand effects. First, the introduction contained a disclaimer stating that the researchers were in no way connected with any broadcast programs and that the tone (positive or negative) of the subjects' responses was not important; only honest opinions mattered. Second, the order of scale responses (positive to negative) was alternated in order to avoid "yea-saying" response patterns. Third, subjects were not aware that different media and involvement treatments were applied to other groups. Finally, students were asked if they guessed the purpose of the study. No student was able to guess the true purpose of the study.

Reliability. Coefficient alpha was computed for the multiple-item scales. Results show that for the 3-item A\textsubscript{ad} scale, \( \alpha = .92 \); for the 4-item brand-processing scale, \( \alpha = .90 \); and for the 5-item attention-to-the-ad scale, \( \alpha = .95 \). These values indicate the scales had high internal consistency.

Analysis and Results

Manipulation Check. The 5-item consumer-attention scale and the 4-item brand-processing scale were analyzed using ANOVA. Results, shown in Table 1, indicate that the main effect for consumers’ attention to the ad was significant (\( p < .001 \)) between the low- and high-involvement groups. Brand-processing responses were also significantly different between involvement
groups (p < .001). In addition, group means showed that low-involvement subjects were below the midpoint of the scales for both attention (3.39) and brand processing (3.01). Conversely, high-involvement subjects were above the midpoint of the scales for attention (5.62) and brand processing (5.02).

In addition to the manipulation-check items, examination of the cognitive responses also supports the validity of the involvement treatment. As shown in Table 1, low-involvement consumers generated significantly more unrelated thoughts, while high-involvement subjects generated significantly more total thoughts, product thoughts, and message thoughts. Together these findings provide strong support for the success of the involvement manipulation.

**Hypothesis Testing.** The number of elaborations and the ad/brand-recognition measures were subjected to analysis of variance. The results, shown in Table 2, indicate that the predicted interaction effect is marginally significant (p < .10) for the number of elaborations, and significant (p < .05) for the ad- and brand-recognition measures. These findings are taken as moderate support for H1 and support for H2.

However, because of the directive nature of the hypotheses, an appropriate and more sensitive analysis technique is a priori contrasts. Here, the key comparisons stated in the hypotheses are tested using the t statistic. Hypothesis 1 predicted that there would be no difference in the number of elaborations between TV and radio for low-involvement consumers. As shown in Table 3, the cell means are similar and the a priori contrast is not significant as predicted in H1. Hypothesis 1 also predicted that radio subjects would produce significantly more elaborations than TV subjects under conditions of high involvement. As shown in Table 3, the cell means are in the expected direction and the a priori contrast is significant at the p < .01 level.

Hypothesis 2 predicted that in the conditions of low involvement, TV commercials would generate more
brand and ad recognition than radio commercials (i.e., picture-superiority effects at superficial processing levels). As shown in Table 3, the cell means are in the expected direction and the a priori contrasts are significant for both brand recognition (p < .01) and ad recognition (p < .001). Hypothesis 2 predicted no difference in the brand- and ad-recognition scores for radio and TV subjects who have high involvement with the commercials. This was because TV’s cognitive advantages at superficial processing levels would be offset by radio’s cognitive advantages at the elaborative processing levels for involved consumers. As shown in Table 3, the cell means are similar and fail to approach statistical significance as predicted in H2.

The effects of the media-by-involvement interactions on the dependent variables of elaborations, and brand and ad recognition are summarized in Figures 1-3. Together these findings are considered to support the hypotheses.

Post Hoc Analysis. In addition to formal hypothesis testing, a post-hoc analysis was conducted by examining the cognitive responses for significant (ANOVA) main effects. Results showed interesting patterns of response on two dimensions: (1) the focus of cognitive response and, (2) the favorability of cognitive response. As shown in Table 4, subjects exposed to TV commercials produced significantly more message-related thoughts and marginally fewer product-related thoughts. This indicates that the focus of consumer’s cognitive responses reflect more of a brand-processing orientation for radio commercials and more of a message-processing orientation for TV commercials.

In terms of the favorability of cognitive response, analysis (shown in Table 4) indicates that, in this study, subjects exposed to TV commercials reported more positive thoughts, though this effect was only marginally significant (p < .10). No difference was found in the number of negative thoughts between the two broadcast media. While Edell and Keller (1989) did not extract cognitive responses, they did find that TV subjects had more positive attitudes toward the commercials than radio subjects. This is important because $A_w$ has been shown to mediate brand attitudes in a variety of situations (MacKenzie and Lutz 1989; MacKenzie, Lutz, and Belch 1986; Mitchell and Olson 1981). Examining this issue in terms of the data collected here (Table 4), TV subjects developed significantly more favorable attitudes toward the ad than radio subjects, replicating the findings of Edell and Keller (1989).

Limitations

Before discussing the implications of this study it is important to properly delimit its scope. First, the results reported here were obtained after only one exposure to the target ad. Thus,
Third, this study investigated cognitive reactions to broadcast commercials. Affective responses such as emotions or mood states may show different response patterns. The extent to which radio commercials can evoke elaborations of an affective nature vis-a-vis TV is another area where future research is needed.

Finally, this study employed a convenience sample of college seniors. It is possible that this group has better cognitive skills than average consumers, which may enhance cognitive processing, especially for subjects in the low-involvement treatment. If true, however, this artifact would make it more difficult to observe the effects hypothesized in this study.

Implications

Past Research. A review of past research on listening and viewing demonstrated significant gaps in our knowledge of how consumers process broadcast advertising. Listening is a very important dimension of consumer response to radio and TV commercials, but little empirical or theoretical work has been reported in the marketing and advertising journals. While some interesting research has developed for verbal and visual processing for print ads, tests using broadcast media are just beginning. Given the importance of broadcast media it is clear that substantially more research is needed. Future broadcast-advertising research is needed in order to develop a conceptual model of processing differences. This will allow advertisers to better understand and respond to consumers’ information-processing needs.

Personal Connections. The degree of cognitive elaboration a consumer undertakes with regard to an advertising message has been theorized to significantly impact other important response variables like recognition of brand and ad points. This study found that the amount of cognitive elaboration, in the form of personal connections or bridging experiences, did vary systematically depending on type of media and level of involvement. Moreover the differences in personal connections predicted subsequent differences in consumers’ recognition of brand and message points. This means that the amount of personal elaboration is an important dimension of consumer cognitive response that should be studied in much more depth.

Especially under conditions of high involvement, the amount and nature of cognitive elaboration is crucial. Future research is needed on this topic to provide more specific scaling techniques for personal connections. For example, it is common to use the cognition-listing method to collect consumers’ cognitive responses, but analyzing those responses for personal connections is rare. In this study, the mere number of personal connections was found to be important. Future research should investigate other meaningful aspects. For example, self-based connections have been hypothesized as more personally relevant and thus, could have a different effect than cue-based elaborations. This is a fertile area for future research and would represent continued development in the coding of cognitive responses.

Involvement Manipulation Checks. Another implication drawn from this research regards the involvement manipulation and the scales recommended by Laczniak, Muehling, and Grossbart (1989) to validate involvement manipulations. The scales, slightly altered to adapt them from print ads to broadcast commercials, performed well. Coefficient alphas were high for both the 5-item ad-attention scale and the 4-item brand-processing scale. These findings are similar to those reported by Laczniak, Muehling, and Grossbart (1989), and extend the external validity of the scales to media other than print. In addition, the results from the cognitive-response analysis showed that high-involvement subjects generated significantly more total thoughts, more product thoughts, more message thoughts, and fewer unrelated thoughts than did
the low-involvement subjects. These results using a different scaling method add convergent validity to the Laczniak, Muehling, and Grossbart (1989) scales. This suggests that researchers seeking to manipulate audience involvement can effectively validate their treatment by using these scales.

Involvement by Media Effects. Results of this study showed that at low levels of consumer involvement, ad processing is superficial, and few personal connections occur. In these cases, TV, with dual input modes, can be expected to achieve more cognitive impact on consumers, resulting in greater recognition of brand and message points. Thus, TV with visual and auditory stimuli appears well suited to attract meaningful attention to the commercial, even from uninvolved consumers. While the processing at this level is superficial, it can nonetheless be effective, especially with repetition over time. Particularly in product categories where brand differences are small and the consequences of a non-optimal choice minimal, superficial recognition of brand and ad points could play a significant role in determining choice. In these cases the higher cost of TV commercials seems reasonable as they provided significantly greater recognition of brand and ad points than the radio commercials tested here.

However, when consumers are involved, the cognitive impact of radio versus TV messages changes significantly. Here, radio was shown to produce significantly more personal elaborations than the TV commercials. These results are thought to be caused by the greater opportunity to elaborate radio claims made possible by the fact that no visual stimuli are presented to (1) use short-term-memory capacity, and (2) cue elaborations to visual elements that may not be personally relevant to the consumer. When consumers are motivated to elaborate message claims, recognition of brand and ad points for radio commercials is equivalent to that of TV. Here, the cost differences between radio and TV may not be warranted, suggesting that radio might be a very cost-effective medium for advertisers promoting products and services to involved consumers.

Managing Involvement. Research has demonstrated that consumer involvement is a dynamic concept that can depend on aspects of the situation, the product, the advertisement, or the consumer's response process. In addition, involvement can be temporary and/or recurring (e.g., buying a new car every five years), or can have its own life cycle (e.g., hobbies in which one loses interest). This makes managing involvement a challenging task for advertisers. Nevertheless, some generalizations can be drawn. First, some products are naturally more involving than others. Those with high cost, high perceived risk, a lengthy life expectancy, or significant consequences of a sub-optimal choice can be expected to receive more attention and elaboration in the consumer's decision-making process. For products that fit these criteria, the use of radio in the media mix should be considered, since consumers will often be motivated to engage in elaborative processing.

Products that are less naturally engaging (i.e., low cost, low risk, short life expectancy, little consequence of a sub-optimal choice) are less likely to induce elaborations in the decision-making process. Here, two recommendations can be made. First, higher degrees of involvement can be attained by creating commercials that are themselves involving. Such commercials would be especially useful for advertisers of low-involvement products that include radio as a significant element in the media mix. Radio commercials that stimulate consumers to elaborate the copy points and the brand name can be very effective. Second, the results here indicate that TV is a very effective medium for advertising products to low-involvement consumers.

Post Hoc Analysis. Post hoc analysis of media main effects found that consumers exposed to TV commercials produced significantly more message thoughts, but significantly fewer product thoughts. This suggests that the dual input modes of TV can be useful in attracting attention, but that this increased focus on the ad can come at the expense of brand-processing activities. For advertisers traversing the peripheral route, this is not necessarily a disadvantage since ad cues, or affective moods created, could be the basis for an effective campaign.

However, when the advertiser seeks to follow the central route to persuasion, the situation changes. Here, high-involvement consumers seeking to diligently consider product-related information do not need to be coaxed into listening/viewing. In these cases, heavy use of executional elements to attract attention is not necessary and may interfere with brand processing since some attention is diverted to the executional aspects. Thus, advertisers seeking to follow the central route to persuasion are advised to include radio in the media mix, since it can facilitate brand processing.

Another main-effect finding of interest was that consumers liked the TV commercial better regardless of involvement. This result may simply indicate that the commercial (originally designed for TV) was better suited to that medium. However, the commercial was specifically chosen because it had reasonably strong radio presence and was very effective in the high-involvement radio group. Also, the same effect was reported by Edell and Keller (1989) using different commercials. Another explanation is that in conditions of low involvement, consumers enjoy processing TV commercials more than radio commercials because: (1) more sensory inputs are stimulated, (2) TV spots are more entertaining, or (3) the TV spots require little cognitive effort to process superficially (even though more information is involved). Thus, when involvement is low, TV is not only better liked, it is also more effective. This combined effect suggests that TV is better suited for promoting
products of relatively little interest to consumers.

At higher levels of involvement, radio requires more cognitive effort to elaborate the claims (since no visual cues are provided) and consumers may find this task effortful, and thus, less enjoyable (thereby causing lower A_u&s for radio subjects). However, this may not be a negative effect in the long run since the diligent cognitive labor may generate more relevant and long-lasting impressions of the brand and/or ad. In this study the better liked TV ads were no more effective than radio ads under conditions of high involvement. While these explanations are somewhat speculative at this point, this issue is important enough to warrant future research.

Conclusion. After finding little previous research on consumer-processing differences between radio and TV commercials, a preliminary model of how consumers respond cognitively to broadcast commercials was developed. A test of the model showed that the level of consumer involvement played a significant role in determining the number of personal connections and subsequent recognition of brand and copy points. While this is thought to be a useful point of departure, considerably more research is needed to develop a complete model of broadcast advertising differences. Continued research along these lines will aid creative teams and media planners in their efforts to produce and deliver the most effective marketing communications possible.

References

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APPENDIX
Coding Definitions for Cognitive Responses

I. Type of Thought:
A. Product-Related Thoughts. These thoughts refer to the brand or product class (computers).
   They include:
   1. Identification and/or evaluation of product attributes.
   2. Statements related to the performance of the product.
   3. Statements related to the consequences of using the product.
   4. Questions about the brand or product class.
   5. Statements indicating how the product could solve a problem.
B. Message-Related Thoughts. Any thought that identifies or evaluates execution aspects of the advertising message.
   1. Statements regarding the effectiveness of the ad.
   2. Statements expressing interest in the ad.
   3. Questions about the ad.
   4. Statements regarding attributes of the ad.
C. Source Related Thoughts. The source is defined as the perceived purveyor of the message. This category includes any thought that relates to the credibility and/or effectiveness of the source of product information (references to the “advertiser” or the “source”). In this study the source would be the sponsor/manufacturer (Apple referred to as a company rather than as a product).
   1. Statements regarding the perceived expertise of the source (i.e., the ability of the source to make accurate assertions).
   2. Statements regarding the perceived trustworthiness of the source (i.e., the willingness of the source to make accurate assertions).
   3. Statements regarding the effectiveness of the source (i.e., the source’s likability, similarity, confidence, status, etc.).
D. Unrelated Thoughts. All thoughts not fitting the above categories.

II. Intent of Thought:
A. Positive Statements. Any statement that is in favor of or otherwise supports the product/message/source.
B. Neutral Statements. Declarative statements regarding the product/message/source that do not indicate a favorable or unfavorable intent.
C. Negative Statements. Any statement that is unfavorable toward the product/message/source. Any question that derogates or challenges assertions made about the product/message/source.
D. Curiosity Statements. Any statement that expresses a desire for additional information about the product/message/source. These statements are distinguishable from negative statements based on your judgment of the subject’s intent.

III. Presence of Personal Connections:
Thoughts are considered personal connections if respondents connect the brand, product class, or elements in the advertisement to aspects of their own life (e.g., “I thought about using the computer,” or “This computer would be great for my accounting problems.”)