

# The Effects of Incidental Ad Exposure on the Formation of Consideration Sets

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This study extends research on incidental ad exposure by examining whether incidental exposure to an ad increases the likelihood that a product depicted in the ad will be included in a consideration set. Incidental ad exposure implies that an ad receives minimal attentional resources while other more relevant information is being processed. Results suggest that the incidental exposure effect is fairly robust, occurring across a variety of factors (when the consideration set formation context was memory or stimulus based, when the buying situation was familiar or unfamiliar, and across two different product classes). Further, these effects were found despite subjects' lack of explicit memory for the ads.

Given the enormity of advertising clutter (Britt, Adams, and Miller 1972; Webb and Ray 1979) and the fact that consumers are often involved in tasks that occupy attention and limit ad processing (MacInnis, Moorman, and Jaworski 1991), it is quite likely that a majority of advertisements do not receive any active processing (Bauer and Greyser 1968). Interestingly, however, recent research has indicated that incidental exposure to advertisements can have an effect on subsequent judgments (see, e.g., Janiszewski 1988, 1990a, 1990b, 1993).

In a typical incidental exposure paradigm, subjects are directed to focus their attention on a primary task (e.g., reading an article), thus reducing the resources available to process secondary information (e.g., advertisements) surrounding the primary information. In most cases, the secondary information is located to the left or right of the primary information and is described by its distance (in degrees) from the primary information (e.g., parafoveal is 1.5–5 degrees from the attended information, peripheral is greater than 5 degrees from the attended information). Because the secondary information does not receive direct foveal attention, and since attentional resources available for processing the secondary information are

limited, it is not surprising that the secondary information cannot be explicitly recognized—memory traces for this information are unlikely to be strong enough to be retrievable during a direct search of memory. For example, Janiszewski (1988) has shown that incidental exposure to advertising that occurs during the reading of a newspaper can enhance a consumer's liking for the ads and brands despite the subject's inability to recognize having previously seen the ads and brands. Subsequent marketing studies have investigated conditions that facilitate processing of secondary information (Janiszewski 1993), the effect this processing has on the comprehension of focally attended material (Janiszewski 1990a), and why this processing affects ad attitudes (Janiszewski 1993; Shapiro and MacInnis 1992).

The purpose of this study is to extend this research by investigating the robustness of incidental exposure effects. Specifically, we examine whether or not incidental exposure to choice alternatives increases the likelihood of their subsequent inclusion in a consideration set. Because inclusion of a product in a consideration set is often a necessary condition for choice (Howard and Sheth 1969), showing whether or not, and under what conditions, incidental ad exposure affects the formation of consideration sets would be an important contribution to the understanding of the effect of low-involvement processing on advertising effectiveness (Krugman 1965); this is done by studying the effects of advertising when minimal levels of attention are devoted to processing the ad.

## HYPOTHESES

A consideration set consists of the brands or products that a consumer would consider purchasing to achieve a

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purchase goal (Reilly and Parkinson 1985; Roberts and Lattin 1991; Wright and Barbour 1977). Typically, the consideration set is smaller than both the total number of brands or products available in the marketplace and the number of brands about which the consumer is aware (termed the "awareness set"; Hauser and Wernerfelt 1990; Nedungadi 1990). In addition, consideration sets may be entirely memory based when products are not externally available for consideration and thus must be retrieved from memory (Alba and Chattopadhyay 1985; Nedungadi 1990), such as when choosing a restaurant or making a shopping list. Alternatively, consideration sets may be stimulus based, when products are available and in view in the purchase environment (Parkinson and Reilly 1979; Reilly and Parkinson 1985); for example, when deciding among items listed on a menu, companies listed in the telephone book, or appliances physically present at an appliance store. Because the purpose of this article is to explore the range of influence of incidental exposure, both memory-based and stimulus-based consideration sets will be examined.

Further, previous research has indicated that incidental exposure can lead to both semantic and feature processing of secondary information. Semantic processing involves the activation and retrieval of a stimulus's meaning representation existing in memory, whereas feature processing involves the encoding and memory storage of a stimulus's surface features. Although not necessarily a direct mapping, it is from these findings that our hypotheses regarding memory-based and stimulus-based consideration sets are derived.

### Memory-Based Consideration Sets

Incidental exposure studies in psychology indicate that secondary information undergoes a semantic analysis in which the memorial representation of the information is accessed from memory, which in turn affects subsequent judgments. For example, Di Pace, Longoni, and Zoccolotti (1991) found that the response time needed to determine if a focally presented word was an animal or nonanimal was facilitated if a parafoveally presented word was (vs. was not) highly associated with the target animal. Additional studies have shown that incidental exposure to secondary information facilitates naming and categorizing semantically related primary information (see, e.g., Allport, Tipper, and Chmiel 1985; Di Pace et al. 1991; Fuentes and Tudela 1992; and Fuentes et al. 1994). Because an alternative's inclusion in a memory-based consideration set depends on that alternative being accessed from memory (Nedungadi 1990), and because incidental ad exposure has been linked to increased accessibility of the information in memory, it is likely that incidental ad exposure will also increase the likelihood that the product depicted in the incidentally processed ad will be included in a memory-based consideration set.

### Stimulus-Based Consideration Sets

Previous research suggests that the effects of incidental ad exposure on stimulus-based judgments (e.g., attitude judgments made in the presence of an ad or brand) are due to a feature analysis that occurs during processing (Janiszewski 1993). This processing allows secondary information to subsequently be perceived more easily (i.e., perceptual fluency) and hence thought to be more familiar, evaluated more highly, and more likely to be seen among competing externally available alternatives (see Janiszewski 1993). We explore whether such incidental ad exposure can also increase the likelihood that the product depicted in the incidentally processed ad will be included in a stimulus-based consideration set.

### Buying-Situation Familiarity

In order to increase the generalizability of our findings, we also explore whether incidental exposure effects can be found across different types of buying situations. Research has shown that the purchase goal and the strength with which it is associated with various alternatives may also affect what alternatives are included in a consideration set (Ratneshwar and Shocker 1991; Srivastava, Alpert, and Shocker 1984). We further test the boundaries of incidental exposure effects by investigating both familiar and unfamiliar buying situations. Buying situations are unfamiliar when either the buying motive is unfamiliar (e.g., clothes to take on a trip to Africa, gifts for a foreign visitor) or when consumers have little familiarity with alternatives that fulfill the goal (e.g., food to order in a Singapore restaurant). In these cases strong associative links connecting the goal with a set of alternatives are absent. In contrast, when the buying situation is familiar, consumers have strong associative links in their memories that connect the buying situation with goal-relevant alternatives.

To summarize, we hypothesize that incidental ad exposure will increase the likelihood that the product depicted in the incidentally processed ad will be included in both a memory-based and stimulus-based consideration set and that these effects will be found in the absence of recognition of the incidentally exposed ad. Further, we attempt to generalize these findings by examining consideration set formation in both familiar and unfamiliar buying situations.

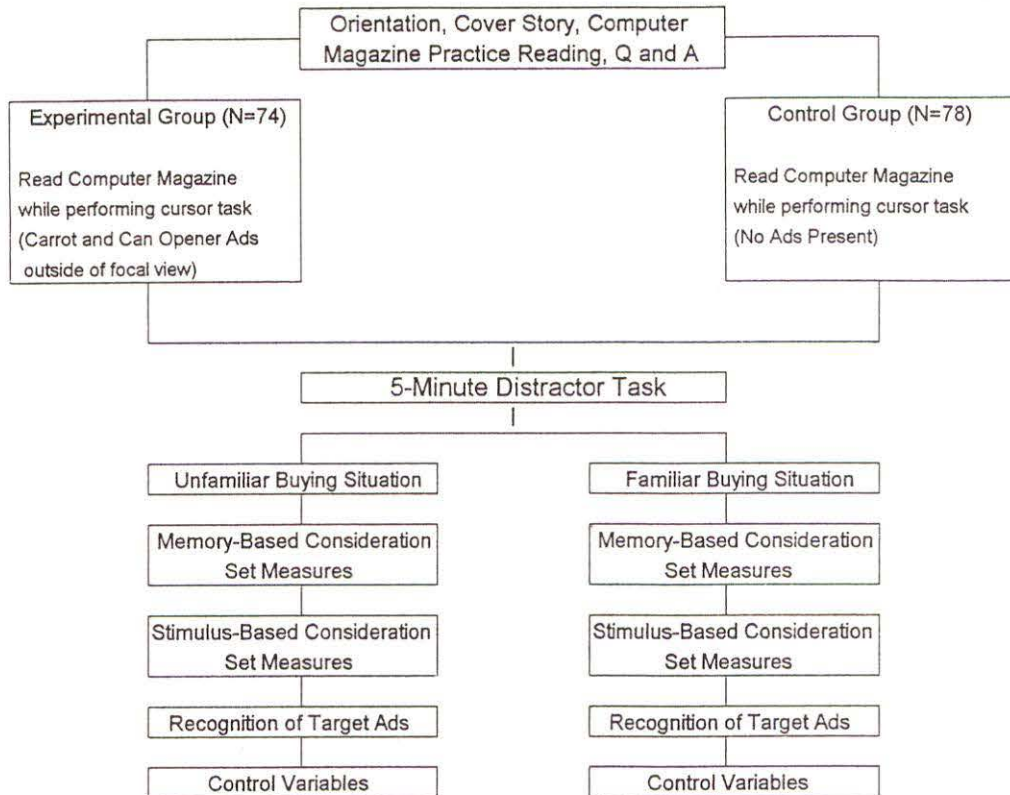
## METHOD

For clarity, the procedure, stimuli, and dependent measures are discussed in the order in which they arose for the subject. Thus, the following discussion will follow the steps outlined in Figure 1.

### Design

The study used a 2 (ads present [experimental group] vs. ads absent [control group])  $\times$  2 (unfamiliar vs. familiar

**FIGURE 1**  
SUMMARY OF DESIGN AND PROCEDURES



buying situation)  $\times$  2 (product replicate) mixed factorial design. As Figure 1 indicates, group and familiarity of the buying situation were between-subjects factors. Product replicate was a within-subjects factor.

## Subjects

One hundred fifty-two undergraduate marketing students participated in the study for class credit. Subjects were assigned randomly to one of two groups. Roughly half ( $N = 74$ ) were assigned to an experimental group and were exposed to the processing instrument containing the target ads. The other half ( $N = 78$ ) were assigned to the control group and were exposed to the same processing instrument without the target ads. From three to 10 subjects participated in each session, which lasted approximately 40 minutes. With the exception of one session with only three subjects, all conditions were represented in each experimental session. Hence, session and condition were not confounded.

## Incidental Ad Exposure

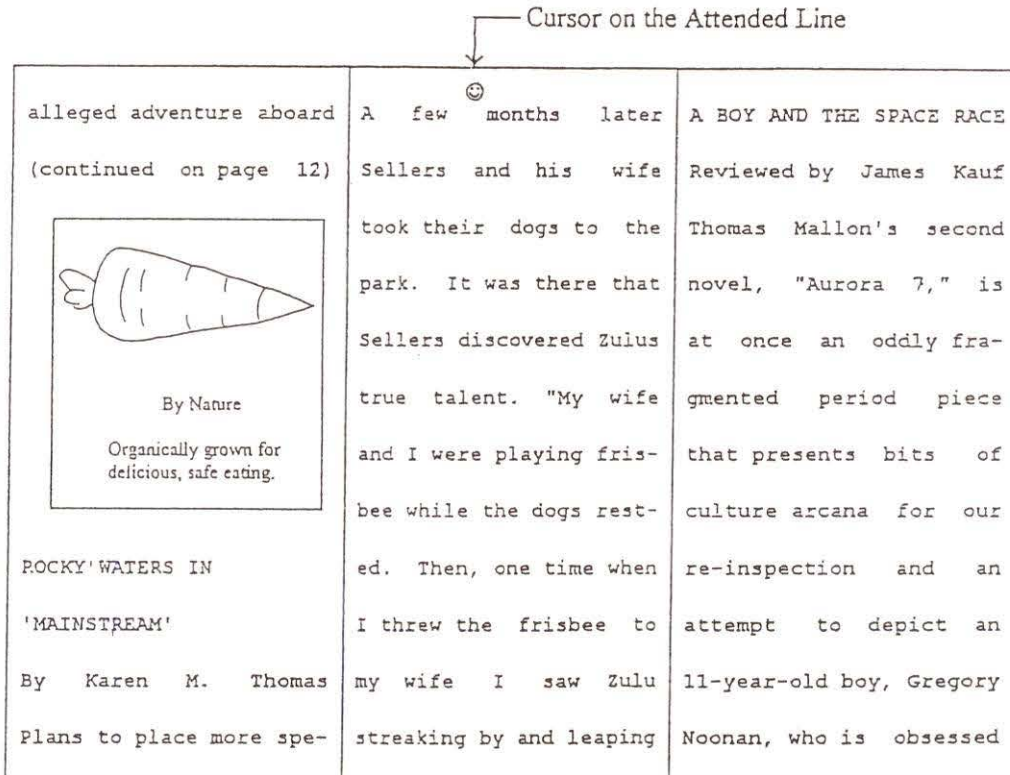
Subjects were told that the study's purpose was to determine the degree to which doing an activity (i.e., guiding a cursor through a computer-controlled magazine article)

interferes with reading articles. They were told that they would read an article in the middle column of the computer screen and that they would be tested for their memory and comprehension of that article. Subjects were not told anything about the presence or absence of ads. The cursor-moving task was then explained. Each subject practiced moving the cursor through the text of a short example article before the reading task started. Any questions were answered at that time.

*Computer-Controlled Magazine.* An instrument was developed that placed the target ads, which were to receive minimal processing, outside of the subjects' focal view while placing the stimulus designed to occupy a majority of subjects' attentional resources in focal view. The method involved a computer-controlled magazine, a depiction of which is shown in Figure 2. The computer screen was divided into three columns by two thin vertical lines. The middle column contained an article that was designed to be the focal-attention task.

Several considerations led to the specific ad placement within the magazine. First, advertisements needed to be placed outside of focal view to create a situation conducive to incidental exposure. Second, advertisements were placed in the left (vs. right) field of view because previous research has suggested that processing of pictorial stimuli

FIGURE 2  
COMPUTER-CONTROLLED MAGAZINE



outside of focal view is more likely if the stimuli are placed in the left visual field and hence processed by the right hemisphere (Janiszewski 1988, 1990b). Thus, target ads were embedded within the computer-controlled magazine's left-hand column between blocks of text (see Fig. 2). The ads occupied a visual field ranging approximately from 2.5 degrees to 11.0 degrees when the subject viewed the left-hand margin of the middle column (the margin closest to the ad) and from 12.5 degrees to 21.0 degrees when viewed from the right-hand margin of the middle column. Articles were placed above and below the target ads to make the computer-controlled magazine similar to an actual magazine (or newspaper).

The information in all three columns of the magazine scrolled up the computer screen line by line at a predetermined rate of 1 line of text per second. Thus, at a certain point in the scrolling process, the target ads appeared in the left column of the screen (see Fig. 2).

*Controlling Attentional Focus.* The computer-controlled magazine was designed to control the subjects' attention so that they focused on something other than the ads. This was accomplished by asking subjects to perform two tasks. One was to comprehend as much of the article displayed in the *middle column* as possible while the article scrolled line by line up the computer screen. At the same time, subjects were asked to perform

a cursor-moving task. As Figure 2 shows, a happy face cursor was depicted on the top line of the middle column (hereafter called the attended line). Subjects could move the cursor left or right on the attended line within the boundaries of the middle column. Their task was to move the cursor in such a way that it did not hit a word when the next line of text scrolled up. Hence, when a line of text scrolled up past the cursor, the cursor needed to be positioned so that it fit in the space between two words. If the cursor did hit a word, an error was detected and a "beep" was sounded. Although this cursor-moving task does not represent an actual viewing situation, it does simulate situations where attention is focused on material other than an ad placed outside of focal view (e.g., driving a car, having a conversation, or quickly reading a magazine article). It thus provides a representative context for understanding incidental ad exposure.

The number of errors provided an "on-line" measure of the allocation of attentional resources. Specifically, a shift in attentional resources from the middle column of the computer-controlled magazine toward a target ad would reduce subjects' performance in the cursor-moving task (i.e., the attentional shift would leave fewer resources available for performing the cursor-moving task). Such a shift might occur because the advertisement is different in features from its surrounding material. Previous testing with the computer-controlled magazine indicates that the

cursor-moving task is sensitive enough that subjects instructed to take one quick glance at the target ads while completing the processing task also make significantly more errors with the cursor-moving task (because their attention is divided when the shift occurs).

To determine the effects of incidental ad exposure on the formation of consideration sets, two versions of the computer-controlled magazine task were developed. The experimental version contained the articles with the ads for a can opener and a carrot. In this version, the order in which the two ads appeared was counterbalanced. The control group version contained the same articles without ads. The area where the ads would have appeared was filled by text.

#### *Development of Target Ads and Buying Situations.*

Since the choice of products to be depicted in the ads depended on the specific buying situations to be used, both products and buying situations were examined in the same pretest. For both theoretical and procedural reasons, we decided to depict products, not brands, as the target stimuli in the ads. We reasoned that if we used brand names as the stimuli in the ads, it would be unclear whether they should be the brand names of high- or low-share brands. Because the dependent variable of interest is an increased chance of inclusion in a consideration set, ceiling effects could be a problem if brand names of market share leaders were used. If low-share brands were used, lack of familiarity with the brand name could cause problems; if the brand name is not even in a consumer's awareness set, it would certainly not be represented in their consideration set.

Using products as stimuli in ads alleviates such problems. Specifically, we felt that by using products we would have a greater likelihood of finding something atypical that was still in memory and still relevant for both the unfamiliar and familiar buying situation. Furthermore, product category advertising is one distinct form of advertising, and previous research investigating situational effects on consideration sets has focused on the product-class level (e.g., Barsalou 1983, 1985; Ratneshwar and Shocker 1991).

Two additional criteria had to be met in selecting the products. First, the products used in the unfamiliar buying situation had to be identical to those used in the familiar buying situation to eliminate the likelihood that a product confound would account for any observed difference between the buying situations. Second, to rule out the possibility of the product simply being more typical for the unfamiliar than for the familiar buying situation or vice versa (Barsalou 1983, 1985), we needed products that would be equally typical for both buying situations. Care also had to be taken in choosing the specific buying situations to be used. Because this study is one of the first in marketing to manipulate unfamiliar versus familiar buying situations, we needed to verify that the buying situations varied in familiarity. These issues were addressed in a pretest.

*Pretest.* Eighteen subjects identified products that they would consider buying in each of 15 buying situations, eight that were thought to be unfamiliar (e.g., a kitchen-related product you would buy if living in an apartment for two months overseas) and seven that were thought to be familiar (e.g., a kitchen-related product you would buy to cook breakfast).

Subjects were told that the purpose of the study was to identify the products they would consider purchasing in different buying situations. To ensure that their responses represented products in their consideration set and not merely products in their awareness set, the subjects were told to list only products that they would personally consider purchasing. They were also told to state only product names, not brand names. A practice run was given to ensure that the subjects understood the task.

Subjects then rated each buying situation, using three self-report measures. The first two items used a nine-point familiarity scale (1 = not at all familiar; 9 = very familiar) and asked, "How familiar do you think people in general are with purchasing products for this situation?" and "How familiar are you with purchasing products for this circumstance?" The last item used a nine-point frequency scale (1 = not at all frequently; 9 = very frequently) and asked, "How frequently have you seen or heard of products that have been bought for this particular circumstance?" A composite index ( $\alpha = .93$ ) representing the average of the three self-report items measures the nature of the buying situation. A low (vs. high) composite index indicates that the buying situation is unfamiliar (vs. familiar).

Based on the pretest results, an unfamiliar and a familiar food-related buying situation were chosen. The familiar buying situation was "food you would buy for a snack one hour before dinner" while the unfamiliar buying situation was "food you would buy one hour before going parachute jumping." The self-report composite index reveals that the former is relatively more familiar ( $\bar{X} = 7.13$ ) than the latter ( $\bar{X} = 2.06$ ;  $t(17) = 3.33$ ,  $p < .02$ ). To further test the generalizability of our findings, an additional familiar and unfamiliar category was chosen. In this case, the familiar buying situation was "a nonfood, kitchen-related product you would buy to cook breakfast" ( $\bar{X} = 6.20$ ), and the unfamiliar buying situation was "a nonfood, kitchen-related product you would buy for a friend whose house was destroyed in a fire" ( $\bar{X} = 1.86$ ;  $t(17) = 3.68$ ,  $p < .001$ ).

Note that it was not critical that these buying situations represent ones that subjects would actually encounter. What was critical for the purposes of the study was that the situations be regarded as relatively more unfamiliar or more familiar and that the products selected for the target ads be equally probable for the unfamiliar and familiar buying contexts. The selected target products met these criteria. The products chosen for the food-related and the kitchen-related buying situations were a carrot and a can opener, respectively. Each was mentioned

equally often (by 11 percent of the respondents) in the unfamiliar and familiar buying situations.

Two advertisements were developed, one for the carrot and one for the can opener. The product depictions filled approximately half of the 2.75 inch  $\times$  2.75 inch advertising frame. To make the ads as realistic as possible, the products were given (fictitious) brand names. Two lines of copy were provided at the bottom of the advertisements. To avoid priming effects caused by the brand name or its copy, both were written in small print. Further, the copy said nothing about possible product uses.

### Distracter Task

After reading the computer-controlled magazine and performing the cursor-moving task, subjects performed a five-minute distracter task that measured their style of processing and their memory for the magazine article.<sup>1</sup>

### Consideration Set Measures

Subjects then were told that their services were needed for another study pertaining to purchasing activities. They were told that they would be exposed to several buying situations and would be asked to indicate the products that they might consider buying for each situation. As Figure 1 shows, subjects were then assigned randomly to the familiar or unfamiliar buying situations. Half of the experimental group ( $N = 39$ ) and half of the control group ( $N = 41$ ) were assigned to the unfamiliar buying situation, while the remaining half of the experimental group ( $N = 35$ ) and remaining half of the control group ( $N = 37$ ) were assigned to the familiar buying situation. Familiarity of the buying situation was therefore a between-subjects variable. The memory-based and then the stimulus-based consideration set measures were then completed.<sup>2</sup>

*Memory-Based Consideration Set Measures.* Each memory-based consideration set measure gave subjects the relevant buying situation and then asked them to list

eight products that they would consider purchasing for that buying situation (Barsalou 1983). The variable of interest was whether subjects mentioned the target products.

*Stimulus-Based Consideration Set Measures.* The stimulus-based consideration set measure was a checklist of products. Subjects were asked to first look through a list of products noted as potential alternatives for a given buying situation and then check the ones they would consider buying for that situation (Parkinson and Reilly 1979; Reilly and Parkinson 1985).

We considered several issues in developing these measures. First, because subjects were given different (unfamiliar vs. familiar) buying situations, we needed to consider whether the checklist should contain a single and hence common set of items or different items tailored to the relevant buying situation. We also needed to consider how many and which product alternatives should be present.

We determined that a common checklist could be used for the unfamiliar and familiar buying situations for the carrot and that a common checklist could be used for the unfamiliar and familiar buying situations for the can opener. The Appendix lists the items in each checklist. This conclusion was based on results from the pretest, which suggested a fair degree of overlap between the product alternatives considered in the unfamiliar and familiar buying situations (more than 60 percent of the products mentioned in the unfamiliar buying situations were also mentioned in their respective familiar buying situations and vice versa). In addition, providing the same checklist for both the unfamiliar and familiar buying situations would rule out differences across checklist measures as the cause of any differences that might be found between the two types of buying situations.

Two stimulus-based consideration set checklists were developed, one for the food-related buying situation and one for the kitchen-related buying situation. Each checklist contained two pages with 10 product choices on each page (i.e., a total of 20 product alternatives). The order of the pages was counterbalanced. To determine the number of alternatives to provide on the checklists, we calculated the set sizes of each of the buying situations observed from the pretest. Set size (the breadth of alternatives mentioned in conjunction with a particular buying situation) was calculated by tallying the number of responses mentioned by at least two subjects in the pretest for each of the four buying situations used in the experiment (Meyers-Levy 1989). The set sizes for both the unfamiliar and familiar buying situations ranged from 18 to 21 items. For consistency across checklist measures, we used 20 products for both checklist measures (see the Appendix).

The number of times a product was mentioned for a given buying situation was noted from the pretest to help us determine which products should be included in the stimulus-based checklist measures. The checklist mea-

<sup>1</sup>We used the Style of Processing scale (Childers, Houston, and Heckler 1985). Our thinking was that since our stimulus was visual in nature low resource processing effects might be more likely for visual as opposed to verbal processors. Notably, though, there were no effects for this variable.

<sup>2</sup>A pretest indicated that prior completion of the memory-based consideration measure does not affect performance on the stimulus-based consideration set measure. This pretest consisted of 38 students who completed the computer-controlled magazine task. Half the subjects then completed a memory-based measure for the first buying situation while the other half completed a memory-based measure for the second buying situation. All subjects then completed the stimulus-based measures for both the first and second buying situations. The measure of interest is a comparison between the frequency with which products are chosen in the stimulus-based measure when preceded by the memory-based measure versus when not preceded by the memory-based measure. This comparison was made for all 20 products used in the stimulus-based measure for each of the two buying situations (a total of 40 comparisons). Only three comparisons were significant, none of which were associated with the target products.

asures were developed such that each checklist contained a similar number of less frequently mentioned, fairly frequently mentioned, and very frequently mentioned products from both the unfamiliar and familiar buying situations. This procedure was used for both the food-related and kitchen-related buying situations.

To parallel ad exposure in the experimental group, each product alternative was depicted *pictorially* with a verbal label below it. Further, to be consistent with the memory-based measure and to prevent subjects from checking all the alternatives on the list, the instructions for the stimulus-based consideration set measures asked that subjects check only eight product alternatives.

### Recognition Measure

After completion of the consideration set measures, subjects completed recognition measures for both target ads. For each recognition measure, subjects were exposed to four ads and were asked to select the ad that was in the computer-controlled magazine. Each forced-choice recognition measure contained one target and three distracter ads. Specifically, the distracters for the can opener ad were ads depicting a cup, a frying pan, and a toaster. The distracters for the carrot ad were ads depicting an apple, a potato, and a candy bar. Several things should be noted about the distracters. First, all distracters needed to be relevant to the buying situation. If they were not, demand effects would have been created. For example, if the recognition set for the carrot included a car, a diamond ring, and a calculator, demand effects would have been created since clearly the carrot is the only one relevant to the buying situation. Second, the distracter ads needed to be sufficiently different from one another and from the target ad in order to make it unlikely that subjects who actually saw the ad could not discriminate which variant in the recognition set was the one they saw (i.e., a carrot, a slightly smaller carrot, a slightly fatter carrot, or a slightly longer carrot).

The forced-choice recognition measure was supplemented by a confidence measure asking subjects to indicate how confident they were that they recognized the correct ad (1 = not at all confident; 9 = very confident). To construct the weighted recognition measure, we gave recognition scores a code of 0 if subjects did not correctly identify the target ad and a code of 1 if they did. This value was then multiplied by the confidence rating response. Results of this measure provide no additional insights to the findings and, thus, will not be discussed further.

### Control Variables

Finally, subjects completed measures of buying-situation familiarity and of several control variables (gender, age, handedness, and video game experience), and then they were debriefed. Since neither style of processing nor

the other control variables influenced the results when used as covariates, they will not be discussed further.

## RESULTS

### Manipulation Check

To test the success of the unfamiliar versus familiar buying-situation manipulation, we examined the three-item self-report index of familiarity ( $\alpha = .80$ ). As expected, the familiar food-related and kitchen-related buying situations were rated as significantly more familiar ( $\bar{X} = 7.63, 6.64$ ) than their unfamiliar counterparts ( $\bar{X} = 2.51, 3.17, t(150) = 23.58$  and  $18.46$ , respectively,  $p$ 's  $< .001$ ). Perceived familiarity of the buying situations did not differ across the experimental and control groups ( $t(150)$ 's  $< 1, p$ 's  $> .3$ ) or across the two ad-order conditions in the experimental group ( $t(72)$ 's  $< 1, p$ 's  $> .5$ ).

### Tests of Incidental Ad Processing

The cursor-moving task error rate and forced-choice recognition measures are used to show that subjects allocated minimal attentional resources to the target ads during the reading task.

*Error Rate.* The control group error rates can be used as a baseline performance level that assumes that a majority of attentional resources are being devoted to the middle column of the computer-controlled magazine; the control group subjects had no motivation to shift their attention from the middle column to adjacent columns, which contained text of the same size and font. Evidence that the subjects in the experimental group did not allocate extensive attentional resources to the products depicted in the ads, and thus supporting the claim of incidental exposure, would be found if a statistically equivalent number of errors on the cursor-moving task were made between the experimental and control groups when the product depictions were visible on the computer screen.

Errors can occur on any of 10 lines of text when each product depiction is fully visible on the computer screen (see Fig. 2), thus error rates ranged from 0 to 10 for each ad. To analyze the error rate data, a repeated-measures MANOVA was run with each version of the processing instrument (control version; first experimental version—with the carrot ad first; second experimental version—with the carrot ad second) as the between-subjects factor and each section of the processing task (the 10 lines of text when the first product was visible; the 10 lines of text when the second product was visible) as the within-subjects factor. In this context, a test for group (control vs. experimental) was done using a linear contrast of the control group version versus the two experimental versions. A test for ad order was done using a contrast of the first experimental version versus the second experimental version. Conducting these tests using contrasts within the MANOVA on the full data set yielded greater power because the degrees of freedom for error are greater than

when analyzing subsets of the data and the error sum of squares is reduced by using a full model (not combining the two experimental versions).

Results indicate that a statistically equivalent number of errors were made between the experimental group ( $\bar{X} = 2.48$ , 24.8 percent error rate) and control group ( $\bar{X} = 2.36$ , 23.6 percent error rate) while the product depictions were visible on the computer screen ( $F(1, 149) = 0.16$ ,  $p > .60$ ). When this analysis was repeated using only the four lines of text when each ad was just parallel to the attended line (where a shift in attention may be most likely to occur), the results are replicated with an equivalent number of errors being made by experimental ( $\bar{X} = .99$ , 24.8 percent error rate) and control ( $\bar{X} = .97$ , 24.3 percent error rate;  $F(1, 149) = 0$ ,  $p > .90$ ) group subjects. Thus, our claim that direct attention was not devoted to the ads while experimental subjects completed the processing task is supported.

Error rate results with the 10 lines of text also indicate that there is a significant section effect, with greater errors occurring in the first section of the processing task ( $\bar{X} = 2.28$ , 28.2 percent error rate) versus the second section ( $\bar{X} = 2.02$ , 20.2 percent error rate;  $F(1, 149) = 33.83$ ,  $p < .001$ ). This seems to indicate a learning effect, with subjects becoming more skilled with the cursor-moving task as they proceeded through the computer-controlled magazine. However, there is no evidence that the total number of errors differs as a function of experimental ad-order version ( $F(1, 149) = 0.27$ ,  $p > .60$ ). The learning effect also appears to be consistent across group and experimental ad-order version as determined through a test for group by section interaction ( $F(1, 149) = 0.37$ ,  $p > .50$ ) and a test for experimental ad-order version by section interaction ( $F(1, 149) = 1.58$ ,  $p > .20$ ). The section effect was not found when the error data using the four lines of text just parallel to the target ads were analyzed ( $F(1, 149) = 1.11$ ,  $p > .30$ ). From this, one may infer that the learning process occurred in the six previous lines of the first section. An analysis of the total errors in these lines shows that the section effect does indeed occur in that range ( $F(1, 149) = 39.31$ ,  $p < .001$ ).

**Recognition.** If ads are processed in an incidental manner, subjects in the experimental group should have forced-choice recognition scores that are no higher than subjects in the control group and no higher than what would be expected by chance. The results support these expectations.

The data were first examined for evidence of an ad-order effect on the recognition response among subjects in the experimental group. This was conducted as a repeated-measures logistic regression with recognition of the carrot ad and can opener ad forming the response profile and with the different experimental versions of the processing instrument as the independent explanatory variable. Neither version ( $\chi^2(1) = .83$ ,  $p > .60$ ) nor the interaction between version and ad ( $\chi^2(1) = 1.26$ ,  $p > .50$ ) were significant. Thus, in subsequent analyses, the two

TABLE 1

MEMORY-BASED CONSIDERATION SET MEASURE ANOVA TABLE FOR THE REPEATED-MEASURES LOGIT

Source	df	$\chi^2$	p
Intercept	1	106.01	.00
Group	1	4.40	.04
Buying-situation familiarity	1	.09	.77
Ad	1	.00	.95
Group $\times$ buying-situation familiarity	1	2.62	.11
Group $\times$ ad	1	2.26	.13
Buying-situation familiarity $\times$ ad	1	5.37	.02
Residual	1	.05	.82

experimental versions of the processing instrument are combined. To compare recognition rates across the experimental ( $N = 73$ ) and control groups ( $N = 77$ ), a repeated logistic regression was run with the two ad-recognition measures forming the response profile and with group as the independent explanatory variable. Neither group ( $\chi^2(1) = .81$ ,  $p > .30$ ), ad ( $\chi^2(1) = 3.06$ ,  $p > .08$ ), nor the interaction between group and ad ( $\chi^2(1) = .19$ ,  $p > .66$ ) was significant. Thus, recognition rates were statistically equivalent across the control (26.0 percent) and experimental (30.8 percent) groups and did not differ across ads. In addition, a one-tailed difference of proportions test indicated that the recognition rate among experimental subjects was no greater than that expected by chance ( $p > .16$ ). Together, the error rate data and the recognition data provide fairly strong evidence that minimal levels of attention were devoted to the target ads during exposure.

### Testing the Consideration Set Hypotheses

Results of two repeated-measures logistic regressions on the experimental group indicate that ad order has no effect on the subjects' probability of choosing the products depicted in the ads for either the memory-based or stimulus-based consideration sets ( $\chi^2$ 's  $< 2$ ,  $p$ 's  $> .10$ ). Thus, subsequent analyses collapse data across ad order. In addition, results of logit analyses indicate that recognition had no effect on the consideration set measures ( $\chi^2$ 's  $< 1$ ,  $p$ 's  $> .33$ ).<sup>3</sup>

A repeated-measures logistic regression was run to test the prediction that incidental ad exposure would increase the likelihood of including the product depicted in the ad in a memory-based consideration set. The results are reported in Table 1. There was a significant main effect for group ( $\chi^2(1) = 4.40$ ,  $p < .04$ ), with more subjects in

<sup>3</sup>Adding the ad-recognition measures for both the carrot ad and can opener ad to the design divides the data into too many groups with too few subjects in some groups to complete the analysis. Thus, separate logits were run for each recognition measure for both the memory-based and stimulus-based consideration sets.



TABLE 2

STIMULUS-BASED CONSIDERATION SET MEASURE ANOVA  
TABLE FOR THE REPEATED-MEASURES LOGIT

Source	df	$\chi^2$	<i>p</i>
Intercept	1	59.27	.00
Group	1	11.97	.00
Buying-situation familiarity	1	2.68	.10
Ad	1	.71	.40
Group $\times$ buying-situation familiarity	1	1.91	.17
Group $\times$ ad	1	.29	.59
Buying-situation familiarity $\times$ ad	1	12.23	.00
Residual	1	.10	.76

the experimental group (21.2 percent) versus the control group (12.2 percent) stating that they would consider the target products when forming a memory-based consideration set. Thus, our prediction is supported. In addition, there was a significant interaction between buying-situation familiarity and ad ( $\chi^2(1) = 5.37, p < .02$ ). This significant interaction is inconsequential to our study and is a result of all subjects' being more likely to include a can opener in the unfamiliar versus familiar buying situation, whereas the opposite pattern of results was found for the carrot. Importantly, the interaction between group and buying-situation familiarity was not significant ( $\chi^2(1) = 2.26, p > .11$ ), indicating that the effects are generalizable across familiar and unfamiliar buying situations. No other effects were significant.

Results for the stimulus-based consideration set measure are identical to the memory-based measure results and are presented in Table 2. A significant main effect of group supports our prediction that incidental ad exposure increases the likelihood that the product depicted in the ad will be included in a stimulus-based consideration set ( $\chi^2(1) = 11.97, p < .001$ ). Whereas 37.8 percent of experimental subjects indicated they would consider buying the target products in the stimulus-based consideration set, only 20.5 percent of control subjects indicated that they would consider them. Again, there was a significant buying-situation familiarity  $\times$  ad interaction ( $\chi^2(1) = 12.23, p < .001$ ) due to can openers' being chosen more often by all subjects in unfamiliar buying situations versus familiar situations, while carrots were chosen about equally often across the two buying-situation conditions. No other effects were significant, including the interaction between group and buying-situation familiarity ( $\chi^2(1) = 1.91, p > .17$ ).

There still may be concern that the effects of incidental ad exposure on the stimulus-based consideration set measure may be partly driven by its effects on the memory-based measure even though a pretest indicated that completion of the memory-based consideration set measure does not affect subsequent completion of the stimulus-based measure.<sup>4</sup> To eliminate the possibility of this type

of carryover effect, an additional analysis was conducted on the stimulus-based measure with subjects mentioning the target products in the memory-based measure removed from the data set. The results again support our predictions with a greater number of subjects in the experimental group (29.9 percent) than in the control group (14.7 percent), indicating that they would consider buying the target products in the stimulus-based buying context ( $\chi^2(1) = 8.45, p < .004$ ).

## DISCUSSION AND FUTURE RESEARCH

Advertisers should be very encouraged by the results of this study. Our findings indicate that an advertisement has the potential to affect future buying decisions even if subjects, who are preoccupied with another task, do not process the ad attentively and, thus, do not recollect ever having seen the ad. We found that incidental ad exposure can increase the chances that a product makes it into a consideration set. Specifically, by increasing a product's likelihood of inclusion in an eight-alternative "generation set," we can infer that incidental exposure increases the chances that the product will appear in consideration sets in the real world. Notably, these effects were found in both memory-based and stimulus-based contexts where the buying situation was both familiar and unfamiliar. In addition, these results were found across two dissimilar product categories. Although this study takes an important step to further our understanding of the robustness of incidental exposure effects, additional research is needed to determine the underlying process and generalizability of our findings.

At present, our hypotheses regarding incidental exposure effects assume that a semantic analysis, leading to increased accessibility of a semantic representation, mediates the effects on memory-based consideration sets, while a feature analysis resulting in perceptual fluency mediates the effects on stimulus-based consideration sets. While both semantic and feature processing have been linked to incidental exposure (Allport et al. 1985; Di Pace et al. 1991; Fuentes and Tudela 1992; Fuentes et al. 1994), future research is needed to determine if indeed these are the processes at work or whether both types of mediators are involved with both memory-based and stimulus-based consideration set formation.

Future research also needs to focus on the generalizability of our findings. For example, previous research has indicated that incidental exposure effects persist despite a large amount of competitive interference and lengthy time delays (of up to one month), but these results have only been found when measuring the facilitation and inhibition of reaction time on same/different stimulus-based judgments using relatively simple geometric shapes (DeSchepper and Treisman 1996). Additional research is needed to determine if similar effects can be found with incidental ad exposure on stimulus-based consideration sets.

<sup>4</sup>See n. 2 above.

Evidence for the durability of semantic priming of incidental processing is less clear. Di Pace et al. (1991) found incidental semantic priming effects after 200 milliseconds but not after 2,000 milliseconds. This supported their notion that automatic, nonintentional semantic processing of parafoveal information is very short-lived. However, if semantic priming is the basis for our findings with the memory-based consideration set measures, then this priming was found to last about 10 minutes (the time between completing the processing task and beginning the memory-based consideration set measures). One factor that may account for this is that the subjects in Di Pace's et al.'s (1991) study were presented with the nonfocal information for only 120 milliseconds, whereas subjects in our study were presented with the nonfocal ad for about 10 seconds. It is possible that the longer presentation duration made the prime more durable. Future research that manipulates presentation duration and time interval between exposure and test could shed light on this issue.

## APPENDIX

### Checklist Items in the Stimulus-Based Consideration Set Measures<sup>5</sup>

Food items that you would consider buying one hour before going parachute jumping or eating dinner:

candy bar  
banana  
carrot  
cereal  
bread  
cheese  
apple  
orange  
bagel  
celery  
pretzel  
soda  
chips  
granola bar  
potato  
water  
popcorn  
cracker  
sandwich  
pancakes

A nonfood kitchen-related item that you would consider buying for a friend whose house was destroyed in a fire or to make breakfast:

pot  
eggbeater  
utensils  
spatula  
waffle iron  
blender  
microwave oven  
cappuccino maker  
coffeemaker  
toaster  
mixing bowl  
glass  
frying pan  
refrigerator  
plate  
cup  
can opener  
food processor  
range  
juicer

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<sup>5</sup>Each product alternative was depicted pictorially with a verbal label below it.

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