The Influence of a Brand Name's Association Set Size and Word Frequency on Brand Memory

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Theory that memory for brand information is enhanced by associations related to the brand name (because each association represents a possible retrieval cue) is countered by other theory that associations may cue competing concepts and so produce interference. The current research examines this issue in terms of the distinctiveness hypothesis. Results of two studies suggest that brand names composed of words encountered frequently in the language elicit nondistinctive processing, and memory for brand information is inversely related to the number of related associations. However, brand names composed of low frequency words stimulate distinctive encoding, which may eliminate or reverse the former pattern of effects.

Brand names serve a variety of purposes for both consumers and advertisers. Perhaps their simplest function is to provide labels by which firms identify and promote their products and services to consumers (Friedman 1985). However, because brand names represent the rich configurations of symbols and meanings that are embodied by products (Levy 1978), they can also take on their own meaning and presence. Through their linguistic characteristics or associations, brand names can influence the product inferences and evaluations consumers form (Peterson and Ross 1972). Moreover, firms with extremely memorable brand names (e.g., Coca-Cola, McDonalds) often regard the names as their most valuable asset because these labels provide immediate recognition and, often, acceptance of new products that may be introduced under the brand name. Thus, a critical question is, what dimensions of a brand name make it memorable?

One intuitively reasonable thesis is that brand name memorability might be enhanced when the name can be meaningfully related to many other concepts already stored in memory. In this article, the term association set refers to such groups of concepts that are meaningfully related to a target word or brand name. The logic underlying this view is that the abundant concepts associated with the brand name word provide rich networks of pathways for retrieving the name. For example, suppose a consumer was exposed for the first time to a new airline called "American." The thesis under consideration suggests that memory for this brand should be enhanced because the brand name possesses a diversity of meaningful concepts already associated with it (e.g., United States, eagle, flag, and so on). Indeed, there is considerable theoretical support for this general view (e.g., Anderson and Reder 1979; Nisbett and Ross 1980), and such theorizing has been invoked to explain a variety of phenomena observed in consumer behavior (e.g., vividness effects: Childers and Houston 1984).

Yet, another plausible line of reasoning is that brand name memorability might be inhibited if the brand name is associated with a broad network of pre-existing concepts because the target name becomes lost in a sea of associated concepts that inhibit or interfere with its retrieval. Returning to the example of the brand name "American," this view notes that due to the close semantic association between the concept "American" and "United States," consumers exposed to an ad for American Airlines might attribute the ad to United Airlines. Indeed, mounting theoretical and empirical evidence suggests that the probability of retrieving any particular concept diminishes as the association set size of the concept increases (Nelson and McEvoy 1979; see also fan effect research in Anderson 1983).

Such retrieval inhibition typically is attributed to two influences. First, as the number of associations

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linked to a brand name increases, the weaker is the presumed strength of each linkage or retrieval path because total brand name activation is dissipated over the large association set (c.f. Anderson 1976, 1983; Raaijmakers and Shiffrin 1981). And the weaker these linkages are, the more difficult it is to retrieve the brand name. Second, as the association set size increases, the number of competing associations that might be activated and interfere with brand name retrieval increases (Anderson 1976).

To reconcile these disparate views concerning the relationship between the size of a brand's association set and memory for the brand, the issue is considered in relation to the distinctiveness hypothesis. This hypothesis proposes that memory is enhanced when individuals focus on unique, contextually related connotations of concepts during processing such that the concepts are distinctively encoded (Eysenck 1979). The main contention under investigation is that memory for brand names with large versus small association sets may be inhibited when consumers are prompted to engage in nondistinctive encoding, but either the opposite outcome or no effect may occur when consumers undertake distinctive processing. In the following section, a means of operationalizing distinctiveness is offered, and the logic for the preceding predictions is developed.

ASSOCIATION SET SIZE AND DISTINCTIVENESS OF ENCODING

Substantial evidence indicates that word frequency is a viable means by which distinctiveness can be operationalized (Lockhart, Craik, and Jacoby 1976). As Eysenck (1979, p. 115) has noted, infrequently encountered or “rare words are more distinctively encoded than (are) common words.” Presumably, this occurs because infrequently used words are rather unexpected, which leads people to “struggle to find (distinctive) meaning in them” in relation to their context (Jacoby and Craik 1979, p. 11). In contrast, common words require little distinctive processing (Lockhart et al. 1976). An impressive body of research supports the view that high and low frequency words invoke different processing (e.g., Catlin 1969; Eysenck 1979; Inhoff 1984). Thus, because of the considerable evidence implying that word frequency is an appropriate way to manipulate distinctive processing, this variable will be adopted both in discussing the relationship between distinctive processing and association set size and in the research that will be reported.

A starting point in investigating the relationship between association set size and memory is Nelson’s sensory-semantic model (1979). According to this model, exposure to “a target word automatically activates its related concepts,” or association set (Nelson, Bajo, and Casanueva 1985, pp. 95, 102), and “what is activated can become part of what is encoded about the target episode.” Thus, returning to the previous example, initial exposure to the unknown brand “American” will lead to automatic activation and potential encoding of diverse meaningful associations to this brand name word.

However, the entire breadth of associations comprising the association set is not always encoded with the target word/brand name. Instead, the extent to which this occurs appears to depend on how distinctively words are processed at encoding. This thesis will be explored more fully by employing word frequency as an indicator of distinctive processing.

Association Set Size Effects When Processing High Frequency Words

High frequency words can be processed readily with little effort and, therefore, receive limited processing time (Catlin 1969; Inhoff 1984), suggesting relatively nondistinctive processing during encoding. That is, little effort is made “to integrate, specify, or restrict target (brand) information” with respect to a limited set of related concepts that distinctively and uniquely specify a particular sense of the words (Nelson, Bajo, and Casanueva 1985, p. 95). Instead, upon exposure to such words, a broad spectrum of the heterogeneous concepts comprising the association set will be activated and unselectively encoded in memory together with the target (brand) word. In turn, these diverse concepts of the association set, which later may be used as retrieval cues, are likely to cue retrieval of concepts unrelated to the brand name, interfering with brand name retrieval. Such an outcome is concordant with Nelson’s (1979, p. 49) claim that nondistinctively encoded items are “susceptible to interference from competing encodings” that may inhibit memory. This implies that interference will be more pronounced for brand names with large association sets and, hence, a greater number of diverse associations that might interfere with retrieval. Thus, when brand names consist of high frequency words, memory for brand information may be poorer for those brands with a large rather than a small association set.

Association Set Size Effects When Processing Low Frequency Words

When a brand name is a low frequency word, a different scenario evolves. Because uncommon, low frequency words are relatively difficult to encode and comprehend, they tend to induce extensive processing aimed at distinctively and meaningfully encoding the words in relation to contextual information. (For example, a consumer might relate the low frequency brand name “Ivory” to its product category shampoo and its chief attribute “appearance enhancing” by
drawing the inference that Ivory shampoo will make hair as rich and lustrous as ivory.) Thus, it is presumed that upon exposure to such low frequency words or brand names, there is initially a general activation of concepts related to the target word. However, encoding of concepts in the association set is restricted to only those items that meaningfully yet distinctively relate the word with other relevant information presented in the context (c.f. Nelson, Bajo, and Casanueva 1985). Indeed, "related concepts outside of this specific relationship are not encoded," because "the context does not draw attention to . . . other . . . attributes of the words," (Nelson and McEvoy 1988, p. 4; Nelson forthcoming). This restrictive encoding should result in the formation of strong linkages between the target word and some selected set of relevant concepts in the context or message. This implies that the breadth of associations encoded with the brand name will be limited, regardless of the size of the association set. As such, a large association set should not affect memory for brand information adversely. Indeed, it is possible that memory might be somewhat enhanced as the size of the association set increases because more associations will be available to relate meaningfully to the brand name in a distinctive manner.

HYPOTHESES

The preceding analysis suggests that the effect of association set size on the accessibility of brand information varies, depending on the degree of distinctive processing during encoding. When memory measures are sensitive to accessibility, a negative influence of association set size on memory for brand information may occur when brand names are high frequency words, but such effects might be eliminated or possibly reversed when brand names are low frequency words.

To examine this possibility, a study was conducted in which subjects were exposed to ads for a number of different fictitious brands. The brand names for some advertised brands, referred to as critical brands, varied between subjects in terms of their association set size and word frequency. Other ads were for brands possessing brand names that did not vary along these dimensions. These were merely filler ads.1 After exposure to the ads, subjects' memory for brand information was assessed by administering two memory measures, recall and recognition. As detailed later, extant research suggests that memory assessed by each of these measures may be mediated, at least in part, by different processes. Thus, examination of both measures allowed investigation of how effects of association set size and word frequency might differ, depending on how memory was measured.

These dependent measures of memory were administered after either a relatively long or short delay. This allowed the robustness of treatment effects on memory over time to be examined.2 In the following sections, specific predictions are developed for each of the memory measures. Though it seemed likely that the predicted effects would be stronger following a short rather than a long delay, all predictions were anticipated to hold regardless of variation in time delay.

Recall

Recall is thought to be sensitive to the accessibility of stimulus information or the likelihood of its retrieval (Ssrl 1981). Thus, on the basis of the analysis offered earlier, an interaction of association set size and word frequency is expected on recall of information pertinent to the critical brands:

H1: When critical brand names are high frequency words, recall of the critical brand names, their related product categories, and message information pertinent to the brands should be greater when the brand names possess small rather than large association sets.

H2: When critical brand names are low frequency words, either no relationship or a slight positive relationship will occur between the brand names' association set size and recall of the critical brand names, their related product categories, and message information pertinent to the brands.

Recognition

Different outcomes were anticipated when memory for the critical brand names was assessed via recogni-

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1Because the brand names used in filler ads were moderate on the dimensions of concern, treatment effects on recall of these names were neither predicted nor observed.

2Nelson, Bajo, and Casanueva (1985) observed that association set size effects were shortlived. However, this may have been due to any number of procedural details. For example, in Nelson et al.'s research, subjects were run individually and thus received special attention that may have enhanced motivation devoted to the tasks. In addition, the stimuli employed were simple, single words presented in a sterile context, and memory was assessed via cued recall. The simplicity of the stimuli and the aided recall may have rendered task performance a relatively easy matter, and these features raise questions about the degree to which the results are likely to generalize to consumer contexts, which tend to be more complex. The present studies were designed to emulate conditions present in most consumer settings (e.g., relatively modest consumer involvement) and to test the longevity of treatment effects under conditions more relevant to consumer behavior.

3Because previous research indicates that word frequency may be either unrelated or positively related to recall (Esyenck 1979), no main effect of this variable was predicted.
tion. Previous research suggests that effects of association set size are infrequent or very weakly observed when memory is assessed via recognition (Nelson, Cañas, and Bajo 1987). Differences in the types of cues made available at test and some mediating processes may account for this disparity between recall and recognition.

Nelson, Cañas, Casanueva, and Castaño (1985) contend that association set size effects occur only when performance of the memory task entails accessing or retrieving specific information stored in memory. Unlike recall, recognition need not invoke such a process because subjects are presented with specific brand name probes, which obviates the need for an extensive search through the association set of related concepts encoded in memory to access and retrieve the brand names. Instead, recognition judgments are often based on general feelings of familiarity (Mandler 1980). Along these lines, research by Jacoby and Dallas (1981) suggests that items will feel familiar and are recognized when probes seemingly “jump out” from the page, which may occur when the items have been recently encoded in memory.4 Because subjects in all treatment conditions of the experiment should have encoded the critical brand names quite recently, treatment effects on recognition should be absent.

H3: Recognition of the previously presented critical brand names should be similar regardless of the association set size and word frequency manipulations of the critical brand names.

The hypothesis that recognition may be based on familiarity caused by recent encoding of items leads to a different prediction for recognition of brand name imposers that are semantic associates of the critical brand names (e.g., a semantic imposter for the brand name “Dusk” might be “Twilight”). Critical brand names consisting of high frequency words should prompt nondistinctive processing such that meaningfully related associations to the critical brand names will be encoded in memory just as the brand names themselves are encoded. Thus, when these critical brand names possess a large rather than a small association set, brand name imposers that are semantically related to the brand names may be mistakenly recognized as “old” because they are among the large group of associations recently encoded with the critical brand names.

When critical brand names consist of low frequency words, the distinctive processing induced should result in the encoding of only those associations that distinctively relate the brand with the context. Thus, regardless of these brand names’ association set size, false recognition of semantic impostors for the critical brand names should be low. The following summarizes the anticipated interaction between association set size and word frequency on recognition of these brand name imposters:

H4: When critical brand names are high frequency words, accurate recognition (i.e., rejection) of brand name imposers that are semantically associated with the critical brand names should be greater when these brand names possess a small rather than a large association set.

H5: When critical brand names are low frequency words, accurate recognition (i.e., rejection) of brand name imposers that are semantically associated with the critical brand names should be relatively unaffected by whether the critical brand names possess a small or large association set.

**EXPERIMENT 1**

Stimuli

Ads for eight fictitious toiletry products were constructed by combining copy claims obtained from existing ads. The product categories antiperspirant, blemish medicine, and disposable razor were selected randomly from a pool of toiletry product categories for use in ads for the critical brands. Ads for the filler brands pertained to the categories pain reliever, vitamins, soap, suntan lotion, and bandages. The ads developed for the critical brands were equated for length (64–66 words), while the length of filler ads varied (36–83 words). Further, in each of the critical brand ads, copy was structured in an identical manner such that the brand name and product category were identified in the first, third, and last (fifth) sentences of the text. A similar structure was employed in developing the ads for the filler brands except that the brand name and category were identified only twice in the shorter filler ads.

Words employed as brand names for critical products were determined on the basis of both their association set size and their frequency of occurrence in the English language. The brand names employed were selected from words with known association set sizes as determined in the research of Nelson and colleagues (e.g., Nelson, Bajo, and Casanueva 1985; Nelson and McEvoy 1979). In Nelson’s research, word

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4This is not to suggest that recognition will never be mediated by an extensive memory search that entails accessing specific information from memory. Rather, as numerous theorists propose (Jacoby and Dallas 1981; Reder 1987), such rather effortful search processes tend to play a lesser role or to be bypassed entirely in favor of simpler processes available for use at recognition. Moreover, the proposition that items will be recognized if they have been encoded recently is offered ceteris paribus. Other factors, such as the number of foils presented and the similarity of foils to targets, also may influence recognition accuracy. In the current research, attempts were made to hold these other factors constant across treatments.
set sizes were obtained by asking large numbers of individuals to specify the first meaningfully related association that came to mind upon hearing certain target words. Word set sizes were then derived by tallying the total number of different responses offered by at least two individuals. The frequency of these words' occurrence in the English language was assessed and cross-verified by employing word usage estimates provided in Thorndike and Lorge (1944) and Kucera and Francis (1967). Words were selected for use as critical brand names in the present study only if (1) the size of their association set was either small or large (mean association set size for the words chosen was 5.83 and 19, respectively); (2) the frequency of word occurrence was clearly low or high (low = 15 or fewer occurrences and high = 100 or more occurrences per one million words); and (3) the words did not convey highly negative or unusual connotations in the context of a consumer product.

Employing these criteria, the three words selected for critical brand name use in each condition fulfilled the word frequency (low/high) and association set size (small/large) requirements. Yard, Lake, and Room were high frequency/large set size brand names; Cloud, Day, and Round were high frequency/small set size names; Crisp, Moose, and Bribe were low frequency/large set size names; and Cork, Shove, and Dusk were low frequency/small set size names. Three words were employed to represent each critical brand name treatment condition to reduce the likelihood that any treatment effects would be due to unique content embodied by a particular brand name word. Brand names selected for filler ads, which were relatively moderate on the critical treatment dimensions (i.e., word frequency estimates ranging between 37 and 43), included Arise, Friday, Swift, Comment, and Incline. Pretests conducted among 15 individuals indicated the absence of significant differences between all relevant treatments in the case with which sets of words could be imaged and in the extent to which relationships were perceived between the selected words and their product categories.

Further, an experiment was conducted to provide an independent assessment of the thesis that low frequency words are more distinctive relative to high frequency words and, thus, are more likely to stimulate distinctive processing. In this study, 15 people received a complete list of the words used for the critical brand names and rated the extent to which they felt each word was distinctive relative to other words they might encounter in the language (1 = not at all distinctive, 7 = extremely distinctive). Subjects' ratings supported the view that low frequency words are more likely to induce distinctive processing than are high frequency words ($\bar{X} = 4.07$ and 2.59, respectively; $t = -11.14, p < 0.001$).

Procedure

One hundred females participated in the study. They did so in groups and were paid $5 to compensate them for their time.

At the outset of the study, subjects were informed that they would be listening to a series of ads for existing, regionally distributed products. Because the ads purportedly were under test for use on radio, they featured only the text or message portion of the ads. In listening to the ads, subjects were instructed to consider overall how clearly articulated, grammatically correct, and professionally written the ads were. Given the global nature of such instructions, it seemed unlikely that subjects would be highly involved in the listening task or engage in substantial elaboration of the ads' content. No mention was made of the memory tasks to be administered later.

Subjects then listened to a series of radio ads that had been tape-recorded at a uniform volume and speed in a studio for use in the study. One short filler ad was repeated three times on the tape, two filler ads were repeated twice, and two other filler ads were presented only once. The three critical ads were presented once each and aired in the fourth, seventh, and tenth positions on the tape. Thus, in total, subjects received 12 consecutively presented ad exposures that included eight different ads. The logic underlying the repetition of some of the filler ads was twofold. First, this procedure should increase the complexity of the listening context, thereby reducing the likelihood that ceiling effects would obscure treatment effects on memory for the critical ads. Second, if subjects engaged in hypothesis-guessing, they were likely to mistakenly reason that the repeated filler ads were of focal concern. Thus, they would be unlikely to devote substantial attention to the critical ads.

After listening to the ads, subjects completed, at their own pace, booklets that contained the dependent measures. All subjects first completed measures that entailed rating the ads with regard to their clarity, grammar, professional writing style, and so on. This task was included to uphold the study guise and to eliminate short-term memory effects. Treatment effects on these measures were neither anticipated nor observed. Half of the subjects then were assigned randomly to what shall be referred to as the long delay condition and completed a 20-minute filler task before they were administered the memory measures. This filler task consisted of a variety of opinion questions not pertinent to the current study. Subjects remaining in what is called the short delay condition completed the memory measures before the filler task.

Subjects completed the free recall measure first. They were asked to write down as completely as possi-

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5This experiment was motivated by reviewers' feedback and was conducted after Experiment 1 but before Experiment 2.


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Recall of the critical brand names revealed the anticipated interaction of association set size by word frequency \((F(1,92) = 7.26, p < 0.01, \omega^2 = 0.06)\). No other effects were significant, including those involving the delay factor. As predicted by Hypotheses 1 and 2, when the critical brand names were high frequency words, recall of these names was greater if the association set size of the brand names was small rather than large \((F(1,92) = 13.22, p < 0.001)\), but when these critical brand names were low frequency words, recall of the critical brand names was similar regardless of association set size \((F < 1)\).  

Analysis of recall of the critical product categories also revealed the predicted interaction of association set size by word frequency \((F(1,92) = 6.55, p < 0.01, \omega^2 = 0.05)\). All other effects were nonsignificant. Consistent with Hypotheses 1 and 2, when the critical brand names were high frequency words, recall of the critical product categories was greater if the association set size of the critical brand names was small rather than large \((F(1,92) = 5.65, p < 0.05)\). When the critical brand names were low frequency words, recall was invariant to association set size \((p > 0.15)\), but directionally greater when the association set size of the critical brand names was large rather than small.  

The interaction of association set size and word frequency also was significant for recall of message phrases from the critical brand ads \((F(1,92) = 6.11, p < 0.05, \omega^2 = 0.05)\). No other effects were significant. As predicted by Hypotheses 1 and 2, when the critical brand names were high frequency words, recall of message phrases was greater if the association set size of the brand names was small rather than large \((F(1,92) = 7.60, p < 0.01)\), but when the critical brand names were low frequency words, recall of the message phrases was similar regardless of association set size \((F < 1)\).  

Recognition  

Recognition performance was analyzed for accurate recognition of the names of the three critical brands and accurate rejection of the six imposters that were semantically related to the critical brand names. Accurate responses received a score of 1 while inaccurate responses received a score of 0. Analyses were conducted on the sum of critical brand names’ product categories, and message phrases related to these brands. Specifically, recall of such items was predicted to be negatively related to association set size when the critical brand names were high frequency words; either no relationship or a slight positive relationship was anticipated when the brand names were low frequency words.

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6 Analyses that treated brand name words as a random factor in the design revealed no effect of this factor, suggesting that the results are reliable regardless of the particular words used.
accurately recognized and the sum of imposters accurately rejected (see Table 1 for treatment means).

As predicted by Hypothesis 3, treatment effects were absent on recognition of the critical brand names \( (F < 1). \) However, an interaction of association set size by word frequency \( (F(1,92) = 2.56, p < 0.05, \omega^2 = 0.04) \) emerged on recognition of the six imposter items. No other effects were significant. When the critical brand names were high frequency words, accurate recognition (i.e., rejection) of the semantic imposters was greater if the association set size of the critical brand names was small rather than large \( (F(1,92) = 7.41, p < 0.01), \) but when the critical brand names were low frequency words, accurate recognition (rejection) of the semantic imposters was similar regardless of the association set size of the critical brand names \( (F < 1). \) These outcomes support Hypotheses 4 and 5.

**DISCUSSION**

Data obtained on the recall and recognition measures from this study suggest that the association set size and word frequency of brand names can jointly influence memory for the brand names, categories, and message information. Moreover, these effects held whether memory was assessed immediately or after a 20-minute delay.

The findings are consistent with the proposed process by which association set size and word frequency characteristics of brand names are thought to influence memory. As suggested by extant research (Eysenck 1979), the word frequency of brand names appears to influence how distinctively brand name words are processed. High frequency words encourage relatively nondistinctive processing because a diversity of related concepts are automatically activated upon exposure to the brand names/words, and these are encoded in memory along with the brand names. As a result, memory for information pertinent to such brands is likely to be impaired when these brand names possess a relatively large versus a small association set, since the larger set of associations apparently inhibits or interferes with the accessibility and, thus, the retrieval of brand information.

By contrast, low frequency brand name words encourage more distinctive processing of the associations tied to the word. And regardless of the brand names' association set size, encoding is restricted to only those associations that distinctively relate the brand name words with other information known about the brands. Because only a restricted number of associations connect the brand with the context, retrieval is unlikely to be inhibited by extraneous concepts that have been encoded in memory. Thus, memory for brand information tends to be relatively unaffected by association set size in this instance.

The study findings are compatible with the view that brand names' association set size and word frequency affect the accessibility or ease of retrieving brand information. And because the memory search processes presumably mediating recall are sensitive to such accessibility, the pattern of effects outlined obtained on recall. The findings also are consistent with the view that, in part, different processes that are relatively insensitive to information accessibility may mediate recognition. Indeed, recognition may be based on general feelings of item familiarity, which may reflect simply the extent to which the content of memory probes has been recently encoded. Thus, presumably because the critical brand names had been encoded recently in all treatment conditions, treatment effects were absent on critical brand name recognition. Semantic associates of these brand names were presumed to have been encoded more frequently in the high frequency/large association set size condition than in the other conditions, and false recognition of imposter probes evidenced the predicted pattern of treatment effects.

In summary, then, Experiment 1 suggests that the predicted treatment effects obtain and persist for at least 20 minutes. Yet, in typical consumer behavior settings considerably more lengthy delays occur between ad exposure and recall. Thus, it would be of interest to examine whether treatment effects on memory for brand material may endure over longer periods. Accordingly, a second study was conducted that assessed consumers' memory for brand information after a 24-hour delay.

The introduction of a 24-hour delay, however, posed a methodological dilemma. It is well established in advertising and memory research that memory greatly deteriorates over time (Leckebush and Wedding 1982). Thus, after a 24-hour delay, recall in general may be so poor that floor effects are likely to obscure detection of any treatment effects. Because of this problem, it was necessary to enact procedural changes in Experiment 2 that would provide subjects with the opportunity to elaborate on the brand information at encoding. In turn, this might facilitate subjects' access to brand information at recall for a fairer test of the predictions under these more stringent conditions.

**EXPERIMENT 2**

**Method**

Seventy-nine members of a sorority agreed to participate in two purportedly unrelated studies held 24
hours apart on consecutive evenings. The sorority received $10 for each individual who participated in both sessions.

Stimuli employed were the same as in Experiment 1. All subjects were exposed to tape-recorded ads for a variety of products, and among these were three critical ads for products with brand names that varied in association set size (small/large) and word frequency (low/high).

Upon reporting for the first session, all subjects received the same instructions as in Experiment 1. Hence, subjects were not alerted that their memory for the ads would be tested. The rest of the procedure was modified, however, to vary the extent to which subjects would be likely to elaborate on the ads and, thus, have reasonable access to the ads’ contents after a 24-hour delay. Half of the subjects were assigned to a one-exposure condition and heard the tape-recorded ads only once. They then rated the ads in terms of clarity, grammar, professional writing style, and so on, listed whatever thoughts had crossed their mind as they listened to the ads, and were dismissed. Because subjects in this condition heard the ads only once and likely engaged in limited elaboration of the ads’ contents, it was expected that their access to and retrieval of the brand information would be somewhat attenuated. Thus, treatment effects on these subjects’ memory might be similar to those observed in Experiment 1, but relatively weak.

The remaining subjects were assigned to the three-exposure condition and listened to the tape three times. On the third exposure, they were encouraged to follow along on written scripts of the ads’ copy that were provided. It was explained that subjects were listening to the taped ads multiple times because “people’s judgments about ads often change after they hear ads more than once.” After the first and second exposures, subjects rated the ads in terms of their clarity, grammar, and so on. After the third exposure, subjects recorded whatever thoughts had crossed their minds as they listened to the ads and were dismissed. Because subjects in this condition had multiple exposures to the ads and presumably engaged in greater elaboration of ad content, they were anticipated to have reasonable access to brand information during the memory tasks. Thus, treatment effects on these subjects’ memory should parallel those observed in Experiment 1 and be relatively pronounced.

All subjects followed a common procedure when they reported back 24 hours later. First, they performed a free recall task. Then, recognition of the product categories associated with the ads and cued recall of the brand names were assessed. Recognition entailed presenting subjects with a list of product categories, all for toiletry products. Three of the product categories were the ones associated with the critical brands presented in the first session, and eight categories were imposter categories not previously presented. For each category, subjects were instructed first to indicate whether or not they had heard an ad for a product of that type in the first session. They did this by circling “yes” or “no” on the response sheet next to each category. Then, to assess cued recall, subjects were asked to write down for each of their “yes” responses the name of the brand they had heard advertised for that type of product. Thus, subjects’ recall of the brand names was cued by presentation of the product categories.

Results

Data analysis was performed on the full 2 (small/large association set size) \( \times 2 \) (low/high word frequency) \( \times 2 \) (one/three exposures) between-subjects factorial design. Treatment means for each of the measures discussed are shown in Table 2, and all significant effects on these measures are reported in this section.

The major findings on free recall of the critical brand names, their product categories, and their message phrases were similar to those observed in Experiment 1. A main effect of ad exposure occurred on recall of the critical brand names \((F(1,171) = 4.80, \ p < 0.05, \ \omega^2 = 0.04)\) and revealed that memory for the critical brand names was higher in the three-exposure than the one-exposure condition. In addition, main effects of association set size emerged on recall of the critical brand names \((F(1,171) = 11.04, \ p < 0.001, \ \omega^2\)
and the brands’ categories \( (F(1,71) = 4.48, p < 0.05, \omega^2 = 0.04) \). Memory for these items was greater when the critical brand names possessed small rather than large association sets.

More germane to the current concerns, however, is the interaction of association set size and word frequency that emerged on recall of the critical brand names \( (F(1,71) = 5.67, p < 0.05, \omega^2 = 0.05) \) and recall of the critical brands’ product categories \( (F(1,71) = 4.63, p < 0.05, \omega^2 = 0.04) \). Although this interaction did not achieve significance on recall of message phrases from the critical brand ads \( (p < 0.15) \), the data followed the expected pattern. Consistent with Hypotheses 1 and 2, when the critical brand names were high frequency words, recall of the critical brand names, the brands’ product categories, and the brands’ message phrases was greater when the association set size of the brand names was small rather than large \( (F(1,71) = 15.89, p < 0.001; F(1,71) = 8.83, p < 0.01; F(1,71) = 3.09, p < 0.10, respectively) \). But when the critical brand names were low frequency words, recall of each of these items was similar regardless of the brand names’ association set size \( (F < 1) \). Moreover, these outcomes were maintained when these simple effect tests were performed separately on data from the one- and the three-exposure conditions.

Treatment effects on product category recognition and cued recall also generally conformed with expectations. Recognition of the product categories for both the critical brand ads and the imposter categories revealed no significant effects \( (F < 1.09) \). However, treatment effects on cued recall of the critical brand names paralleled those observed on the free recall task. Specifically, the cued recall measure exhibited main effects of ad exposure \( (F(1,70) = 11.11, p < 0.001, \omega^2 = 0.10) \), association set size \( (F(1,70) = 7.28, p < 0.01, \omega^2 = 0.06) \), and the interaction of association set size and word frequency \( (F(1,70) = 5.27, p < 0.05, \omega^2 = 0.04) \). Consistent with Hypotheses 1 and 2, when the critical brand names were high frequency words, cued recall of the critical brand names was greater if the association set size of the brand names was small rather than large \( (F(1,70) = 11.97, p < 0.001) \), but when the critical brand names were low frequency words, such recall was equivalent regardless of association set size \( (F < 1) \). Again, these outcomes held in separate analyses of the one- and the three-exposure conditions.

Finally, to assess the extent to which treatment effects reflect the distinctive encoding of the critical brand names in relation to their categories, the number of such brand names that were generated at cued recall and paired with their correct product category was examined. This measure revealed a main effect of word frequency \( (F(1,70) = 4.50, p < 0.05, \omega^2 = 0.04) \) that was qualified by an interaction of association set size and word frequency \( (F(1,70) = 4.87, p < 0.05, \omega^2 = 0.04) \). Further examination of this interaction revealed that when critical brand names were high frequency words, a greater number of critical brand names were correctly paired with their categories when the association set size of the brand names was small rather than large \( (F(1,70) = 6.42, p < 0.01) \). When the critical brand names were low frequency words, the number of correct pairings was similar regardless of association set size \( (F < 1) \). These outcomes were maintained in separate analyses of the one- and the three-exposure conditions.

**GENERAL DISCUSSION**

The findings from Experiment 2 generally replicate those obtained in Experiment 1, suggesting that, in accordance with predictions, when brand names consist of high frequency words, information relevant to the brand is better remembered when the sets of associations tied to the brand names are small rather than large. But when brand names are words low in frequency, memory for material concerning the brands is relatively insensitive to the association set size. The observation that these effects appear to be relatively enduring and hold for each of the exposure conditions suggests that the data are relevant to consumer research.

The findings of the present study both dovetail and amplify previous brand name research. For example, the current findings are generally consistent with assertions made by Saegert and Young (1983), who considered the issue of brand name memory from a perspective highly related to the current one—depth of processing (Eysenck 1979). They note that “recall of brand names is a function of the degree to which viewers pay attention to the semantic features of the brand names they encounter” (Saegert and Young 1983, p. 131). The current research expands upon this view by specifying how two features of brand names, their word frequency and association set size, bear upon the relationship between brand name recall and the extent to which brand names are processed in a relatively distinctive or “deep” semantic fashion.

Though research by Lutz and Lutz (1977) examined the influence on brand name memory of factors quite different than those investigated in the current study, the findings they obtained can be viewed in terms of the current framework. These researchers found that brand names that were interactively rather than noninteractively associated with corresponding images were more memorable. This finding seems to demonstrate a premise that underlies the current research. The assertion is that memory for a brand name will be enhanced when a distinctive and unique meaning can be established that connects the brand name with preexisting associations to the brand name word. Thus, it would seem that in the Lutz and Lutz research, memory for brand names was enhanced in
the interactive name/picture condition because subjects could more readily generate distinctive and unique ties between the brand names and the images.

Before concluding, it seems appropriate to identify some of the limitations of the current research. The present research examines only how a brand name's word frequency and association set size may influence brand memory. In practice, however, a myriad of other factors also may affect memory. Thus, it may be that the reported treatment effects will disappear when a strong semantic relationship exists between the brand name and its category, when strong imagery is associated with a brand name, and so on. It remains the task of future research to explore whether and how these factors may influence the current findings. Moreover, it seems advisable that the boundary conditions of the reported findings be more fully investigated. Along these lines, it remains uncertain whether the current effects will generalize when an orienting task is manipulated, when processing conditions are extremely uninvoking, when ads are presented in a medium that allows consumers to selfpace message processing (e.g., ad presentation in print form), and so on. It also would seem useful to explore the robustness of the findings when new sets of brand name words are used and/or when other ways of inducing distinctive processing are employed.

Despite these limitations, the current work appears to contribute to the extant literature in at least three important ways. First, it offers a means of reconciling the two streams of theory identified at the outset of this article that imply opposing outcomes concerning the effects of association set size on memory. Second, the current work offers a plausible explanation for why consumers often exhibit quite different levels of memory for products that seem to be exceedingly similar in all respects except for their brand names. It may be that differences in the association set size and word frequency characteristics of the brand names themselves account for differences in consumers' memory for the brands. For example, Jif and Peter Pan are major brands of peanut butter with equivalent attributes, but most consumers exhibit better top-of-mind awareness and recall for Jif than for Peter Pan. Perhaps the high word frequency and seemingly large association set size of the brand name Peter Pan contributes to this name's impaired memorability, while the opposing characteristics of Jif account for consumers' superior memory of this brand.

Possibly the major contribution of the current research to consumer behavior is that it suggests how sensitivity to the influences of brand name association set size and word frequency may vary, depending on the conditions prevailing when memory is assessed. These may affect the processes invoked. For example, effects of association set size and word frequency are likely to be manifested when consumers attempt free recall of brands, as might occur when purchases are being planned outside of the store (Bettman 1979). But when memory attempts take place in-store and consumers are confronted with a brand recognition task, these effects may be absent, unless the store also features competitive brands with brand names that are semantic associates of the focal brand.

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