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Many advertisers believe the pictorial and verbal components of an ad should convey the same meaning. Based on theoretical and empirical evidence from a variety of areas, three experiments were conducted that show superior recall for ads in which the picture and copy convey discrepant information about product attributes when the picture and brand name are linked interactively. An elaborative processing explanation for the effect is supported by the finding that this superiority diminishes if consumers have less opportunity to process the ad and form associative linkages in memory.

Picture-Word Consistency and the Elaborative Processing of Advertisements

Virtually all forms of marketing communications rely on a combination of verbal and nonverbal elements to convey the intended message. Within the store, manufacturer point-of-purchase displays, packages, and retailer on-site merchandising materials often feature colorful graphic and visual elements along with verbally oriented elements to attract consumer attention and convey a message about a product. Outside the store, newspaper and magazine advertisements as well as television commercials often emphasize their message through the same form of visually oriented communications, whereas radio uses music and sound effects. Despite this prominent use of nonverbal elements as message cues, surprisingly little research has examined the effects of nonverbal cues on consumer information processing. Even less research has investigated the effective integration of verbal and nonverbal elements in the design of marketing communications. Recent studies on the effects of pictorial material in print advertisements generally has examined the impact of pictures added to verbal material in comparison with verbal material alone. Because of the prominence of marketing communications containing both verbal and visual material, the determination of the most effective *integration* of visual and verbal cues warrants more attention.

We report research that examines alternative combinations of pictorial and verbal material in print advertisements. Specifically, our interest is in consumer memory for messages in which the semantic content of pictorial material is consistent with or discrepant from the verbal copy. After summarizing previous research on the effects of pictorial material in advertisements, we use theory and research from a variety of areas as a framework for formulating hypotheses. We then test the hypotheses and discuss the implications of the findings.

PREVIOUS RESEARCH

Research on the inclusion of pictures in advertisements is of two broad categories. In one the effects of pictorial messages on *memory* are tested and in the other the impact of pictures on consumer *attitudinal* responses is studied. Each type of effect is worthy of study—attitudes because of their anticipated link to purchase behavior and memory because of the impact of internal information throughout the consumer decision process. Memory effects also can be a basis for inferring the nature of consumer information-processing activities. (Lynch and Srull 1982 offer a useful perspective on memory as a basis for understanding consumer information processing.) In our study we use memory as a basis for understanding consumer processing of pictures and words that differ in meaning within an advertisement. There-

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fore, we restrict our literature review to research on the memory effects of pictures.[1]

Research in cognitive psychology provides substantial evidence that in a wide variety of memory tasks pictures are remembered better than words (Alesandrini 1982; Paivio 1971). Though less plentiful, research in a consumer context confirms this finding. Using photographs taken from advertisements, Shepard (1967) found that previously seen pictures were recognized accurately when presented alongside novel pictures to a greater extent than verbal material tested in the same way.

More recent research has examined the conditions leading to picture superiority in an attempt to gain an understanding of the picture superiority effect. Using advertisements taken from the Yellow Pages of telephone books, Lutz and Lutz (1977) compared interactive pictures, noninteractive pictures, and their verbal counterparts in terms of their impact on brand name recall. Interactive pictures were those in which the brand name and product class both were included in a pictorial format (e.g., a picture for Rocket Messenger Service showing a courier atop a rocket in flight). Noninteractive pictures consisted of either the brand or the product class (but not both) in a visual format. The verbal-only condition consisted of the brand–product class verbal referents without an accompanying picture. Ony in the case of interactive pictures was the learning of pictures superior to the learning of words in a test of brand name recall.

Childers and Houston (1984) examined immediate and delayed brand name recall for interactive pictures versus brand–product class verbal referents when processed at sensory versus semantic levels. They found picture superiority in immediate recall when stimuli were processed at a sensory level but no superiority when stimuli were processed at a semantic level. However, pictures elicited better recall in the delayed measure under both levels of processing. Though she did not use interactive pictures, Kisielius (1982) also found that verbal information accompanied by a pictorial representation of the verbal content was recalled more readily than the verbal information alone.

Edell and Staelin (1983) compared framed pictures, unframed pictures, and exclusively verbal content in terms of subjects' recall of brand-relevant items and aspects of the messages they saw (e.g., layout, tone). Framed pictures were messages that included verbal material equivalent in content to the picture. Unframed pictures were messages that consisted only of the picture. Verbal messages consisted of the verbal descriptions. Superior recall occurred for the framed pictures over both unframed pictures and verbal-only messages.

Collectively the studies cited provide compelling evidence that consumers process pictorial material in advertisements differently than verbal material, as revealed by the superior memory effects of pictures. However, the differential effects of picture-word similarity and dissimilarity warrant further attention. Verbal material semantically different from pictorial content affords an opportunity to convey additional information about a product. For example, a picture can convey information about one product attribute while the verbal copy discusses another attribute. The examination of potential positive and detrimental consequences of such messages in comparison with those of messages with picture-word overlap is the purpose of our study.

THEORETICAL FOUNDATIONS

The effects of presenting similar versus discrepant information within a message, whether in a picture-word format or an entirely verbal format, have not received focused attention in marketing research. Consequently, adherence to a single theory for purposes of hypothesis generation is not appropriate. Theoretical principles and empirical findings from several theoretical domains are available as a basis for anticipating the memory effects of alternative combinations of picture-word content in advertisements. These domains include the specific area of person memory and judgment within social cognition, text comprehension, and schema theory. Collectively, they allow the development of hypotheses about overall memory and the specific content of memory for ads with alternative picture-word combinations.

Perhaps the most extensive model with potential relevance to the issues of interest is the associative storage and retrieval model proposed by Hastie (1980) in the study of person memory. He hypothesized that information incongruent with a prior expectancy about a person is remembered better than information congruent with that expectancy. The essence of this explanation is that information incongruent with a prior expectation (i.e., information in direct conflict with the expectation) is more difficult to comprehend and, when received, will be held in working memory longer than congruent information. In other words, incongruent information stimulates more elaborate internal processing. The result is a greater number of associative pathways linking the incongruent information to existing knowledge. These additional pathways make the incongruent information more retrievable from memory, thereby enabling greater recall. Hastie and Kumar (1979), Hastie (1980), Srull (1981), and Lui and Brewer (1983) all report support for this model.

A considerable amount of evidence contradicts the predictions of the Hastie model, asserting instead that individuals tend to remember more readily information that is congruent with a prior expectancy. Srull (1981) summarizes this research and resolves the apparent discrepancy by suggesting that the nature of the memory task influences whether congruent or incongruent information is remembered best. In a *recall* task incongruent

[1]Research on attitudinal effects is reported by Mitchell and Olson (1981), Mitchell (1983), Percy and Rossiter (1983), Edell and Staelin (1983), and Kisielius and Sternthal (1984).

information is remembered best because the greater number of associative paths enhance retrieval. However, in a *recognition* task the retrieval process is bypassed. When congruent information is presented, it is linked to expectancies at the prototypical level, thus allowing easier recognition. Srull (1981) further points out that virtually all of the studies finding greater memory for congruent information involved a recognition task. He presents a series of experiments that conform to the predictions of the Hastie model and show the memory superiority of incongruent information is eliminated in recognition tasks (Srull 1981).

In the area of text comprehension, O'Brien and Myers (1985) developed and tested a proposition similar to that of the Hastie model. Specifically, they examined the relative memory effects of text difficult or easy to comprehend. Ease of comprehension was manipulated by imbedding an expectation and subsequent predictable or unpredictable information within the same text material. Predictable information following the established context of the material represented relatively easier comprehension. Unpredictable information represented a more difficult level of comprehension. O'Brien and Myers hypothesized that under more difficult levels of comprehension subjects would engage in more elaborative processing by attempting to integrate the unpredictable material into preceding portions of the text. The result would be improved memory and recall under conditions of more difficult comprehension. O'Brien and Myers found evidence supporting this contention.

Finally, research in the area of schema theory provides insights into the issues we explore. Recent research in a consumer behavior context has examined information processing effects when consumers receive information either congruent or incongruent with an activated schema. Meyers-Levy and Tybout (1986) tested the effects of giving consumers product attribute information that was either entirely congruent or partially incongruent with an activated schema. In the context of soft drinks, partial schema incongruity was achieved by including descriptive information on an attribute ("all natural") not normally associated with soft drinks. Though the research primarily considered evaluative reactions to the product, a portion of it examined the hypothesis that schema inconsistency stimulated more effortful processing and improved memory over schema consistency. The results supported the hypothesis.

Research in the context of salesperson effects on consumer information processing (Sujan, Bettman, Sujan 1986) has used schema theory as a basis for anticipating consumer responses to salespeople whose characteristics are either consistent with or discrepant from the consumer's salesperson schema. When consumers encounter a salesperson who matches the typical salesperson, they resort to simple heuristics to form impressions and engage in information processing during the sales encounter. An encounter with an atypical salesperson triggers greater information processing because consumers depend more on product-specific information presented by the salesperson to form impressions. A series of findings generally confirmed these expectations.

The studies cited reflect a diversity of theoretical domains and research contexts. Common throughout them, though, is a fundamental result: when individuals have expectations, either created within the research procedures or schema-based, and they receive information that deviates from the expectations, they engage in a more elaborative form of information processing than when information meeting their expectations is encountered. Furthermore, the studies by O'Brien and Myers (1985), Meyers-Levy and Tybout (1986), and Sujan, Bettman, and Sujan (1986) suggest the deviation from expectations need not to be as strong as that implied by the Hastie model to have this effect. Apparently the discrepant nature of the information is sufficient to prompt elaboration and it need not be in direct conflict with the expectation.

The preceding discussion conveys the theoretical framework used to anticipate differences in the basic process by which consumers encode ads containing alternative combinations of picture-word content. This framework identifies two key conditions for predicting memory effects of within-message variations in picture-word content.

1. An expectation must be established as a basis for deeming subsequent information consistent or discrepant.
2. Adequate opportunity for processing must be present to allow elaborative encoding and the formation of memory paths when discrepant information is encountered.

Given the presence of these two conditions, recall of the content of messages containing discrepant information should exceed that of messages containing consistent information. An important point to emphasize here is that these conditions suggest a format different from that of a message merely presenting two pieces of information. It is not the quantity of information that accounts for the anticipated superiority of messages with discrepant content. Rather, it is the creation of an expectation followed by information that deviates from the expectation. If two pieces of information are presented in a message but one does not create an expectation about the other, such a message will not be processed as extensively as a message meeting the two conditions. The issue is how to integrate the elements of a message (i.e., pictures and copy) to establish these conditions.

The nature of pictorial stimuli suggests that pictures can be used effectively to imbed expectations within a message. For example, Holbrook and Moore (1981) argue that, in general, pictures promote a more holistic and integrative form of processing than do words. However, an interactive picture portraying the brand name and product class may be a specific pictorial device particularly effective in establishing expectations within a message. The greater memorability of interactive over noninteractive pictures has been demonstrated by Lutz

and Lutz (1977). Alesandrini (1982) further suggests that interactive pictures can be effective strategies for communicating a product name and a prime benefit (speed of delivery in the preceding example). More important to our research is her suggestion that an interactive picture can serve as an *advance organizer*. An advance organizer cues the receiver to the content or importance of the subsequent messages, that is, it creates an expectation of what is to follow. Implicit in this role of advance organizer is the assumption that recipients of picture-word messages attend to the pictorial component first. Indirect support for this premise comes from traditional advertising design principles, which advocate the use of pictures in ads for their "attention-getting" ability and the belief that artwork is usually the first part of the ad to be examined (Bolen 1984). Also, perception research using eye movements has found that fixations are influenced by pattern variability or irregularity in shapes or forms (Haber and Hershenson 1980; Mackworth and Morendi 1967). The distinctiveness of the lines and curves of the pictorial vocabulary in comparison with the verbal vocabulary is another factor underlying the picture superiority effect (Nelson, Reed, and Walling 1976). Additionally, Mitchell (1983) reports that when subjects evaluated a primarily visual advertisement, concurrent protocols indicated the visual information was used to form a verbal understanding of the advertised brand. These findings support the premise that the pictorial component of the ad is likely to be examined initially and has the capacity to establish an expectation for the verbal part of the ad.

HYPOTHESES

The nature of interactive pictures serves as a basis for integrating pictures and copy within a message, either consistently or discrepantly, and hypothesizing the effects. Interactive pictures can be used as an advance organizer to imbed an expectation within the advertisement. Verbal copy that is either consistent with or discrepant from the picture can follow the picture. Comparisons between interactive consistent and discrepant ads enable us to investigate the processing strategy invoked and its effects on memory. Elaborative processing of the discrepant copy should establish a more extensive associative network in memory, enhancing retrieval and subsequent recall. Comparisons with corresponding messages in which the same visual material is associated with different brand names (i.e., noninteractive) and accompanied by the same copy can be examined to eliminate a quantity-of-information explanation of the superior memory for discrepant messages. Such an explanation would not rely on the elaborative processing mechanism elicited by the expectations embedded in the interactive inconsistent ads. In this context the following hypotheses are offered.

H_1: Total recall of the copy of ads containing interactive pictures is superior to that of ads containing noninteractive pictures.

H_2: Total recall of the copy of ads containing interactive pictures accompanied by discrepant verbal copy is superior to that of ads with interactive pictures accompanied by consistent verbal copy. For ads containing noninteractive pictures, no difference in recall occurs between consistent and discrepant messages.

Support of H_1 would reaffirm the superiority of messages with interactive pictures over those with noninteractive pictures. Findings consistent with H_2 would be much more compelling for the purposes of our research. They would establish the effectiveness of picture-word discrepancies in an advertisement and the role of interactive pictures in forming the expectation on which the consistency or discrepancy of the copy would be based.

The content of advertising copy typically entails more information than simply the consistent or discrepant information. Advertising copy includes brand names, product classes, attribute information, and other information such as phone numbers and addresses. Consequently our key theoretical premise should be tested by means of a measure that captures the entire memory network resulting from an ad—not just memory for consistent or discrepant information. If discrepant information stimulates more elaborative processing of copy content and copy content contains information beyond just the discrepant information itself, the entire copy will be processed more elaboratively. Thus, the entire memory network for the ad copy should be different for messages with discrepant verbal content and H_2 should be tested by using total recall of the content of ad copy.

In advertising research the specific content of memory for an ad is of interest in addition to overall memory. However, our hypothesized elaborative processing mechanism pertains to the latter and offers limited guidance for predicting the specific content of the memory network. To arrive at hypotheses about the specific content of memory, we return to O'Brien and Myers' (1985) research in a context that conforms more closely to that in advertising research. They imbedded an expectation and subsequent expected or unexpected information within the same text material and hypothesized an elaborate process for coping with unexpected portions of the text. Of interest here is their prediction about the specific nature of the elaboration: when unexpected material is confronted, subjects will attempt to integrate the unexpected material with *preceding* portions of the text. When expected material is confronted, no such process occurs. Thus, text material containing unexpected information will yield improved memory for the unexpected information *and* for material preceding it in the text. O'Brien and Myers (1985) report findings that support their predictions. We now have a basis for hypothesizing the specific content of the memory network for consistent ads versus discrepant ads.

H_3: A product attribute contained in discrepant verbal copy of interactive ads is recalled better than a product

attribute contained in consistent verbal copy of interactive ads.

This hypothesis reflects the fact that it is the product attribute that is manipulated as either consistent with or discrepant from the attribute conveyed by the picture.

Two additional hypotheses can be developed by using the O'Brien and Myers (1985) findings.

H_4: Recall memory for verbal information preceding discrepant information in an interactive ad is superior to recall memory for corresponding information in consistent interactive ads.

H_5: Recall memory for information following verbally presented attribute information does not differ between consistent and discrepant interactive ads.

Noninteractive ads are not expected to produce the pattern of effects suggested in H_3 through H_5 for interactive ads because the former fail to establish expectations about the content of verbal material.

The prediction in H_3 is not expected to apply to both recall and recognition measures of memory. Srull (1981) indicates that the prototypical nature of consistent information leads to its easier recognition. This notion is consistent with a distinction commonly made between recall and recognition tasks, that is, recognition does not involve a retrieval process but requires only the discrimination of presented items from previous items (Lynch and Srull 1982). The notion that a recognition task would not benefit from the increased associative linkages formed in the processing of discrepant information, but would benefit from the prototypical nature of processing consistent information, leads to the following hypothesis.

H_6: Recognition memory for consistent information in interactive ads equates to that for discrepant information in interactive ads.

The key to the anticipated superior recall effects of discrepant messages is that the discrepant verbal material prompts elaborative processing, that is, copy material is held in working memory for a longer time. If less elaborative processing occurs, the superiority of discrepant message recall over consistent message recall should be reduced or eliminated. One approach for reducing the amount of processing is to limit the opportunity to engage in elaborative processing by reducing subjects' time of exposure to a message. The implications for advertising are important because different exposure conditions (e.g., print vs. broadcast media) vary in available exposure time and therefore in the extent to which they allow elaborative processing of messages. Accordingly, the following general hypothesis (restricted to the use of interactive pictures) is suggested.

H_7 As the time of exposure to messages is reduced, the superiority of the memory effects of discrepant messages over those of consistent messages diminishes.

Three experiments were conducted to investigate the hypotheses. Experiments 1 and 2 address H_1 through H_6 and experiment 3 addresses H_7.

EXPERIMENT 1

Design

Two independent variables were manipulated in a 2 × 2 factorial design. The first factor represented the interactive versus noninteractive nature of the picture part of the ads. Interactive pictures are those that pictorially represent the brand name and product class, whereas noninteractive pictures bear no relationship to the brand name and may or may not represent the product class. In our study interactive pictures were designed also to convey a brand attribute (e.g., durability) to establish a basis for consistent or discrepant verbal material to follow. For the noninteractive treatment condition the same pictures were used but were associated with unrelated brand names.

The second independent variable represents the consistency factor. Pictures were combined with either consistent verbal content (i.e., copy that described the same attribute portrayed in the picture) or discrepant verbal material (i.e., copy that described an attribute different from the one represented in the picture). Hence if a picture conveyed durability, consistent copy discussed durability whereas discrepant copy discussed a different attribute (e.g., value).

Message Development

Ten professionally produced pictures (black-and-white line and shaded drawings) were used. These pictures and their interactive brand names were selected from a set developed for use in a previous study, at which time pretests had established that each picture adequately conveyed its intended attribute (Childers and Houston 1984). Thus, for example, Bullett Trucking Company was portrayed by a picture of bullet-shaped trucks with a man riding a bullet on top of the trucks. Pretests had established that this picture conveyed the attribute of "on-time service." For the present research we developed a noninteractive brand name and consistent and discrepant verbal copy to accompany the picture.

In generating brand names for the noninteractive treatment, we avoided names high in mnemonic value (e.g., bizarre names, rhymes, alliterations). In developing the copy part of a message, we used the same number of sentences and roughly equivalent number of words for corresponding consistent and discrepant copy. Across the 10 ads, the number of words ranged from 30 to 40. The verbal part of the ad always appeared under the picture and occupied 20 to 30% of the space. The brand name and product class always were mentioned near the beginning of the copy. All copy material other than the attribute information was identical across treatment conditions.

A pretest was conducted to ensure that consistency was being manipulated effectively. Pretest subjects were assigned randomly to either consistent or discrepant mes-

Table 1
KEY COMPONENTS OF EXPERIMENTAL ADS

Product class	*Interactive brand name*	*Noninteractive brand name*	*Attribute portrayed in picture and consistent copy*	*Attribute portrayed in discrepant copy*
Auto tires	Rhino	Bell	Durable/tough	Good value
Express mail	Rocket	Capitol	Speedy delivery	Pride in service
Pest control	Arrow	Global	Effective	Long-time community presence
Fences	Superman	Oak	Strength	Customized fences
Trucking	Bullet	Viking	On-time service	Safe transit
Auctioneer	Owl	Rose	Knowledgeable/wise	Low cost
Pizza	On-the-run	Star	Quick delivery	Delicious taste
Auto parts	Dollar	Ball	Inexpensive	Friendly
Plumbing	Tool-ready	Bear	Always on call	Reliable work
Electrician	Airborne	Dolphin	Quick service	Reasonable cost

sages and asked to rate the extent to which the pictures and words for each message conveyed the same meaning. The group receiving the consistent messages rated picture-word overlap significantly higher ($p < .01$) than did the group exposed to the discrepant messages. Also, each group rated its messages in the appropriate intended direction. Table 1 provides details of each of the 10 messages and their treatment variations.[2]

Procedures

Subjects for experiment 1 were 112 undergraduate students enrolled in a basic marketing course at a major midwestern university. They were assigned randomly to one of the four treatment conditions, resulting in cell sample sizes of 28 subjects. The experiment was conducted in a group setting in which subjects were told they would be evaluating a set of advertisements early in the development stage.

All test messages and measures were contained in booklets randomly assigned to subjects. Ads were placed in random order in each booklet. However, the tasks performed by subjects were always in the same order. Subjects first were given an example and practice ad not contained in the set of 10 test messages.

Subjects were exposed to each ad for 15 seconds and then told to turn the page. They were given 45 seconds to complete a series of semantic differential items about the previously seen brand and ad. This exercise served as a filler task between exposures to the series of ads.[3] The same sequence was repeated until subjects had viewed and evaluated the 10 messages assigned to them

Next subjects were given a 3-minute distractor task consisting of a social desirability measure and a set of demographic questions. Then they were allowed 10 minutes to complete written protocols in which they were told to write down everything they could remember about the advertisements they had viewed. Separate boxes were provided for each ad. Subjects could recall ads in any order. After the written protocols, subjects were given two minutes to perform an aided recall task. Each of the 10 product classes contained in the messages was listed with a blank to the left. Subjects were instructed to fill in the brand names.

Measures

To obtain a total recall score and analyze effects on the recall of various components of copy, we developed four measures of memory for specific copy elements of each ad from the unaided written protocols.

1. Product class recall—correct mention of the product class represented in the ad.
2. Brand name recall—correct mention of the brand name of the advertised product or service.
3. Copy attribute recall—correct reference to the product attribute conveyed in the copy.
4. Additional copy recall—correct mention of specific copy information beyond brand, product class, and copy attribute. This information included such items as the presence of phone numbers, location, or how to contact the advertiser. It always followed the mention of the copy attribute in each ad.

Two graduate students who did not know the purposes of the research served as coders for the measures. They were given coding format sheets outlining the key elements of ad copy. For each memory protocol provided by a subject, the coders indicated whether each element was recalled correctly. The two coders demonstrated an intercoder reliability of .91 across all coded pieces of information. Any discrepancies were discussed and resolved by the coders with the researchers before analysis of the findings.

The redundancy of product attribute information in the picture and copy of consistent ads presents difficulties

[2]Ideally, a pretest establishing the equal memorability of verbal copy in the absence of pictures would have been appropriate. However, the fact that the words were identical (except for the attribute) suggests it is not unreasonable to assume equivalence.

[3]These items also served as global measures of affective reactions to the ad and brand. Analyses showed no significant effects on these measures.

in computing total copy recall scores and making comparisons between treatment variations on copy attribute recall. The difficulty lies in ascertaining, for subjects exposed to consistent ads who correctly mentioned the product attribute, whether the source of the information was the picture or the copy. This situation precludes exclusive focus on memory for the verbal part of each ad. Consequently, certain modifications in the computation of total copy recall and the analyses of total copy recall and copy attribute recall were necessary in experiment 1. Experiment 2 was conducted in part to eliminate this difficulty.

For the initial analysis, a total copy recall score (TCR1) that excluded copy attribute recall was computed. Component recall scores on product class, brand name, and additional copy information were totaled for each subject in each of the four cells across the 10 ads. Such a measure captures any variations in overall memory networks resulting from the different treatments and controls for redundancies. Second, a total copy recall score that included copy attribute recall (TCR2) was computed similarly for subjects exposed to discrepant ads. For each total copy recall measure, summed scores across the 10 ads were used in the analyses.

Analyses also were performed to determine whether component recall scores varied in the same ways. Again, for copy attribute recall, comparisons were restricted to the two discrepant cells. In addition, a measure of brand name recall based on the aided recall measure was developed. For purposes of analysis each of the component recall measures was represented for each subject by the sum of the correct responses across the 10 ads.

Results

Experiment 1 allows complete tests of H_1, H_2, H_4, and H_5 and a partial test of H_3. Treatment means for each dependent variable are reported in Table 2. The following discussion summarizes the results of the planned contrasts relevant to each hypothesis.

Analysis of variance on TCR1 shows strong support for H_1. Interactive ads elicit recall significantly superior to that of noninteractive ads ($F = 23.34$, $p < .001$).

Table 2
EXPERIMENT 1 FINDINGS

Dependent variable	Treatment means			
	Interactive		Noninteractive	
	Consistent	Discrepant	Consistent	Discrepant
TCR1	11.66	13.34	8.46	9.68
Unaided product class	6.63	7.29	6.28	6.36
Unaided brand	3.44	4.61	1.14	1.04
Additional copy	1.59	1.43	1.04	2.29
Aided brand	3.59	5.39	.86	1.36
TCR2	—	13.75	—	10.68
Copy attribute	—	.43	—	1.00

Furthermore, the comparison between the two discrepant cells on TCR2 reveals significant superiority for interactive ads ($t = 2.70$, $p < .005$). These findings replicate previous empirical support for interactive ads but do not address the fundamental issue of the research—the effects of discrepant pictures and words.

The appropriate series of one-way contrasts (with $p = .05$) provides strong support for H_2. For TCR1 a significant difference ($t = 1.66$) in the hypothesized direction is found between the means for interactive discrepant and interactive consistent ads but not between consistent and discrepant ads within the noninteractive cell ($t = 1.22$). Furthermore, the mean value in the interactive discrepant cell significantly exceeds ($t = 3.63$) the mean in the noninteractive discrepant cell. This pattern of results suggests it is the discrepancy from the expectation created by the interactive picture that accounts for the superiority of such ads. The null effects in the noninteractive cell and the superiority of the interactive discrepant cell over the noninteractive discrepant cell eliminate the quantity-of-information issue as a competing explanation. A unique encoding process appears to occur for interactive discrepant cells.

H_3 pertains to recall of the copy attribute and predicts it will be superior when the copy is discrepant from the picture. Because of the inability to ascertain the source of memory for the product attribute in consistent ads, treatment comparisons on copy attribute recall are restricted to the discrepant cells. Partial support for H_3 would be indicated by superior recall in the interactive version. However, copy attribute recall is found to be significantly greater in the noninteractive version ($t = 2.19$, $p < .05$).

H_4 is based on the expected specific nature of the process by which discrepant ads are encoded. Research by O'Brien and Myers (1985) suggests that when an unpredictable item is encountered the message recipient attempts to integrate it with previously processed information. In our research brand name and product class information immediately preceded unpredictable information. Recall data on brand name and product class were examined to determine whether component recall scores conform to the H_4 prediction. The same series of contrasts used to test H_2 was used to test H_4.

Summing unaided product class and brand name recall forms a single measure of memory for information preceding the discrepant copy that can be used to test H_4. Performing the series of contrasts on this measure yields support for H_4. The two interactive cells differ significantly ($t = 3.05$), the noninteractive cells do not ($t = .03$), and the discrepant cells do ($t = 4.50$). For product class recall alone, the pattern of means conforms to prediction. Recall is greatest for interactive discrepant ads. However, it is not significantly greater than recall of interactive consistent ads ($t = 1.47$). The other two contrasts fit expectations. Null effects are found within the noninteractive cell ($t = .18$) and the interactive discrepant cell mean significantly exceeds its noninteractive

counterpart (t = 2.07). For both unaided and aided brand name recall, the pattern of results of the contrasts fits expectations. For unaided brand recall the interactive cells differ significantly (t = 2.39), the noninteractive cells do not (t = .20), and the discrepant cells do (t = 7.29). The corresponding t-values for aided brand recall are 4.00, 1.11, and 8.96, respectively.

All other information in the copy appeared after mention of the copy attribute. As predicted in H_5, recall of this information is not significantly greater (t = .38) for interactive discrepant ads than for interactive consistent ads.

Discussion

The results of experiment 1 provide generally strong support for the superior memory effects of interactive discrepant ads. The superior overall memory network associated with such ads lends support to the key theoretical premise of the research. The interactive picture creates an expectation about the content of the verbal material. When the verbal material presents discrepant information, a more elaborative form of processing occurs, leading to enhanced memory.

Evidence supporting the hypothesized specific nature of the elaboration is not as strong. Though recall of information preceding and following discrepant copy information conforms to predictions, recall of the specific piece of discrepant information does not. This result does not detract from our theoretical basis for anticipating improved memory for discrepant ads. It does, however, raise doubts about whether the *specific* nature of the elaboration conforms to that suggested by O'Brien and Myers (1985). For example, the specific content of recall may be explained more by retrieval processes than encoding processes. Because of the fictitious nature of the brands used in the research and the more extensive memory network for interactive discrepant ads (as shown by total recall measures), retrieval efforts may have been directed more at accessing labeling information (brand and product class) for previously unknown brands. If retrieval cues had been provided to help subjects structure the retrieval effort, the specific content of memory could be attributed more directly to encoding processes. The additional cues provided by a structured task would differentiate between recall effects attributable to a failure to generate a cue category (a retrieval deficit), such as "the attribute(s) conveyed in the ad," and those due to a failure to encode the information in memory at initial exposure (a storage deficit). Furthermore, a structured recall task would enable us to ascertain more readily whether the memory source for consistent product attribute information was the picture or the verbal material. Experiment 2 was designed to examine these issues.

EXPERIMENT 2

A second experiment was conducted to assess more directly the specific nature of the elaborative encoding process used when discrepant material is presented. Data collected through this experiment enabled us to replicate tests of H_1 and H_2, examine further the processes represented by H_3 through H_5, and test H_6, which states that consistent product attribute information as well as discrepant information will be *recognized.*

Design and Procedures

The design of experiment 2 was identical to the 2 × 2 factorial design of experiment 1. The same sets of ads were used for the treatments. A total of 116 student subjects were assigned randomly to the treatments, resulting in equal cell sizes of 29 subjects.

All procedures were identical to those in experiment 1 with the exception of the method used to collect recall data and the addition of a recognition task. In place of a completely unaided recall task, a structured recall task was administered. This task differed from the one in the first experiment in that category cues were provided for the major elements of the ad (brand name, product class, copy attribute, and picture attribute), as well as for a category associated with other less pertinent information such as phone numbers. Subjects were given 10 pages on which to indicate separately for each ad all the information they could recall within each of these categories. The aided brand name task followed this task, as in experiment 1. The final task was a recognition test for the product attribute. Each product class was specified. A set of five product attributes was given for each product class, one of which was the product attribute actually discussed in the copy. Subjects indicated which of the set of attributes was presented in the ad they had seen.

Results

The results of experiment 2 are summarized in Table 3, which gives treatment means. The effects on total memory correspond closely to those observed in experiment 1. TCR1 and TCR2 in the interactive discrepant cell significantly exceed those in both the interactive consistent (t = 4.02, 1.66, respectively) and noninteractive discrepant (t = 5.55, 5.80, respectively) cells. Null effects on TCR1 (t = .25) are found in the noninteractive

Table 3
EXPERIMENT 2 FINDINGS

Dependent variable	Treatment means			
	Interactive		Noninteractive	
	Consistent	Discrepant	Consistent	Discrepant
TCR2	13.31	14.97	12.72	9.17
TCR1	9.55	12.93	8.48	8.27
Product class	5.76	7.07	6.62	6.34
Brand name	2.96	4.14	.86	.72
Copy attribute	3.76	2.03	4.24	.90
Additional copy	.83	1.72	1.00	1.21
Aided brand name	3.83	5.17	1.03	.83
Copy attribute recogniton	8.19	2.54	7.80	2.72

cell. Though a significant effect is seen on this comparison for TCR2, the direction of the difference is opposite what would be damaging to the theoretical premise of the research.

The overall pattern of effects on component recall scores does not support the hypothesized specific nature of the encoding process. Though memory for product class and brand name conforms to expectations, memory for other components of the copy does not. Contrary to H_3, recall of the copy attribute is superior in consistent ads (t = 4.81). Recall of copy content appearing after the discrepant copy attribute is superior under interactive conditions (t = 4.81). Thus, the specific pattern of results suggested by H_3 through H_5 is not confirmed. The encoding process suggested by O'Brien and Myers (1985) is not evident.

The second experiment included a copy attribute recognition test. Recognition of the consistent copy attribute is superior to that of the discrepant copy attribute (t = 10.66) under interactive conditions. Thus, the expected pattern of difference in recall and recognition for specific consistent and discrepant information is not observed. Superior recognition *and* recall of consistent product attributes are found.

Though experiment 2 does not confirm the specific encoding process hypothesized, it does support the elaborative processing explanation of the general encoding process for ads that present discrepant verbal information. The third experiment was designed to test a specific proposition underlying the model.

EXPERIMENT 3

The results of experiments 1 and 2 support elaboration as the explanation of the superior effects of combining interactive pictures with discrepant verbal copy. With this theoretical framework as a guide to understanding how consumers process these types of messages, we can begin to identify and test the conditions under which the results of experiments 1 and 2 can be expected to hold or not hold. H_7 specifies one such condition: when the opportunity to engage in elaborative processing is restricted, the superior memory effects of interactive discrepant ads should diminish. Experiment 3 tested this hypothesis.

Design and Procedures

Experiments 1 and 2 established the general superiority of messages with interactive pictures over those with noninteractive pictures. They also provided evidence that interactive pictures can be used to embed expectations within a message. Therefore, experiment 3 included only messages with interactive pictures in a 2 × 2 factorial design. The consistency factor was manipulated in the same way as in experiments 1 and 2 with the same messages. The second factor was exposure time. One level of exposure time was 15 seconds, the length of exposure time used in experiments 1 and 2. The reduced level of exposure time was 10 seconds. A pretest revealed that 10 seconds was the minimum time necessary to process the picture and orally read through the copy once.

A new pool of 80 student subjects was assigned randomly to the four treatments. Except for the 10-second exposure time as a manipulation, the procedures of experiment 3 were identical to those of experiment 1 (i.e., the key recall task was unstructured). The same measures were used as dependent variables.

Results

Data analysis procedures again consisted of planned contrasts to test the general hypothesis. As before, the key variable for hypothesis testing was TCR1. Component recall scores also were examined to determine the extent to which they conformed to previously observed patterns. Furthermore, two-group comparisons involving the discrepant cells were performed on TCR2 and on copy attribute recall. Table 4 summarizes the mean values for each dependent variable. The specific contrasts necessary to support H_7 should show memory for discrepant ads significantly in excess of memory for consistent ads under 15-second exposures, but not under 10-second exposures.

The key finding related to the theoretical purposes of experiment 3 is for TCR1. The planned contrasts show superiority for discrepant ads under 15-second exposure times (t = 2.40), but not under 10-second exposure times (t = 1.31). Thus, the results on the central variable support H_7. This pattern carries over to several component recall measures. Discrepant ads are superior under 15-second exposures for product class recall (t = 1.71), unaided brand recall (t = 2.98), and aided brand recall (t = 2.00), but not under 10-second exposures (t = 1.10, 1.36, and .96, respectively).

Because only discrepant cells are examined in the two-group comparison of TCR2, the results of this test are less relevant. The comparison does show a significantly higher level of recall for messages in the 15- than in the 10-second exposure time, and hence may confirm that reducing exposure time did restrict elaborative processing. A similar result is found for the specific recall of the copy attribute.

Two important points emerge from experiment 3. First,

Table 4
EXPERIMENT 3 FINDINGS

Dependent variable	*15-second exposure*		*10-second exposure*	
	Consistent	*Discrepant*	*Consistent*	*Discrepant*
TCR1	9.25	12.00	8.50	10.00
Unaided product class	5.70	6.55	5.45	6.00
Unaided brand	2.50	4.15	1.70	2.45
Additional copy	1.05	1.40	1.35	1.05
Aided brand	4.20	5.35	3.85	4.40
TCR2	—	13.50	—	10.70
Copy attribute	—	1.50	—	.70

we find additional evidence supporting the superior memory effects of discrepant messages of the type investigated. Second, based on the underlying theory guiding our research, a condition in which this result weakens is identified. When the opportunity for elaborative processing of verbal material is limited by a reduced exposure time, the superiority of messages with discrepant verbal content diminishes.

CONCLUSIONS AND IMPLICATIONS

Our findings provide evidence contradictory to a common belief that the pictorial and verbal components of an advertisement should convey the same message (cf. Schultz 1981). Semantically discrepant pictures and words were combined in a way that yielded recall superior to that observed for semantically consistent pictures and words. Specifically, by using an interactive picture to convey one attribute and establish an expectation in combination with copy discussing a different attribute, we elicited better recall of copy material.

Three separate experiments in which this finding was obtained provide support for the theoretical basis of the hypothesized explanation. The essence of the explanation is that an interactive picture establishes an expectation about the content of verbal material. When discrepant verbal information is encountered, more elaborative processing occurs and results in a more extensive memory network for the ad. Experiments 1 and 2 show that the mere quantity of information contained in such ads is not a plausible alternative explanation. Experiment 3 shows that elaborative processing at encoding is central to understanding the observed effects. When the opportunity for elaborative processing is restricted by reduced exposure times, the superiority of discrepant messages diminishes.

Experiment 2 was conducted to examine further the specific nature of the elaborative processing effort. We hypothesized that subjects' attempts to integrate the discrepant information into previously seen material would lead to superior memory for information preceding the discrepant copy but equivalent memory for information following it. The findings do not support this hypothesis. Such ads yielded superior memory for information both preceding *and* following the discrepant content. Thus, these ads appear to result in an elaboration that spreads throughout the ad. For advertising purposes, this effect is more desirable than the one hypothesized. Furthermore, what appears sufficient to prompt this elaboration is the establishment of an expectation followed by discrepant information that need not be in sharp contrast to the expectation. We used product attributes different from, but not in conflict with, the expectation. This finding suggests advertisers have more latitude in creating messages to achieve the observed effects than is implied by social cognition research.

The final major finding pertains to memory for the specific verbal element (the product attribute) that makes the ad consistent or discrepant. We hypothesized that recall of the discrepant attribute would exceed recall of the predictable attribute, but that recognition of the consistent attribute would be equivalent. Experiment 2 shows both recall and recognition to be greater for consistent than for discrepant product attributes. The recall findings are counter to O'Brien and Myers' (1985) observations and may be due to the redundancy of the information in consistent ads. Another possible explanation is that the dual-code nature of the consistent information makes it more readily available in memory (Paivio 1971). Finally, Mandler (1982) offers insights into how slight incongruities may *depress* memory for the incongruity.

Poorer recall of the discrepant copy attribute in interactive ads does not detract from their tactical superiority. Such ads promote superior overall learning of message content. Remembering attribute information without linking it to a specific brand would be of little benefit. Brand name recall for other types of messages included in the study is substantially lower. Hence, these ads may be particularly useful during the introductory phase for a brand, when creating consumer awareness is a primary marketing objective. An important consideration in the use of discrepant content is identified in the final experiment—advertisers should ascertain whether the exposure conditions that allow elaborative processing and/or the individual factors leading to it (e.g., high involvement or individual differences in motivation) are present.

The practical limitations of our study suggest possible directions for future research. For example, we investigated alternative combinations of pictures and words and used pictures of a specific type—interactive pictures—to establish expectations by conveying brand attribute information. However, many companies cannot use interactive pictures because their brand names are not suited to such a portrayal. Future research should examine other potential means for establishing expectations from which discrepant information can follow. The possibilities include other types of pictures, other nonverbal stimuli (e.g., music), and even verbal material.

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