Situational Effects of Advertising Repetition: The Moderating Influence of Motivation, Ability, and Opportunity to Respond

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It is argued theoretically that the attitudinal gain from advertising repetition should continue to increase rather than level off when consumers fail to generate cognitive responses to message arguments in earlier exposures. An experiment shows that repetition continues to increase brand attitudes and purchase intentions in conditions where support and counter argument production is expected to be low, but that these attitudinal gains level off under conditions in which a high level of such production is expected.

The effects of message repetition on attitudes and purchase intentions have been studied often (see Sawyer 1974 and Belch 1982 for reviews). Most studies show that messages gain in impact for a few exposures but that further exposures begin to have a negative effect. Such inverted-U curves for repetition impact emerge, for example, in the literatures on the attitudinal impact of mere exposure (Harrison 1977; Sawyer 1981; Zajone 1968) and on advertising wearout (Calder and Sternthal 1980).

Common to both the wearout and mere exposure literature is the process view that while increasing exposure initially enhances learning and favorable attitudinal affect, subsequent exposures—past the point of "over-learning"—create tedium and negative affect (Berlyne 1970; Stang 1975). Further, Cacioppo and Petty (1979) use the cognitive response paradigm (Greenwald 1968; Wright 1973) to show that production of support arguments increases, then decreases with exposure, while production of counter arguments decreases, then increases with exposure; as a result, agreement with the message (the attitudinal outcome studied) increases, then decreases with higher exposure. Similarly, Calder and Sternthal (1980) explain repetition results in terms of the relative production of message-related versus "own" thoughts on repeated exposure, with "own" thoughts—assumed to be less positive than message-related thoughts—forming an increasing proportion of total thoughts with increasing exposure.

These studies and theoretical perspectives would suggest that, in general, intermediate levels of message exposure (two or three) should provide higher message effects than either very low or very high levels. This expectation finds support in studies of advertising repetition on eye movement responses (Krugman 1968), attention (Grass and Wallace 1969), and brand attitudes (Gorn and Goldberg 1980; Naples 1979; Ray, Sawyer, and Strong 1971; Winter 1973).

In this paper, we extend the results of such prior research by examining variations in attitudinal (and purchase intention) gains from advertising repetition across situations that vary in the antecedent conditions required for advertisements to generate cognitive responses. Such antecedent conditions include the message recipient's motivation, ability, and opportunity to generate support arguments and counter arguments to the message. Evidence exists that the point at which advertising repetition begins to create an attitudinal downturn is moderated by various product, brand, user, execution, and media factors (Naples 1979; Ray et al. 1971; Silk and Vavra 1974). Though theoretical frameworks exist to explain why the effects of repetition are,

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in general, curvilinear (e.g., Sawyer 1981), such situational differences in where the downturn begins deserve further research.

In this article, a theoretical framework is developed both to explain previous research results indicating such situational differences and to make further predictions about the differential gains from repetition for different kinds of advertisements. In particular, hypotheses are developed about the differential gain from repetition for ads classified as being high or low on the levels of support and counter argumentation expected on exposure. These hypotheses about differential repetition effects are then tested experimentally.

THEORETICAL FRAMEWORK

Our “situational effects” framework builds on Cacioppo and Petty’s (1979) cognitive response explanation of repetition effects. Cacioppo and Petty showed that the typical pattern of attitudinal effects of message repetition (an inverted-U curve) could be explained by the differential production of support arguments and counter arguments at different levels of message repetition. Several aspects of this process mechanism deserve attention. As the authors point out, the mechanism indicates that (1979, p. 105):

the repetition of the message arguments provided more opportunities to elaborate cognitively upon them (sic) and to realize their cogency and favorable implications. Hence, counterargumentation declined at the moderate exposure frequency. At high exposure levels, however, tedium and/or reactance may have motivated the individual to again attack the now offensive communication. Thus, counterargumentation was renewed, and agreement decreased at high exposure levels.

In other words, high exposure messages, having already been thought about, become offensive. Such message-related thinking would involve the generation of the support and counter arguments studied by Petty and Cacioppo.

Two implications follow from this explanation. First, if the point at which the message is thought about is delayed, the point at which it becomes offensive should also be delayed, and the curve of dependent attitudes should continue to rise rather than fall to the familiar inverted-U shape. Second, the point at which the message is thought about is a function of the antecedent conditions for support argument and counter argument production in that situation. If the antecedent conditions are at low levels, such message-related thinking would not occur extensively in the first few exposures, the message would not become offensive until later, and the point of the attitudinal downturn would be delayed. Repetition would thus continue to increase attitudes. In contrast, when the antecedent conditions create high levels of support argument and counter argument production at low levels of exposure, the attitudinal downturn will occur earlier. In the latter situation, further repetition will yield no further attitudinal gain; attitudes may, in fact, decline with further repetition.1

Antecedents of Cognitive Response Production

It is well known that the antecedent conditions for such support argument and counter argument production are (1) the motivation, (2) the ability, and (3) the opportunity to respond to message arguments. The motivational antecedent—the feeling on the part of the message recipient that the content of the message is important to them—is usually labelled “involvement,” and is the antecedent most commonly studied (Chaiken 1980; Roberts and Maccoby 1973; Wright 1973; see also Wright 1980). As shown by Petty and Cacioppo (1979), high levels of such motivation increase the production of support arguments and counter arguments.

The ability antecedent is discussed by Roberts and Maccoby (1973), who show that increased respondent knowledge about the issue leads to increased cognitive response production to a message (cf., the inoculation research of McGuire 1964). Note that such ability, as usually defined in such research, depends on the issue in question, and is not treated here as an individual trait. In the advertising context, such response-enabling knowledge could come from generalized knowledge about the product category, the brand in the ad, or even from high prior familiarity with that specific advertising execution. While the relationship is usually thought of as linear, it is possible that very high levels of prior knowledge might lead to reduced, rather than greater, levels of response to message arguments (cf., Johnson and Russo 1984).

As pointed out by Petty, Cacioppo, and Goldman (1981, p. 853), the motivation and ability antecedents, though theoretically distinct, are usually highly correlated in practice, since those motivated to find out more about an issue are likely to develop greater expertise than are those who are less motivated (cf., Markus 1977, who found that people have a greater ability to think about those things relevant to their “self”). In an advertising context, Lutz, MacKenzie, and Belch (1983, p. 534) report that respondents high in motivation were also high in knowledge. Thus, while these two antecedents should be manipulated independently where possible (or motivation should be varied with ability kept

1A similar model has recently been suggested by Cacioppo and Petty (1985).

2It could be argued that individual trait-like differences in inherent processing ability also ought to be considered. While the argument has merit, such individual differences are usually ignored in the cognitive response paradigm (for exceptions see Wright 1975 and Cacioppo and Petty 1982). For an exhaustive review, see Wright 1980.
constant, as in Petty and Cacioppo (1983), such orthogonal manipulations are often difficult in some settings. The effects of the third antecedent—response opportunity—are shown most clearly in the literature on distraction effects (cf., Festinger and Maccoby 1964; Osterhouse and Brock 1970), where high levels of distraction (implying low opportunity) reduce the support and counter argumentation evoked by a message. Additionally, Krugman (1967) and Wright (1981) have argued that television, unlike print, is a low “opportunity” medium since the message pace is higher and the respondent control over exposure is lower. Wright (1981, p. 276) has shown that, as a consequence, print messages usually evoke more cognitive response production than TV messages. From a different perspective, Calder, Insko, and Yandell (1974), Chaiken (1980), and Petty and Cacioppo (1984, p. 76) have shown that when messages themselves contain more arguments, the number of support and counter arguments is higher than when the messages contain fewer arguments. The presence of more arguments within the message thus provides more “opportunity” to the respondent for support and counter argumentation: all other things being equal, a recipient should be able to generate a greater number of such responses to a message that contains more arguments than to one that contains fewer.

These antecedents are discussed further in Wright (1974, 1975, 1980, 1981) and Roberts and Maccoby (1973). While these antecedents do interact, the nature of the interactions is not fully understood. Wright shows, for instance, that while motivational differences impact on support argument production only if the opportunity to do so is already high (as in the print medium; 1974, 1981), counter argument production does not show this interaction. Petty and Cacioppo (1984) show that the existence of more arguments within a message serves as an attitude-increasing “peripheral cue” under low motivation conditions, regardless of their quality, but increases attitudes under high motivation conditions only if the arguments’ “cogency” is high. Clearly, therefore, three-way interactions are of interest, but no comprehensive theory of such interactions yet exists.

Situational Implications

Combined with the process view on repetition presented earlier, the literature on the three antecedents of cognitive response production suggests that repetition of a message will lead to increases in brand attitudes only if these antecedents are at low levels. Such a situational framework is supported by and helps organize results reported in much previous research on repetition. Thus, Ray et al. (1971) reported that repetition continued to increase intention to buy in ads for low-price “convenience” goods, but not for high-price “shopping” goods, and for soft-sell “non-grabber” ads, but not for hard-sell “grabber” ads—a result also reported by Silk and Vavra (1974). Rothschild and Ray (1974) found that while political advertising for a state assembly race did lead to an increase in voting intentions as a function of repetition, advertising for a presidential race did not. These results support the situational framework suggested because more motivated message processing can be expected for shopping goods, grabber ads, and presidential elections. Similarly, the reason that Belch (1982) found no significant effects of repetition using TV commercials may be that respondents were told before exposure that they would be asked questions about the commercials, thus increasing the motivation to generate message-related thoughts.

Next, since high ability (from greater knowledge and prior familiarity) should enable more message-related initial processing, this should reduce the positive attitudinal effects of further repetition. Supporting this expectation, Calder and Sternthal (1980) report that higher exposure led to more total (both positive and negative) thoughts for an unfamiliar product, but to an increase (for high exposure levels) only in negative thoughts for a well-known product.

Finally, since Krugman (1967) and Wright (1974, 1981) have argued that print, unlike TV, is a medium that allows greater opportunity for attribute-based response, the framework developed would suggest that the attitudinal downturn should occur earlier in print than in TV. Mitchell and Olson (1977) did find that repetition of two kinds of print ads did not have a positive effect on belief strength, attitudes, or purchase intentions, while most studies using TV ads have found positive repetition effects. Thus, there seems to be substantial prior research suggesting that the antecedents of such support argument and counter argument production should moderate the attitudinal effects of message repetition, with continuing attitude gains in situations wherein such message-related thinking is reduced.

Some writers have combined the “ability” and “opportunity” variables (e.g., Petty 1981), including the effects of distraction under “ability.” Some others, however (e.g., Wright 1980), use “opportunity” as another antecedent, using it to understand the effects on cognitive response production of low respondent control over exposure time, message length, the number of arguments in the message (as in Calder et al. 1974), distractor thoughts evoked by competing messages (as in Wright 1981), etc. Cacioppo and Petty (1979) conceptualize repetition as providing “opportunities” for message response. While “opportunity” could, therefore, be subsumed under “ability,” we prefer to keep them distinct, including under “opportunity” those response-enabling variables not under the respondent’s own control (e.g., the number of message arguments), and including under “ability” those that are so controllable (e.g., generalized product knowledge).

Other studies, however, suggest that minimal familiarity is necessary for any repetition impact: Ray et al. (1971) found that while well-known brands have positive repetition functions, brands that are not well known have flat repetition functions for at least eight exposures.
HYPOTHESES

H1: Repetition will lead to continuing gains (increases over control) in purchase intentions and attitudes for ads evoking a low number of (claimed) brand thoughts (support arguments and counter arguments) in early (first or second) exposures, but not for ads evoking many such thoughts.

The following sections will describe how the antecedent variables of support argument and counter argument production were operationalized in this study. In terms of manipulations, the motivation and ability antecedents—which are expected to be highly correlated (as described earlier)—were combined as one factor, and opportunity was treated as the other variable of interest. While it would have been preferable to keep them distinct, pilot testing (see Batra 1984) showed that a manipulation of motivation through the product category of the advertised brand also varied the ability antecedent, since respondents knew more about those product categories they cared more about. Hypothesis 1, which relates to the effects of support and counter argumentation on repetition responses, is thus extended to these antecedent factors individually. Specifically:

H2: Repetition will lead to continuing gains in brand purchase intentions and attitudes for ads low in antecedent motivation/ability, but not for ads high in such antecedent motivation/ability.

H3: Repetition will lead to continuing gains in brand purchase intentions and attitudes for ads low in antecedent opportunity, but not for ads high in such antecedent opportunity.

As will be explained later, the opportunity manipulations were conducted in terms of the execution styles of the stimulus ads, with ads containing more attribute arguments providing greater opportunity for support and counter argumentation. Notice that no interactions are posited between the motivation/ability antecedent and the opportunity antecedent in their responses to different exposure levels. This is because of recent research suggesting that the number of message arguments (the opportunity antecedent here) acts to raise attitudes under conditions of both high and low motivation/ability, although through different “routes.” Petty and Cacioppo have recently shown (1984, p. 78) that as long as the messages are “cogent” (strong rather than weak), the presence of more arguments in the message increases attitudes either by increased support argument production (in high motivation/ability situations) or by acting as a peripheral cue facilitating attitude change (in low motivation/ability conditions). We thus do not expect any three-way (repetition × motivation/ability × opportunity) interactions, though the interactions of repetition with the opportunity variable may occur through different mechanisms in the two motivation/ability conditions: cognitive response production in the high motivation/ability level, and the just-described peripheral route in the low motivation/ability level.

Finally, though data were also collected on measures of brand salience (recall and familiarity), repetition effects on attitudes and purchase intentions via cognitive response mechanisms are expected to be unrelated to effects on measures of salience (cf., Cacioppo and Petty 1979, pp. 103–104, who found no interactions with frequency on recall measures, and very low correlations of recall with cognitive response production). Thus we do not hypothesize any interactions of repetition with these salience measures.

METHOD

In this study, 131 housewives were exposed to three 30-second TV test commercials each in a design that varied product category and brand usage (manipulation of antecedent motivation/ability), ad execution (manipulation of antecedent opportunity), and frequency level. The ads were embedded in program context with an appropriate cover story, and the exposures were distributed over two sessions, one week apart. The gains over an internal, zero-exposure control group were analyzed for brand purchase intentions, attitudes, and familiarity; differences in ad recall were also studied.

Design

The objective of the study was to study differences in repetition effects across different levels of the antecedents of support/counter argument production: the motivation, ability, and opportunity to respond to the ad in such attribute fashion. However, as mentioned earlier, the motivation and ability antecedents are expected to be correlated, since high motivation to make careful brand choices would lead respondents to increase their knowledge about how such better choices could be made. Thus, in this study both were treated as one antecedent variable. The design used was a $2 \times 2 \times 3$ factorial, with the first two factors (between subjects) being antecedent motivation/ability (high, low) and antecedent opportunity (high, low). The third factor was a within-subjects frequency treatment, with each respondent seeing each ad (a 30-second TV commercial) either one, two, or four times. (As a consequence of the scheduling patterns to be described later, the repetition treatment in this experiment is necessarily confounded with some scheduling operationalizations used; see section on scheduling.) The choice of a within-subjects treatment for frequency was made primarily on statistical grounds: it would control for individual differences and thus increase the power of the test.
Table 1 presents the design. To increase generality, and to make possible the administration of ads at different test frequencies to the same individual, the three repetition levels within each between-subjects cell each used three different replicates of the ad type representing the between-subjects treatment of that cell (e.g., high motivation/ability product category, low opportunity execution). A subject would thus see three test ads representing her between-subjects treatment: the first would be seen once, the second twice, the third four times. To avoid confounding a frequency level with a particular ad (replicate), these ads were partially counterbalanced across frequency levels using a latin square design (making the total design a split plot). Each between-subjects cell thus had three replicate-frequency groups, with an average of 12 respondents per group (before no-shows and dropouts; actual n's are slightly lower). Each of the three within-cell replicate-frequency groups was run in two separate subgroups of six respondents each to avoid intergroup history confounds (see also Footnote 6). The sessions were balanced across day of week and time of day.

In addition to providing data on the three test ads in their treatment, respondents also provided data on the three brands used in the experiment that did not appear in their cell, thus providing a control (zero exposure) condition for the analysis of treatment effects through gain scores. Since these were real ads for real brands, with differing pre-exposure attitude and intentions scores, a "pre-post" rather than "post-only" dependent variable is clearly appropriate. However, a pre-exposure measurement could be reactive, and so this "internal control" strategy was employed for the computation of gain scores.

Stimuli

Antecedent motivation/ability was first manipulated through the choice of the product category in the ad, and selection was made on the basis of data collected from another study not described here (Batra and Ray 1985) that measured the extent to which respondents rated the category as one in which brand choices mattered to them (motivation) and the extent to which they considered themselves knowledgeable about that category through usage or otherwise (ability). As expected, such antecedent motivation and ability were significantly correlated in the earlier study \(r = 0.49, \rho < 0.01, n = 480\). Three different brands, representing three different product categories, were used as replicates within each of the two (high/low) motivation/ability treatments. For high motivation/ability the product categories were photographic film, deodorants, and facial moisturizers; for low motivation/ability, the categories were instant coffee, instant chocolate drink mixes, and frozen pizzas. For reasons of confidentiality, brand names cannot be disclosed. Thus, six different brands (product categories) were used in all. Data from the pilot study showed the selected stimuli differing significantly across both the motivation and ability measures. To further add to the potency of this "ability" manipulation, the specific brands chosen for the high motivation/ability treatments were market leaders, implying a high probability that the respondents would have used them before and thus have high usage-based knowledge about them; those brands chosen for the low levels were not market leaders. Pilot study data showed such differences for prior usage for the selected brands to be directionally as desired. These data also showed that while higher usage brands had higher pre-exposure attitudes \(r = 0.50, \rho < 0.01\), such higher usage did not appear to raise total support and counter argument production by itself \(r = 0.03, \text{n.s.}\). (The possibility of usage differences confounding results is discussed later.)

Antecedent opportunity was manipulated through the choice of the execution of the ad, with a "many attribute arguments" execution considered high in antecedent opportunity, and "few attribute arguments" executions considered low in such opportunity. The presence of more attribute statements within the ad provides greater opportunity for the viewer to generate support arguments and counter arguments (cf., the results of Chaiken 1980 and Petty and Cacioppo 1984).

The ads were categorized based on pilot data (Batra 1984, p. 383) on how much attribute information was perceived to be in them: the mean informativeness rating was 2.79 for low opportunity and 3.88 for high opportunity \(\rho < 0.01, n = 142\). Results from this pilot study confirmed that ads rated as more informative generated significantly more total support and counter

### Table 1

**Experimental Design for Repetition Study**

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<th>Motivation/Ability</th>
<th>High (many arguments)</th>
<th>Low (few arguments)</th>
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*Between-subjects: Antecedent motivation/ability (2 levels) × Antecedent opportunity (2 levels).

*Within-subjects: Frequency of exposure.

*To be read: High motivation/ability, many arguments, replicate ad execution #1.

*To be read: High motivation/ability, few arguments, replicate ad execution #1.

**NOTE:** The experimental design had two between-subjects factors at two levels each (motivation/ability and opportunity) and one within-subjects factor at three levels (frequency of exposure). Each between-subjects cell in this design had three "replicate groups," using latin square counterbalancing. Data for each of these replicate groups was collected in two sessions, from equal subgroups.
arguments \( (p < 0.01) \), though the absolute magnitude of this correlation was low \( (r = 0.13) \). Such low correlations should be expected because for these real ads on real brands, such cognitive responses are the outcomes of message content interacting with prior attitudes and knowledge structures, and are thus dependent on much more than just how many arguments there were in the ad.) The executions used across the two opportunity levels were pairs for the same brand, so that “number of arguments” execution differences were not confounded with differences in brands. However, the pilot testing did reveal that real ads having few arguments also tended to be more “affective” in their execution, thus having a greater “emotional impact” (mean emotional rating for low opportunity ads = 4.17 and for high opportunity ads = 2.22, \( p < 0.01 \)). To help correct against such confounding, data were also collected in the study on emotional impact and liking for the ad for possible use as covariates.

### Scheduling

As mentioned earlier, the test ads (embedded in program content) were distributed over two different sessions, one week apart. The across-program and within-program scheduling operationalizations are presented in Table 2. It should be noted that (1) within each relevant commercial string, the test ads were given first position to both equalize position string effects and to create stronger manipulation effects for the test ads, (2) the one-exposure ad was always shown in the first week, while the two- and four-exposure conditions were evenly divided between the two weeks, (3) the two exposures within each weekly program for the four-exposure condition are at least one commercial string apart, and (4) the positions of the four-exposure and two-exposure ads across the last two strings are counterbalanced across the two sessions.

The interval between last exposure and effect measurement is thus under 30 minutes for the two- and four-exposure conditions and is one week for the one-exposure condition. The result of the frequency/time-of-measurement confound built into this scheduling choice is that the two- and four-exposure levels of dependent measures could exceed the one-exposure levels either because of higher frequency or because they were closer to the time of measurement. This confound would not, however, explain away differences among the two- and four-exposure conditions themselves (which is where the downturn in dependent measures is expected) or differences across cells in the location of the downturn, since the time-of-measurement confound would apply equally to all cells. Further, in the analysis to follow, any interactions significant in the total design were also tested for significance in the unconfounded two-to-four exposures part of the design.

### Subjects and Procedure

One hundred and forty-four respondents were recruited—36 for each of the four between-subjects cells; after no-shows and dropouts, 131 provided usable data for both sessions. These were housewives and working women aged 20 through 55 from the South San Francisco, California and nearby areas. They were paid $20 for their participation in the two one-hour sessions. Not necessarily representative of American women generally, their assignment to different cells was randomized. The study was described as one in which university researchers were studying the factors that influenced how consumers felt about the content of TV broadcasts (program content, network announcements, advertisements, etc.). Respondents were told that the videotaped programs they would watch were actual TV programs already broadcast, and that since the researchers were interested in finding out how consumers felt about the programs in conditions as similar as possible to watching them at home, the programs would be shown to them complete with the sorts of announcements and ads with which they would be seen at home.
Respondents viewed the 30-minute videotape and then answered questions on the cover story (e.g., program liking, viewing habits, the viewer's lifestyle), within which were embedded manipulation checks (see section on Measures) on the motivational and ability antecedents. Note that the procedure and measures were identical for all frequency conditions and that no dependent measures were collected in this first session in order to minimize possible reactivity.

In their second session, exactly one week later, another videotape with another program and embedded commercials was played with identical viewing instructions. Questions on prior episode viewing, episode ratings, and episode likes and dislikes were then administered as before. The next set of questions measured, in sequence, ad recall, brand familiarity, brand attitudes, purchase intentions, and brand usage. These were embedded within cover story questions (e.g., program content recall, liking, and videotaping intentions), and included test, control, and filler brands.

Finally, they were told that since "how you feel about the ads (in the programs) could influence your feelings about the program" their ratings of certain ads were desired. The three test ads in their cell were then shown again, in sequence, and ratings were obtained for each on (1) prior exposure to the ad (before the experiment), (2) the number of "thoughts about product claims" they had while they watched the ad (manipulation check on the degree of support/counter argument production), (3) informativeness (manipulation check on the "opportunity" variable), and (4) emotional impact and likeness (possible covariates for an "affective-rational" confound). Before leaving, they were told to write on the back of the questionnaire any comments they had about either the purpose of the study or specific questions. These comments were used to assess the incidence of demand artifacts.

Measures

The manipulation check on the motivational antecedent asked the respondent how important it was to her, when buying any brand in each of the categories listed, that she bought exactly the brand that she did (five-point scale, "most important" to "least important"). The check on the ability antecedent (category knowledgeability) asked for a self-rating of her knowledge about which features one might look at, in choosing among different brands, with such knowledge coming not only from usage but also from magazines, ads, family and friends, and so on. The seven-point familiarity measure is expected to be a somewhat more sensitive measure of brand salience than the dichotomous recall measure. Brand attitudes were assessed through six semantic differential items: pleasant-unpleasant, useful-useless, cold-warm, poorly made-well made, friendly-unfriendly, and the best (in the category)–the worst. The mean for all six items was used in the analysis; factor analyses revealed one major factor, and the Cronbach alpha was 0.93.

Brand purchase intentions were assessed on a seven-point scale anchored with "definitely would buy" and "definitely would not buy." (The use of a single intentions measure could pose potential problems of unreliability, though the measure selected is one used frequently.)

The test ads were rated on prior exposure (before the study) as having been seen never, once or twice, quite often, or very frequently before the experiment. The number of thoughts subjects had about the claims the ad was making about the product—either positive or negative (support arguments or counter arguments)—were rated on a seven-point "many thoughts" to "few thoughts" scale; this served as a manipulation check on the differences in the generation of such responses across the four cells. It should be clearly understood that this is a measure of claimed—not independently validated—support argument and counter argument production. Such a measure is not without precedent, however: Cacioppo and Petty (1985, p. 106) cite a study by Schumann (1983) that also used a 10-point scale of self-reported cognitive response production frequency in a study of repetition effects. Our pilot study (reported in Batra 1984) found a significant ($p < 0.01$) correlation between this self-reported measure and a count by a judge (from a retrospective verbal protocol of the proportion of ad-evoked thoughts that dealt with the brand), although the absolute magnitude was low ($r = 0.24$).

The ads were also rated on the amount of product information (seven-point scale from "had no infor-
ANALYSIS AND RESULTS

Demand Artifacts

Of the 131 respondents who attended both sessions, two indicated that they may have suspected its stated intent. For this reason, analysis was restricted to the other 129 respondents.

Manipulation Checks

Manipulation checks (Table 3) indicated that the low motivation/ability cells were significantly lower than the high motivation/ability cells on both the motivation measure (low = 2.64, high = 3.62, p < 0.001, 385 d.f.) and the ability/knowledge measure (low = 2.77, high = 3.47, p < 0.001, 385 d.f.). Further, as intended, prior usage was in fact higher for the high motivation/ability level than for the low level (3.42 vs. 2.81, p < 0.001, 385 d.f.).

Analysis of the low and high “opportunity” marginals showed that the “more argument” ads were seen as significantly more informative (“few arguments” = 4.02, “many arguments” = 4.73, p < 0.001, 385 d.f.). Further, tests of the affective/rational confound showed that while the “few argument” ads were significantly more likeable (“few arguments” = 4.81, “many arguments” = 4.29, p = 0.003, 385 d.f.), they were only directionally stronger in emotional impact (“few arguments” = 4.06, “many arguments” = 3.80, p = 0.097, 385 d.f.).

However, while the motivation/ability difference held significantly not only for the marginals but also across relevant individual cells, this was not true of the “number of arguments” difference. While the “informativeness” rating was different (p < 0.001, 190 d.f.) across the “opportunity” cells within the low antecedent motivation/ability treatment, it was not different within the high antecedent motivation/ability treatment. Probably as a result, the four cells did not order as expected on the claimed level of cognitive response production, as measured by the self-rating of whether the viewer had few/many thoughts about the claims made by the ad about the brand. While the lowest cell mean was for the low motivation/ability few-arguments execution cell, as expected, the highest cell mean was for the high motivation/ability many-arguments execution cell but for the high motivation/ability few-arguments execution cell (see Table 3). However, multiple comparison tests indicated that this highest level was not significantly different from the level for the high motivation/ability many-arguments cell (the one expected to be highest).

The hypothesized differences in response between high and low “claimed cognitive response production” (CCRP) cells were therefore tested as planned, using cell contrasts between the high motivation/ability many-arguments execution cell (high CCRP) and the low motivation/ability few-arguments cell (low CCRP).

Tests of Hypotheses

The repeated measures analysis of variance assumption of “compound symmetry” (Winer 1971, p. 596) was tested through the hypothesis that the covariance matrix of the dependent variable is a diagonal matrix (Bock 1975, p. 459), using Box’s M analog of Bartlett’s test for sphericity. Since this homogeneity assumption was upheld in every case to be reported here, only the univariate results are given here. Further, since sample sizes were slightly unequal across cells, unbalanced estimation was performed, using the unweighted means regression approach (Winer 1971, p. 600). Tests for

6Note that the number of respondents rather than the number of experimental subgroups is used as the unit of observation, since individuals were allocated randomly to subgroups, which were allocated randomly to treatments, with two subgroups per group to minimize inter-group history confounds. Further, experimental occasions were randomized across time of day and day of week. (ANOVA runs using experimental sessions as covariates showed the covariates to be in-

(Continued p. 440)
linear and quadratic trend were done using non-equal spacing intervals for the repetition levels, i.e., as 1, 2, and 4 exposures.

For brand familiarity, brand attitudes, and brand purchase intentions, the dependent measure used was the extent to which the treatment condition observations were higher than the mean for the control (zero exposure) level, in absolute terms. Since three replicates are involved in each cell, each with its own pre-exposure level, and with these replicates differing between the motivation/ability levels, it is clearly more appropriate to make between-cell comparisons using the mean of each replicate's growth over its own control than to compare absolute post-exposure cell means, which depend on the specific replicates used in each cell. These gain scores (averaged between replicates) were thus used in the analyses.\(^7\) Ad recall was analyzed as the percentage of respondents recalling the test ad. Several studies have shown that analysis of variance can be performed safely on nominal data if the number of observations per cell is 30 or more (Cochran 1947; Mandeville 1969), though the practice is controversial.

Only the within-subjects ANOVA results are reported below, since the between-subjects results are not of hypothesized interest. Only two of the twelve between-subjects tests conducted were significant at \(p < 0.05\); on both brand familiarity and recall, the differences between the high and low motivation/ability treatments were significant. The mean square error terms in these between-subjects tests, with 125 d.f., ranged from a low of 0.14 (for recall) to a high of 5.0 (for purchase intentions).\(^8\)

**Purchase Intentions.** As can be seen from Table 4, the mean gain over control in purchase intentions is 0.145 for one exposure, 0.128 for two, and 0.457 for four. Frequency is thus not significant as a within-subjects factor (see Table 5), though the linear trend by itself approaches significance at \(p < 0.10\) (\(F = 3.09, d.f. 1,125\)).

Of the interactions with frequency, only the interaction between frequency and motivation/ability is significant, at \(p < 0.05\) (\(F = 4.30, d.f. 2,250\)). While the intentions gain for high motivation/ability rises from 0.289 for one exposure to 0.394 for two, it then drops to 0.140 for four; for low motivation/ability, however, it shows almost no gain over control for one or two exposures but then rises dramatically to 0.778 for four. (It should be noted that here, as at other points discussed later, every reported mean that falls below the control mean actually has a 95 percent confidence interval that includes zero gain, indicating that, for that level, the mean growth was not significantly different from zero. Obviously, this did not happen for all levels, for otherwise there would be no significant results.)\(^9\) Hypothesis 2, therefore, is supported: the gain is greater for low (than for high) motivation/ability. Further, this interaction is significant even when analysis is restricted to the unconfounded two to four frequency range (\(F = 7.97, p < 0.01, d.f. = 2,250\)), and this level would stay significant even if the experimental subgroups were used as the denominator in the \(F\)-test (\(F\) to attain significance at \(p = 0.05\) with 2, 20 d.f. = 3.49). However, Hypothesis 3 (greater gain for low opportunity) is not supported (\(F = 1.75, d.f. = 2,250\)), though the results are directionally consistent. This interaction fails to reach significance even when the emotional impact and liking covariates are used.

The contrast between high and low claimed cognitive response production (CCRP) cells, as stated in Hypothesis 1 (greater purchase intentions gains for low than for high levels of claimed support argument and counter argument production) is significant at \(p < 0.05\) (\(F = 3.62, d.f. = 2,250\)). (As mentioned earlier, the high and low claimed cognitive response production cells are, respectively, the high motivation/ability, many arguments cell and the low motivation/ability, few arguments cell.) While intentions gains for high CCRP falls from 0.35 for one to 0.08 for two exposures, before falling further to −0.23 for four, intentions gains for low CCRP starts at −0.02 for two, and keeps rising dramatically to 0.77 for four. The interaction approaches significance at \(p\)
TABLE 4

LEVELS OF REPETITION IMPACT ON "GAIN OVER CONTROL"

<table>
<thead>
<tr>
<th>Source</th>
<th>Low motivation/Ability</th>
<th>High motivation/Ability</th>
<th>Motivation/Ability</th>
<th>Opportunity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>Frequency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low arguments* (n = 31)</td>
<td>Low arguments (n = 33)</td>
<td>Low arguments* (n = 32)</td>
<td>Low arguments (n = 64)</td>
</tr>
<tr>
<td>Purchase Intentions</td>
<td>1.00</td>
<td>.95</td>
<td>.98</td>
<td>.96</td>
</tr>
<tr>
<td>Attitudes</td>
<td>-2.46</td>
<td>-2.31</td>
<td>.08</td>
<td>-1.42</td>
</tr>
<tr>
<td></td>
<td>.768</td>
<td>.788</td>
<td>-2.22</td>
<td>.778</td>
</tr>
<tr>
<td>Ad Recall (%)</td>
<td>1.00</td>
<td>.95</td>
<td>.98</td>
<td>.96</td>
</tr>
<tr>
<td>Brand Familiarity</td>
<td>-2.95</td>
<td>-.19</td>
<td>1.76</td>
<td>-.043</td>
</tr>
<tr>
<td></td>
<td>-.009</td>
<td>1.37</td>
<td>.54</td>
<td>.066</td>
</tr>
<tr>
<td></td>
<td>.499</td>
<td>.507</td>
<td>-.33</td>
<td>-.206</td>
</tr>
</tbody>
</table>

* Low claimed cognitive response production (CCRP).

** High CCRP.

TABLE 5

REPETITION IMPACT ON "GAIN OVER CONTROL": WITHIN-SUBJECTS ANOVA

<table>
<thead>
<tr>
<th>Source</th>
<th>F-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Purchase intentions</td>
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<tr>
<td>Frequency</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2,250</td>
</tr>
<tr>
<td>Linear</td>
<td>1,125</td>
</tr>
<tr>
<td>Quadratic</td>
<td>1,125</td>
</tr>
<tr>
<td>Motivation/Ability with frequency</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2,250</td>
</tr>
<tr>
<td>Linear</td>
<td>1,125</td>
</tr>
<tr>
<td>Quadratic</td>
<td>1,125</td>
</tr>
<tr>
<td>Opportunity with frequency</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2,250</td>
</tr>
<tr>
<td>Linear</td>
<td>1,125</td>
</tr>
<tr>
<td>Quadratic</td>
<td>1,125</td>
</tr>
<tr>
<td>Motivation/Ability with opportunity with frequency</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2,250</td>
</tr>
<tr>
<td>Claimed cognitive response production with frequency</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2,250</td>
</tr>
</tbody>
</table>

* p < .10.
** p < .05.
*** p < .01.
* Cell 1-4 contrast.

Brand Attitudes. The average attitude gain over control was zero for one exposure, +0.22 for two exposures, and +0.28 for four. The main effect for frequency is not significant (F = 2.08, d.f. = 2,250), with the linear trend alone significant at p < 0.05 (F = 3.78, d.f. = 1,125). The interactions of frequency with the within-subjects variables are significant only for motivation/ability, at p < 0.05 (F = 3.44, d.f. = 2,250). Hypothesis 2, predicting greater attitude gains for low than for high motivation/ability, finds support. While the attitude gain for high motivation/ability rises rapidly from 0.05 for one exposure to 0.37 for two, it subsequently drops to 0.07 for four; for low motivation/ability, on the other hand, the attitude gain for one exposure is -0.04 over control, rises somewhat to 0.07 for two, but then continues to rise to 0.50 for four exposures. When analysis is restricted to the unconfounded two- to four-exposure levels only, this interaction stays significant at p < 0.05 (F = 6.19). Inconsistent with Hypothesis 3, however, high and low opportunity ads do not respond significantly differently to frequency (F = 0.86, d.f. = 2,250), even when the "affective" ratings of the ads are used as covariates.

Hypothesis 1 predicted greater attitude gains for low CCRP levels. The contrast between the high and low claimed cognitive response production (CCRP) cells is significant at p < 0.05. Attitude gain for high CCRP = 0.065 when restricted to the unconfounded two- to four-exposures portion of the design (F = 3.45).
rises from -0.08 for one to +0.18 for two exposures before falling to -0.21, while attitude gain for the low CCRP cell keeps rising from -0.30 for one, through -0.01 for two, to +0.50 for four. When tested for only the two- to four-exposure levels, this interaction stays significant at \( p < 0.05 \) (\( F = 4.41 \)).

**Ad Recall and Brand Familiarity.** On average, across all four cells, ad recall rose from 8 percent for one exposure to 26 percent for two exposures and 88 percent for four. The main effect of frequency is therefore highly significant (\( F = 201.3, \text{d.f.} = 2,250, p < 0.001 \)). The linear trend is significant at \( p < 0.001 \) (\( F = 544.3, \text{d.f.} = 1,125 \)) and the quadratic trend is significant at \( p = 0.054 \) (\( F = 3.79, \text{d.f.} = 1,125 \)). For familiarity, average gain over the control condition was -0.07 for one exposure, 0.00 for two and 0.42 for four. The main effect for repetition is thus significant at \( p < 0.01 \) (\( F = 4.78, \text{d.f.} = 2,250 \)). When partitioned into a linear and quadratic trend, only the linear trend is significant (\( p < 0.01; F = 10.71, \text{d.f.} = 1,125 \)). As expected, no significant interactions exist at \( p < 0.05 \) between frequency and any antecedent variable. The opportunity (ad execution style) for both recall and familiarity. However, the motivation/ability antecedent interacts with frequency on brand familiarity at a marginally significant level of \( p = 0.074 \) (\( F = 2.63, \text{d.f.} = 2,250 \)).

**DISCUSSION**

The results support the hypothesized interactions of repetition effects (on attitudes and intentions) with the levels of the motivation/ability antecedent of support argument and counter argument production, and support the interactions of repetition with the cells having the highest/lowest levels of such claimed production. Although they are directionally consistent with the hypotheses, however, the results for the opportunity antecedent of such production (operationalized through the number of arguments in the ad execution) are not statistically significant. It is important to note that the motivation/ability results are significant even if analysis is restricted to the two repetition levels (two and four) that do not suffer from the time-of-measurement confound mentioned earlier, as are the results for the contrasted levels (high, low) of claimed cognitive response production.\(^{10}\) Thus, while interpretation of the gain from one to two exposures is confounded, the statistically significant crossover interaction of interest occurs between the two- and four-exposure levels and is not subject to those caveats. Some rival hypotheses, purporting to explain these results, are now discussed.

**Rival Hypotheses**

First, it might be argued that the ads for the high motivation/ability conditions were also different from the ads in the low motivation/ability conditions in evoking more negative reactions to either message argumentation, execution style, or both, such that with repeated exposures, such ads would be more likely to show downturns rather than upturns in the dependent measures of interest. This is not supported, however, by data from the pilot study (Batra and Ray 1985) in which the ads were pre-tested for the valence and quantity of various mediating responses they evoked (the data are not repeated here, for the sake of brevity).

Second, it might be argued that ceiling effects prevailed differentially between the high and low motivation/ability conditions, such that ads in the high level reached them first and thus failed to show further growth between the second and fourth exposures. Note that for this to explain the observed results, the data must show a pattern where the absolute levels of the dependent variables for the high motivation/ability level reached their ceiling at the four exposure level but those for the low motivation/ability level did not.

Table 6 presents the absolute levels of post-exposure attitudes and purchase intentions—as well as the gain figures—for the two motivation/ability levels, by exposure frequency. The mean absolute levels for the "high" product categories are significantly higher (\( p < 0.05, \text{d.f.} = 127 \)) than the ones in the "low" level on the 1-7 scale of measurement for both attitudes and purchase intentions for the one- and two-exposure levels. This is so because more responses for the "high" level came from (presumably more satisfied) users, as was intended in manipulating "ability." However, the means are not significantly different for the four-exposure level (\( p = 0.537 \) for attitudes, 0.868 for intentions, \( d.f. = 127 \)), so that if the dependent variables bumped into their ceilings at four repetitions, they must have done so for both the high and low motivation/ability cells, and a differential ceiling effects explanation would not hold. Further, the absolute values are at least a scale point away from the highest value (7). Finally, the high motivation/ability cell did show significant growth (\( p < 0.05 \) for both attitudes and intentions) over control at the two-exposure level at the absolute ratings shown, so these two-exposure absolute levels are not yet at the ceiling. Since the four-exposure absolute levels are directionally lower than these two-exposure absolute levels, the four-exposure absolute levels, too, must be below the ceiling. Thus a ceiling effect explanation is unlikely, if still possible.

Third, it might be speculated that the "high" motivation/ability ads may have had higher exposure levels prior to the experiment than the "low" ads, leading to

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\(^{10}\)Post hoc contrasts showed the motivation/ability treatment interacting with frequency for both intentions and attitude gains at \( p < 0.10 \) for the one-to-two exposures contrast and at \( p < 0.05 \) for the one-to-four exposures contrast. When just the high and low CCRP cells were compared, the interactions with frequency were not significant across frequency levels one and two, but were significant at \( p < 0.05 \) when frequency levels one and four were contrasted.
lower measured growth within the experiment. Analysis that compared the self-reported prior (to the experiment) exposure levels for the test ads between high and low motivation/ability levels showed, however, that no significant differences in such prior exposure are detectable.

These three rival hypotheses, therefore, do not convincingly explain the observed results. While the theoretical mechanism stated earlier for these results (the differential production of support arguments and counter arguments) was not tested in this study, some process evidence is available, though of a different kind. (Evidence on the differential production of support and counter arguments as a function of repetition has been provided by studies cited earlier, such as Cacioppo and Petty 1979.) This mechanism may operate in addition to the cognitive response mechanism suggested by Cacioppo and Petty (1979). Just as individuals appear to peripheral cues only in conditions of low motivation/ability, their linkages to dependent measures of interest may be different, and the high impact of repetition on such “salience” measures may be transmitted differentially to the dependent measures of interest, leading to differential impact of repetition on those dependent measures themselves. These data agree with earlier results suggesting such differential impact of salience in high and low motivational involvement conditions, such as the “three hierarchies” research presented in 1973 by Ray et al. (see also Beattie and Mitchell 1985). This mechanism may operate in addition to the cognitive response mechanism suggested by Cacioppo and Petty (1979). Just as individuals appear to determine their preferences on the basis of other peripheral cues only in conditions of low motivation and/or ability, so also may they use brand salience as an heuristic, or peripheral cue, only in such conditions. This “familiarity heuristic” thus deserves further research.

**CONCLUSION**

The motivation/ability interactions just discussed do, of course, require replication. This study combined motivation and ability as one antecedent; as pointed out earlier, the two are conceptually distinct, and ought to be studied as separate antecedents where possible. Further, the operationalizations of these antecedents ought to be different in future studies. High usage brands, one of the ability operationalizations in this study, might have added more than just ability; it might also have increased support argumentation and reduced counter argumentation, and such a potential confound should be avoided. Such studies could also then investigate three-way interactions: how do the interactions of frequency with motivation depend on the levels of response opportunity prevailing within different levels of ability?

Note also that this study did not collect mediating process information, in terms of the levels of support and counter argumentation produced, relying instead on self-reports about such production which were not independently verified. We are therefore not in a position to tell why the hypothesized opportunity interactions with frequency did not achieve statistical significance. It appears most likely that this occurred because of a manipulation that was not strong enough, or
that it was confounded with an “affective-rational” difference that could not be statistically controlled through the covariates used. Indeed, such differences in the “affective” nature of the executions could have influenced the mediating response process in complicated and unknown ways: a highly affective execution might, through raising the level of arousal, raise cognitive response production even though the number of message arguments is low (see Ray and Batra 1983 for a review), though this is obviously a speculative interpretation. Future studies in this area could thus usefully include a check on actual cognitive response production to examine hypothesized mediating processes.

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REFERENCES


