The authors review the two-factor elaboration model of message repetition effects and report a study of the model’s applicability to new product advertising. The study findings do not support the hypothesized inverted-U relationship between repetition and attitude toward a novel commercial and product. However, the underlying processes of learning, tedium arousal, and elaboration were observed. Viewer knowledge and commercial length did not moderate these processes.

Effects of Television Commercial Repetition, Receiver Knowledge, and Commercial Length: A Test of the Two-Factor Model

The effects of repeated exposure to an advertising message have long been of considerable basic and pragmatic interest to marketers. Early research on the effects of repetition was motivated by the need to estimate the parameters of a repetition function to be incorporated into advertising media models (Aaker 1975; Little and Lodish 1969; Ray and Sawyer 1971a, b; Ray, Sawyer, and Strong 1971). Subsequent research examined the effects of advertising repetition on more general outcome measures such as attitudes, recall, and behavioral intention (Ginter 1974; Gorn and Goldberg 1980; Mitchell and Olson 1977; Winter 1973). More recently, research efforts have shifted toward a consideration of the underlying processes that create the various observed responses to an advertising message after multiple exposures. Researchers adopting the latter avenue of inquiry are attempting to show how the effects of repetition might be explained by message-receiver-generated cognitive responses (Belch 1982; Calder and Sternthal 1980; Sawyer 1981; Wright 1980).

The theoretical explanations offered for the observed repetition effects have been borrowed from the social psychology literature rather than originating within advertising and marketing communication research. In particular, Berlyne’s (1970) two-factor theory and the two-factor cognitive response model by Cacioppo and Petty (1979, 1980) have been thought to hold promise for explaining past empirical results in marketing. Much more research, however, is warranted to test the appropriateness and practical utility of these theoretical accounts (Cacioppo and Petty 1980; Sawyer 1981). Specifically, additional research is needed to determine whether the two-factor model and the processes (learning and tedium) presumed to underlie attitude formation are appropriate for describing audiences’ response to repeated advertisement exposures. We report a study designed to test the two-factor model within a new product advertising context. To provide a more thorough test of the model, the ad-processing-related variables commercial length and receiver knowledge were incorporated in the experimental design.

THEORETICAL BACKGROUND

In 1968, Zajonc developed the empirical generalization that mere exposure is sufficient to produce increased positive attitude toward a novel object. This exposure effect has been replicated under many conditions. Other studies, however, have found moderation effects (i.e., an inverted-U-shaped curve) or novelty effects (i.e., a decrease in affect with repeated exposure). Several theories—response competition, optimal arousal, and two-
factor—have been proposed to explain these effects. Of these, the two-factor theory seems to have a degree of face validity and has been considered a potentially worthwhile approach within more natural communication-processing environments (Belch 1982; Sawyer 1981).

The two-factor theory suggests that two opposing factors determine attitude toward a repeatedly viewed stimulus (Figure 1). First, during initial exposures an increasing net positive affect is observed which is postulated to be due to (1) a reduction in uncertainty and conflict toward the initially novel stimulus (Berlyne 1970) or (2) an increasing opportunity to learn more about the stimulus (Stang 1975). Next, at higher levels of exposure a negative response begins to dominate which leads to a decrease in affect toward the stimulus. This negative response is posited to be due to boredom, decreased incremental learning, satiation, reactance, and/or tedium (Sawyer 1981). The net effect of these two opposing factors is an inverted-U relationship between number of exposures and attitude.

More recently, Cacioppo and Petty (1979, 1980) postulated that the attitudinal effects of message repetition are mediated by the elaborations (i.e., counter and support arguments) that viewers generate when exposed to advertisements. Taking a two-factor perspective, Cacioppo and Petty (1980) propose that repeated exposure through moderate levels of repetition acts primarily to provide additional opportunity for attending to, thinking about, and elaborating upon the message arguments. This additional processing opportunity enables the message recipient to realize the message arguments' cogency and favorable implications which, in turn, enhances persuasion. At high levels of message repetition, however, reactance and/or tedium begin to dominate processing and focus recipients' cognitive energies on counterarguing, thereby decreasing persuasion. In combination, these opposite processes bring about the inverted-U relationship between repetition and message acceptance.

Advertising research has identified additional variables that may further influence receivers' opportunity and/or ability to elaborate. In particular, the variables receiver knowledge and commercial length are seen as being managerially important factors and have been noted for restricting or enhancing the extent and nature of cognitive elaboration (Bogart and Lehman 1983; Edell and Mitchell 1978; Gardner 1983; Olson, Toy, and Dover 1982; Webb 1979; Wells, Leavitt, and McConville 1971; Wheatley 1968). For example, Edell and Mitchell (1978) suggest that receivers' elaboration is based in part on relevant knowledge structures. The specific content of these structures is presumed to determine the number, type, and content of cognitive responses to advertisements. Hence, when considering repetition effects, one might reasonably expect differences in receiver knowledge to affect viewers' rates of learning, tedium arousal, and attitude formation.

Similarly, message length has been shown to affect receivers' processing of a persuasive message (Calder, Insko, and Yandell 1974). In an advertising context Wells, Leavitt, and McConville (1971) and Wheatley (1968) found that the longer commerical resulted in different viewer responses. In the Wells et al. study the longer commercial, though similar in format and theme to the shorter version, presented more product usage vignettes which increased the opportunity for the respondents to elaborate on the message. The larger number of vignettes was thought to have caused respondents to engage in more counterargumentation which led to a more negative attitude toward the advertisement. Wheatley also reported that commercial length affected viewers' attitude toward the ad. Though these studies did not specifically assess the extent and nature of cognitive responding, the results suggest that commercial length may influence receivers' elaboration and thus possibly moderate repetition effects.

The two elaboration-related variables, receiver knowledge and commercial length, help define a richer framework in which to test the appropriateness of the two-factor theory. In general, one might propose that the curvilinear repetition-attitude relationship is most likely to be observed when message arguments and product features are illustrated in a larger number of usage settings (i.e., under conditions of a longer commercial) and when viewers are highly knowledgeable and capable of faster initial processing of the information contained in the advertisement. Beyond this general proposition, several specific and interrelated research issues pertaining to the appropriateness of two-factor theory can be identified.

1. The effects of process-related variables on the extent of learning.
3. Specification of appropriate affect criteria within the advertising context.
4. Development of an advertising-context-relevant cognitive response typology to describe viewers' elaboration during repeated exposures.
5. Determination of the relationship between elaboration activity and the various affect criteria.

Learning

Two-factor theory suggests that repetition of a stimulus provides an opportunity for learning. Indeed, numerous studies have shown that repetition leads to better recall of message content (Belch 1982; Cacioppo and Petty 1979; Sawyer 1981; Sawyer and Ward 1979). On the basis of these studies and our preceding discussion of commercial length and receiver knowledge, we hypothesize that

\[ H_0: \text{Familiarity with and recall of a novel television commercial will increase as exposure frequency increases, particularly for high knowledge individuals exposed to the longer version of the experimental commercial.} \]

Tedium

The two-factor model further postulates that at higher levels of repetition, reactance or tedium influences attitude toward the stimulus negatively. Cacioppo and Petty (1979) hypothesize that at higher levels of re-exposure, tedium or reactance motivates a recipient to attack the now-offensive message and thus results in renewed argumentation and decreasing agreement with the message.

Despite its major role in the explanation of repetition effects, tedium has not been assessed explicitly in any of the past empirical studies. Rather, evidence has been collected and found to be either consistent or inconsistent with the tedium hypothesis. Until the effect of repetition on receiver tedium is assessed directly, one cannot verify the development of tedium in response to television commercial repetition nor its effect on responses to the commercial.

In their discussion of tedium, researchers seem to have conceptualized this factor as an increasingly negative feeling and reaction toward experiencing the stimulus again. This conceptualization is the basis for the measures of tedium used in our study, and we hypothesize that

\[ H_0: \text{Tedium increases as the frequency of exposure increases, particularly for high knowledge individuals exposed to the longer commercial.} \]

Attitude Criteria

In the early mere-exposure experiments affect toward the stimulus was the criterion of interest and was operationalized by having subjects guess the goodness/badness of Turkish or Chinese characters (Zajonc 1968). Similarly, Stang (1975) had subjects rate Turkish words for pleasantness. In the Cacioppo and Petty series of experiments (1979, 1980), affect was operationalized by having subjects rate their level of agreement with an advocacy message.

Single measures of this type may not be sufficient to capture the complexity of consumer response to a television commercial. As a result, the conceptualization and operationalization of appropriate affect criteria within an advertising context pose some additional challenges. In a review of research on advertising's affective qualities, Silk and Vavra (1974, p. 168) were prompted to note that the concept of affect had not been defined clearly in either theoretical or operational terms. Consequently, we find a variety of affect-related measures in advertising and marketing communication studies including attitude toward the product/brand, attitude toward purchasing and/or using the product, and attitude toward the company, as well as attitude toward the advertisement. Only recently have researchers attempted to unravel the relationships among these constructs (Mitchell and Olson 1981; Shimp 1981). What is important for purposes of the current research is whether or not exposure frequency affects these constructs in the same manner. To explore this question, we hypothesize that

\[ H_0: \text{Within an advertising context the favorability of several affect-related measures (i.e., attitude toward the commercial, attitude toward the product, purchase intention, and attitude toward the company) increases with moderate levels of exposure, then declines after high levels of exposure, particularly for high knowledge individuals exposed to the longer version of the experimental commercial.} \]

Cognitive Elaborations and Repetition

The cognitive response version of the two-factor model suggests that the relationship between repetition and attitudes may be explained by the cognitive responses message recipients are able and motivated to produce. Cacioppo and Petty (1979, 1980) introduce the distinction between "content-relevant" and "content-irrelevant" cognitive elaborations to explain the inverted-U relationship between repetition and attitude. In their experiments elaborations were designated as content or topic "relevant" if they had a non-neutral valence with respect to message's point of view. Through a complex partialing procedure Cacioppo and Petty show that content-relevant elaborations were responsible for the attitudinal effects due to repetition. In the advertising reception environment, it may be helpful to determine more specifically what constitutes relevant and irrelevant elaborations, that is, a classification of cognitive elaborations which highlights the specific content of the elaborative processing. A review of literature (Belch 1982; Lutz and MacKenzie 1982; Wright 1973) and a perusal of cognitive responses obtained from other commercial testing suggest the content topics of ad- and product-related responses. To explore the appropriateness of the "topic relevancy" explanation we hypothesize that

\[ H_0: \text{The frequency of positive (negative) "topic-relevant"} \]
considered "irrelevant." The recent work by Mitchell and Cacioppo and Petty. Ad-related elaborations may be considered the advertising context equivalents of the topic- and ad-related elaborations and brand attitude may be Mediating Role of Cognitive Elaborations

The content-based coding scheme allows for the study of whether excessive exposure generates repetition-related elaborations rather than influencing the more traditional, valence-based, counterargumentation and favorable message-related cognitive responses (i.e., "relevant" thoughts as suggested by Cacioppo and Petty). As a result, the mediating role of repetition-related responses can be assessed more precisely.

The content-based coding scheme also provides an improved basis for addressing the mediating effect of product- and ad-related elaborations on brand attitude. Product-related elaboration and brand attitude may be considered the advertising context equivalents of the topic-relevant elaboration and attitude designations used by Cacioppo and Petty. Ad-related elaborations may be considered "irrelevant." The recent work by Mitchell and Olson (1981) relates to this issue. They examined the relative contributions of attitude toward the ad (Aad), attitude toward the picture used in the ad (Aap), and a Fishbein cognitive structure index in predicting attitude toward the product (Aa) and attitude toward buying the product (Aabd). They observed that attitude toward the ad made a significant contribution to the prediction of Aa and Aad, beyond that provided by the cognitive structure index. They further observed that Aad had its major influence on Aa and Aad but not on purchase intent, which was determined primarily by Aad. These observations led them to conclude that product attribute beliefs may not be the only mediators of the variation in brand attitude produced by advertisements. For purposes of our study, the Mitchell and Olson effort suggests that both product- and ad-related elaborations are "relevant" and mediate attitude toward the new product. From these results we hypothesize that

H5: Indices of the net product-related elaborations as well as indices of net ad-related and repetition-related elaborations are significant predictors of receiver attitude toward the product and purchase intention. 

In summary, on the basis of a review of the literature in the areas of social psychology, marketing, and advertising, we advance a series of five hypotheses which in combination examine the appropriateness of the two-factor theory within an advertising context. The first four hypotheses propose three-way interaction effects due to repetition, knowledge, and commercial length. It should be noted that minimum support for the two-factor theory is to be found in the presence of repetition main effects. The more demanding, albeit exploratory, tests proposed involve the assessment of two- and three-way repetition interaction effects. If present and in meaningful direc-

Overview

A 2 x 2 x 3 between-subjects design was used with receiver knowledge (high or low), commercial version (30 or 90 seconds), and repetition (one, three, or five exposures) as the factors. Launch commercials for the Kodak Disc camera were made available prior to their national airing and served as test stimuli for the study. After exposure, measurements were taken on cognitive responses, attitudes, and recall.

Procedure

Undergraduate students were invited to participate in a study ostensibly designed to investigate mass communication, sports programming, and product usage. Four hundred and fifty screening questionnaires were administered to define a subject pool consisting of subjects with two different levels of knowledge about and experience with photographic equipment. Questions about camera equipment ownership and perceived knowledge were embedded in the screening questionnaire and served as subject selection criteria. High knowledge subjects were defined as those who owned and used at least one 35mm format camera and rated their knowledge about cameras as being very high or at an expert level. Low knowledge subjects were those who had no or only infrequent experience with Instamatic type cameras and who rated themselves as not at all knowledgeable about cameras (cf. Bettman and Park 1980). The application of these criteria resulted in the identification of 130 eligible participants.

Significant differences between the low and high knowledge groups were found in product ownership patterns and the number of rolls of black and white film (0.03 vs. 4.35), color prints (2.17 vs. 6.11), and slides (0.05 vs. 1.42) used in the last six months. The average dollar investment in photographic equipment was $48 for the low group and $395 for the high group. Thus, dramatic differences in experience with photography were observed between the high and low knowledge groups.

Subjects of the two knowledge conditions were assigned randomly to one of the six experimental treatments (two versions of the commercial by three levels of repetition). Upon arrival at the research setting small groups of subjects were read a set of instructions from a prepared script which presented the study guise and the required tasks. After listening to the instructions, subjects were shown a 40-minute television program, "The Games of the XXIst Olympiad," that included the experimental and other commercials during the regular commercial breaks. The test commercials were assigned to commercial breaks in such a way that spaced repetition rather than successive or massed repetition was accomplished.
Repetition was operationalized at three levels of commercial exposure (cf. Belch 1982; Cacioppo and Petty 1979, 1980; Gorn and Goldberg 1980). Two groups were exposed to one launch commercial inserted at the end of the program. Two additional groups viewed three exposures inserted at the beginning, middle, and end of the program. Two other groups viewed five exposures inserted in the natural commercial breaks at about equal intervals throughout the program. Thus, in each group the last commercial shown was the stimulus ad.

Immediately after the program subjects were asked to evaluate the program, complete a cognitive response task, and respond to dependent measures about attitudes and recall.

**Stimulus Ads**

To increase the mundane reality of the experiment, actual new product introduction ads were used as stimuli. Subjects were exposed to a never-before-shown, professionally produced television commercial that introduced a truly new product. As a result subjects were provided an opportunity to learn about a new product and a new commercial, and hence the effects of repetition on attitude formation could be assessed.

Two versions of the commercial were used. A 30-second and a 90-second version of the commercial featured similar audio content and organization but differed in the number of usage situation vignettes designed to dramatize the many uses and benefits of what Kodak termed its new “decision-free” photography. The difference in length therefore was due primarily to the number of product usage illustrations highlighting the product’s distinctive features. More important for purposes of our study, however, was the fact that the two versions afforded differential opportunity to elaborate on the message.

**Variables and Operationalizations**

The extent to which the test commercial created a memorable impression in relation to the competing commercials was assessed. Immediately after the program, respondents were asked to indicate which one commercial “stood out most in your mind.” After elicitation of cognitive responses, recall of the advertisement content was measured by asking subjects about the sales points presented in the ad and identified by Eastman Kodak as the communication objectives for both versions of the commercial. Specifically, subjects were asked to indicate which of 12 product attribute statements were made explicitly in the commercial. Only five of the 12 statements actually were made in the commercial. The number of correct sales points identified was used as the aided recall measure for the study.

To assess tedium, subjects were asked to rate their feelings toward “watching the Kodak Disc camera commercial again” on a series of three semantic differential scales having the same bipolar adjectives as were used in the other attitude measures (alpha = 0.97). In addition, a measure of the valence of repetition-related cognitive responses was viewed as a further indicant of tedium (Belch 1982).

**RESULTS**

**Learning**

Subjects’ perceived familiarity with the stimulus commercial and new product both were affected by exposure frequency ($F(2,118) = 24.56, p < 0.01; F(2,118) = 4.56, p < 0.05$, respectively). Also affected by repetition was recognition of the message arguments. The aided recall of sales points measure increased as levels of repetition increased ($M(1) = 2.73, M(3) = 3.19, M(5) = 3.61, F(2,118) = 5.62, p < 0.01$). Finally, as exposure frequency increased, the perceived distinctiveness of the test commercial in relation to the surrounding ads increased ($M(1) = .44, M(3) = .80, M(5) = .86; F(2,118) = 12.38, p < 0.01$). These findings replicate previous studies’ results and support the hypothesized repetition effect on receiver learning. However, this effect was not moderated by either commercial length or receiver knowledge.

**Tedium**

Tedium was defined as the subject’s feeling toward viewing the test commercial again. An analysis of variance reveals that the tedium scores differ significantly
one-, three-, and five-exposure conditions are reported by recipient knowledge and commercial length for the Attitude Criteria across levels of repetition. A repetition main effect ($F(2,118) = 5.21; p < 0.01$) is observed, indicating that subjects in the one-exposure condition had a more positive attitude toward seeing the commercial again than did subjects in the three- and five-exposure conditions. The mean attitudinal scores for the three conditions are 2.88, 3.78, and 4.10 respectively (1 = very good and 7 = very bad). The second indicator of tedium, the net valence index of repetition-related responses, also exhibits a significant main effect due to repetition ($F(2,118) = 13.22; p < 0.01$). This effect is due to differences in the number of negative repetition-related responses which show a repetition main effect ($F(2,118) = 13.17; p < 0.01$). The mean number of negative repetition-related responses increases dramatically from one to three exposures (0.00–0.95) and increases negligibly from the three to five exposures (0.95 to 0.96). No higher order interactions with knowledge and commercial length are significant. Hence, the hypothesized repetition effect on tedium is supported.

**Attitude Criteria**

The third hypothesis pertains to the effects of repetition on several measures of attitude and purchase intention. The mean scores on these measures categorized by recipient knowledge and commercial length for the one-, three-, and five-exposure conditions are reported in Table 1. Viewers across all conditions expressed a generally favorable evaluation of the new product and indicated a low probability of buying the product within the next 12 months. As can be observed in Table 2, viewers’ attitudes toward the product, ad, and company and their purchase intention were not affected by repetition or repetition-related interactions. These results do not provide evidence to support $H_3$ and the curvilinear relationship between frequency of exposure and relevant attitude criteria for a new product. One possible explanation for the results is the existence of distinct and different curvilinear relationships for the different treatment combinations which when aggregated do not produce a curvilinear main effect due to repetition. This explanation seems to be supported by an ad length by repetition interaction for purchase intention which approaches significance ($F(2,118) = 2.43; p = 0.09$). As shown in Figure 2, the shorter version of the commercial produced more favorable purchase intentions for both knowledge groups as the frequency of exposure increased. The increased opportunity to elaborate provided by repetition appears to have enhanced receivers’ feelings toward the product. Repeated exposure to the longer version of the commercial had a different effect. For both knowledge levels, the 90-second commercial tended to produce more “kinked” profiles reflecting a decrease in purchase intention as exposure frequency increased from three to five exposures. These trends are interesting and meaningful in terms of the two-factor perspective. They suggest that increases in the opportunity to elaborate, up to moderate levels, may indeed enhance the persuasiveness of television commercials. At excessive levels of opportunity, however, the persuasiveness of the advertisement declines.

Though the ad length by repetition interaction for purchase intention is interesting and meaningful, similar interaction patterns are not observed for the other attitude criteria in the study and hence the overall conclusion must be that $H_3$ is not supported.

**Cognitive Elaborations**

The cognitive elaboration perspective suggests that “content-relevant” elaborations show differential patterns across exposure frequencies. Following the conceptualization of “content-relevant” elaborations used by

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Table 1

<table>
<thead>
<tr>
<th></th>
<th>One exposure</th>
<th>Three exposures</th>
<th>Five exposures</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low know</td>
<td>High know</td>
<td>Low know</td>
</tr>
<tr>
<td>30-second commercial</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitude toward product</td>
<td>5.27</td>
<td>5.05</td>
<td>5.37</td>
</tr>
<tr>
<td>Intention to purchase</td>
<td>1.75</td>
<td>1.50</td>
<td>2.40</td>
</tr>
<tr>
<td>Attitude toward ad</td>
<td>4.03</td>
<td>5.00</td>
<td>5.07</td>
</tr>
<tr>
<td>Attitude toward company</td>
<td>6.03</td>
<td>6.41</td>
<td>5.20</td>
</tr>
<tr>
<td>90-second commercial</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitude toward product</td>
<td>5.48</td>
<td>5.84</td>
<td>6.30</td>
</tr>
<tr>
<td>Intention to purchase</td>
<td>2.64</td>
<td>2.23</td>
<td>2.65</td>
</tr>
<tr>
<td>Attitude toward ad</td>
<td>5.61</td>
<td>4.94</td>
<td>5.73</td>
</tr>
<tr>
<td>Attitude toward company</td>
<td>5.82</td>
<td>5.91</td>
<td>5.83</td>
</tr>
</tbody>
</table>

*Attitude scale values: 1-unfavorable, 7-favorable.

*Purchase intent values: 1-disagree, 7-agree.

---

The intercorrelations among attitude toward the product ($X_1$), attitude toward the ad ($X_2$), attitude toward the company ($X_3$), and purchase intention ($X_4$) are $r_{12} = 0.49$, $r_{13} = 0.32$, $r_{14} = 0.44$, $r_{23} = 0.28$, $r_{24} = 0.39$, and $r_{34} = 0.22$. 
Table 2
ANALYSES OF VARIANCE FOR ATTITUDE MEASURES

<table>
<thead>
<tr>
<th>Source</th>
<th>d.f.</th>
<th>$A_k$</th>
<th>SS</th>
<th>F</th>
<th>$P_l$</th>
<th>SS</th>
<th>F</th>
<th>$A_{ad}$</th>
<th>SS</th>
<th>F</th>
<th>$A_{company}$</th>
<th>SS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge ($K$)</td>
<td>1</td>
<td>1.88</td>
<td>1.88</td>
<td>0.92</td>
<td>0.17</td>
<td>0.06</td>
<td>0.44</td>
<td>0.24</td>
<td>5.55</td>
<td>5.17*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Repetition ($R$)</td>
<td>2</td>
<td>0.99</td>
<td>0.88</td>
<td>0.48</td>
<td>5.65</td>
<td>1.02</td>
<td>6.35</td>
<td>1.73</td>
<td>0.49</td>
<td>0.23</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ad length ($L$)</td>
<td>1</td>
<td>0.98</td>
<td>1.83</td>
<td>0.69</td>
<td>4.29</td>
<td>1.54</td>
<td>1.78</td>
<td>0.97</td>
<td>1.95</td>
<td>1.82</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$K \times R$</td>
<td>2</td>
<td>1.63</td>
<td>1.63</td>
<td>0.40</td>
<td>1.08</td>
<td>0.19</td>
<td>0.06</td>
<td>0.02</td>
<td>2.54</td>
<td>1.18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$K \times L$</td>
<td>1</td>
<td>1.49</td>
<td>1.49</td>
<td>0.73</td>
<td>3.26</td>
<td>1.17</td>
<td>8.38</td>
<td>4.56*</td>
<td>4.83</td>
<td>4.30*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R \times L$</td>
<td>2</td>
<td>2.83</td>
<td>2.83</td>
<td>0.69</td>
<td>13.51</td>
<td>2.43</td>
<td>5.44</td>
<td>1.48</td>
<td>0.82</td>
<td>0.39</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$K \times R \times L$</td>
<td>1</td>
<td>5.33</td>
<td>5.33</td>
<td>1.30</td>
<td>2.68</td>
<td>0.48</td>
<td>1.89</td>
<td>0.52</td>
<td>1.37</td>
<td>0.64</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < 0.05.

Cacioppo and Petty (1980), we initially categorized subjects' elaborations as either positively valenced, negatively valenced, or neutral. A total of 839 thoughts, or an average of 6.45 thoughts per subject, were categorized. Forty-seven percent of these thoughts carried positive valences and 35% were negative. Analyses of variance performed on the frequencies of positive, negative, and neutral responses show no main effects due to repetition, knowledgeability, or ad length. The higher order interactions do not approach significance nor do they suggest meaningful patterns of cell means similar to the purchase intention patterns discussed before.

A further examination of the distribution of elaboration responses using the content-based coding scheme provided insight into what constitutes "topic relevancy" in an advertising context. Product-related responses account for 40.4% of all elaborations generated, whereas ad-related thoughts constitute 47.3% of all thoughts. Of the total number of ad-related thoughts, 25% are repetition-related. Interestingly, curiosity statements, primarily about the new product, account for 17% of the total number of elaborations. These data suggest that within an advertising context the major "topic-relevant" elaborations include responses related to product, ad, repetition, and product curiosity.

To assess how these more specific content elaborations may have been influenced by the experimental treatments, we performed several analyses of variance. First, an ANOVA on the net valence index for product-related elaborations (i.e., the number of positive less the number of negative product-related responses) did not exhibit any treatment effects. A significant length main effect was observed, however, for the number of product-related curiosity responses ($F(1,118) = 4.49, p < 0.05$).

Figure 2
PURCHASE INTENTION BY FREQUENCY OF EXPOSURE, RECEIVER KNOWLEDGE, AND COMMERCIAL LENGTH
0.05). The 30-second version of the commercial produced many more curiosity thoughts than did the 90-second version. The 90-second version showed a larger number of usage vignettes dramatizing the uses and benefits of the new camera. This increased information transmission most likely accounts for the decrease in curiosity statements as a larger number of recipient questions may have been answered.

Second, the net valence index for ad-related responses, exclusive of repetition-related responses, showed a knowledge by repetition by length three-way interaction \((F(2,118) = 3.59; p < 0.05)\). As can be observed in Figure 3, the ad-related responses for the low knowledge subjects became more positive as exposure frequency increased, with the rate of increase greater for the longer ad version. As the opportunity to elaborate increased, ad-related elaboration appears to have become more positive. For the high knowledge viewers, in contrast, it was the shorter version of the commercial which resulted in more positive ad-related responses as exposure increased. The longer version induced an inverted-U pattern with the net valence becoming negative for the highest level of exposure. That is, for the high knowledge group under conditions of highest elaboration opportunity the ad-related elaboration became negative. Thus, the pattern of elaborations with respect to the commercial is meaningful and consistent with the two-factor perspective.

### Mediating Role of Elaborations

To explore the potential mediating role of the content-specific elaborations on the various attitudes, several stepwise regressions similar to the Mitchell and Olson (1981) analyses were performed. Net product-related, ad-related, repetition-related indices were used as predictors of attitude toward the product \((A_p)\), purchase intention \((PI)\), and attitude toward the ad \((A_a)\).

Net product-related elaborations are found to be the primary predictors of both \(A_p\) and \(PI\) (Table 3). Also ad-related elaborations contribute significantly to the prediction of receivers’ attitude toward the product beyond that explained by product-related elaboration. However, they do not contribute to the prediction of purchase intent. These findings replicate Mitchell and Olson’s results and suggest that though ad-related responses may transfer to receivers’ attitudes toward the product they...
Table 3
REGRESSION MODELS PREDICTING PRODUCT AND AD CRITERION VARIABLES (beta coefficients and F-values)

<table>
<thead>
<tr>
<th>Criterion variable</th>
<th>Step</th>
<th>Net product index</th>
<th>Net ad index</th>
<th>Net repetition index</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Att product (Aₜ)</td>
<td>1</td>
<td>0.37027</td>
<td>(20.34)</td>
<td>0.34461</td>
<td>(19.54)</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>0.34461</td>
<td>(19.59)</td>
<td>0.31493</td>
<td>(16.27)</td>
</tr>
<tr>
<td>Purchase intention (PI)</td>
<td>1</td>
<td>0.36566</td>
<td>(19.76)</td>
<td>0.31493</td>
<td>(16.27)</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>0.35538</td>
<td>(18.37)</td>
<td>0.12576</td>
<td>(2.35)*</td>
</tr>
<tr>
<td>Att ad (Aₐ)</td>
<td>1</td>
<td>0.19453</td>
<td>(7.31)</td>
<td>0.55609</td>
<td>(57.30)</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>0.19453</td>
<td>(7.31)</td>
<td>0.54021</td>
<td>(56.36)</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>0.19060</td>
<td>(6.92)</td>
<td>0.53932</td>
<td>(55.87)</td>
</tr>
</tbody>
</table>

*Not significant at < 0.01.

are not a substantial determinant of purchase intention. Last, the regression analyses show that repetition-related elaborations do not contribute to an explanation of the variation in Aₜ and PI beyond that accounted for by the product- and ad-related thoughts. Thus, H₅ which proposes a mediating role for repetition-related elaboration, is rejected.

The predictors of attitude toward the ad also were examined. As might be expected, ad-related elaborations are the major determinants of Aₐ. Product-related responses do have a statistically significant role, but the size of the contribution must, for all practical purposes, be considered minimal. Repetition-related elaborations did not bias the formation of attitude toward the ad.

CONCLUSIONS

Discussion

Two general objectives guided our research. The first was to investigate whether the positive learning and negative tedium processes presumed by the two-factor theory to underlie message repetition effects appropriately describe viewers' responses to repeated exposure to a new-product television commercial. The second was to explore whether additional manipulations of elaboration opportunity due to receiver knowledge and commercial length would moderate attitude formation.

In terms of the first general objective, the results suggest that repeated exposures increase viewers' familiarity with both the new product and the commercial. Recall of ad content also increases with frequency of exposure. Overall, these findings are consistent with the hypothesized behavior of the first factor in the two-factor theory. Increased exposure to a stimulus allows the receiver to experience greater learning, overcome uncertainties about the stimulus, and form a reaction to it.

Direct evidence also is obtained for the hypothesized development of a tedium/reactance response to repeated exposure to the commercial. The frequency of negative repetition-related elaboration increased with increases in repetition, and viewers' attitude toward watching the commercial again became more negative as exposure frequency increased. Thus, support is found for the operation of the second factor of the two-factor theory.

Strong support is not found for the hypothesized curvilinear relationship between exposure frequency and attitude formation toward the novel product and commercial. The repetition effect on attitudes was not observed, even though the experiment's level of statistical power to detect effects at a Type I error rate of 5% is comparable to that of earlier experiments (Cohen 1977; Sawyer and Ball 1981). Two-factor theory postulates this relationship to be the net result of the two opposing factors. In our study, however, the two factors are found not to be additive. Though an increase in learning was observed across moderate levels of repetition, the increase in learning did not in turn increase affect. Thus, stimulus learning is not necessarily related to affective reactions. At higher levels of repetition the development of tedium was observed but this tedium did not bias att-

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*The mean statistical power of the experiment to detect f = 0.10, f = 0.25, and f = 0.40 at alpha of 0.05 (0.10) is 0.17 (0.27), 0.73 (0.82), and 0.99 (> 0.99), respectively (Cohen 1977).
U hypotheses for describing new product advertising repetition effects. Theoretical accounts of repetition effects observed in massed or successive exposures to novel nonsense stimuli and counterattitudinal messages appear not to be robust frameworks for describing television audience's responses to repeated commercial exposures. Clearly more research is needed to assess this position and determine whether the two-factor perspective is indeed potentially useful (cf. Sawyer 1981).

Limitations

Though the use of professionally prepared, novel television commercials in our study represents an improvement in mundane reality over previous studies, several limitations must be mentioned. First, the highest exposure level used in the study may be considered excessive for a less than one hour program. Indeed, for established products such exposure patterns are likely to be uncommon. For new product launching campaigns, however, such levels may not be totally inconsistent with viewers' exposure experience during a television viewing session.

A second concern is related to the 90-second version of the launching ad. Though this commercial actually was used to introduce the Kodak Disc camera and the greater-than-usual ad length may be particularly effective in the introduction of new products, the 90-second commercial length is not the industry standard. Therefore any generalizations about the effects of commercial length must be undertaken with care.

A final aspect of the study which may be explored further in future research is the effects of the commercial reception environment on immediate cognitive elaborations. The small-group laboratory reception environment in which our subjects operated is not identical to the home viewing environment and may have enhanced receivers' processing motivation and opportunity. In a home TV-viewing environment factors may be operating which restrict cognitive elaborations and responses (cf. Wright 1981).

Further Research

One issue explored in our study involved the explicit measurement of viewers' tedium/reactance created by repeated exposure to the same television commercial. We found that tedium did not bias product-related elaborations, product attitude, and purchase intention. Assessment of viewer's attributions about the causes and implications of their tedium/reactance responses therefore is needed, particularly given the crucial role of tedium in the two-factor models.

The issue of what constitutes appropriate affect criteria in an advertising context appears to be an important one. Past advertising studies used measures of attitude toward the product and purchase intention, which on the surface appear to be logical extensions of the criteria employed in the social psychological studies. In our study these measures plus measures of attitude toward the ad and manufacturer were used because viewers are likely...
to distinguish among product-related feelings and feelings toward the ad and toward the manufacturer. Indeed, the results of the study suggest that these criteria behave rather independently and do not share the same treatment effects. It remains to be explored in future studies whether the formation of these separate attitudes is based on similar underlying processes. Additional information on this issue would provide insight on the question of when and how ad-related responses and attitudes affect brand choice (cf. Shimp 1981).

A third issue is the need for a cognitive response coding scheme which would be appropriate for an advertising context. We found that an extended coding scheme could be used to assess the role of repetition and ad-related elaborations in affecting product attitude. Future research might consider more complex and/or more refined coding schemes to explore further whether viewers’ elaboration becomes biased or changes across exposure frequency (cf. Krugman 1972).

A final, related issue is the mediating role of receiver’s elaborations. In our study regression analyses using the content-based elaborations indicate that these responses were significant predictors of the appropriate attitude measures. It is important to note, however, that the frequencies of these specific content responses did not indicate treatment effects parallel to the effects observed in the respective attitude criteria. Though this finding is similar to those in other advertising studies (e.g., Calder and Stemthal 1980), it suggests that the issue of whether or not cognitive responses are attitude-content-specific mediators remains important and remains to be resolved.

REFERENCES
——— and S. Ward (1979), “Carry-Over Effects in Adver-

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