



ELSEVIER

Intern. J. of Research in Marketing 18 (2001) 191–202

International Journal of

**Research in
Marketing**

www.elsevier.com/locate/ijresmar

Category structure, brand recall, and choice

Prakash Nedungadi^a, Amitava Chattopadhyay^{b,*},¹, A.V. Muthukrishnan^c

^a *School of Business, Indiana University, USA*

^b *INSEAD, Boulevard de Constance, 77305 Fontainebleau Cedex, France*

^c *Department of Marketing, Hong Kong University of Science and Technology, Hong Kong, People's Republic of China*

Received 1 March 2000; accepted 1 December 2000

This paper is dedicated to the memory of our friend, classmate, co-author, and colleague the late professor Prakash Nedungadi.

Abstract

Most marketing discussions of product-markets and competitive positioning implicitly assume that consumers are aware of product category structures. In the present research, we examine this assumption and show how the provision of structure can improve the quality of consumer decisions. The results of the first study suggest that provision of structure increases brand recall and decreases inhibitory effects of part-set cues. In a second study, we show that these positive effects on recall carry over to brand choice, in a memory-based decision. Consumers are able to make choices that are consistent with their preferences when they use an existing category structure to retrieve product information. © 2001 Elsevier Science B.V. All rights reserved.

Keywords: Category structure; Recall; Choice

1. Introduction

The concept of product category structure has been of interest to researchers for a number of reasons. From the practitioners' perspective, the ability to divide markets into subgroups based on category structure facilitates a more thorough and accurate analysis of competition and competitive advantage (e.g., Weitz and Wensley, 1988; Day et al.,

1979). Positioning of a brand vis-à-vis its competitors follows the marketer's analyses of prevailing structures in the product category. While devising these positioning strategies, marketers often are guided by an implicit assumption that consumers possess some knowledge of the product category structures and may use this knowledge in brand choice. However, research in consumer behavior suggests that even in familiar product categories, consumers may not either possess such knowledge or use this knowledge to guide brand recall and choice. For instance, consumers ignore entire subcategories of brands within a particular product category (e.g., Alba and Chattopadhyay, 1985), and subtle primers or reminders have led consumers to choose from subcategories that they otherwise failed to recall (Nedungadi, 1990). The present research builds on

* Corresponding author. Tel.: +33-1-60-72-4334; fax: +33-1-60-74-5500/5501.

E-mail address: amitava.chattopadhyay@insead.fr (A. Chattopadhyay).

¹ The L'Oreal Chaired Professor in Marketing-Innovation and Creativity.

and extends the work of Alba and Chattopadhyay (1985, 1986) and Nedungadi (1990).

For a number of reasons, consumers may not be able to make effective use of category structure information at choice. In some instances, consumers may either possess no structure at all or quite a superficial and not rich enough structure to be of much use during retrieval. This is likely in product categories with which consumers have little expertise (Alba and Hutchinson, 1987). In other cases, although consumers may possess a well-differentiated category structure, it may not be utilized at choice. This is most likely to be the case for frequently purchased product categories in familiar choice situations. In these cases, familiarity with the product class and purchase situation is likely to have led to a fairly well developed category structure. However, although it may be beneficial to the consumer to access category information, the consumer may not be able to do so. For example, for years the sales of Sprite languished, even though it was a well-liked drink among target consumers. When Coca Cola realized that this was because it was positioned in the lemon-lime subcategory, a minor subcategory that consumers often failed to recall, Sprite was repositioned simply as a soda (superordinate and major category) with a lemon-lime flavor, and its sales increased dramatically (Zyman, 1999).

This last retrieval context is the focus of our paper. As the example above suggests, consumers may habitually buy from a particular set of salient subcategories (e.g., “Colas”). The salience of these categories may inhibit the recall of competing subcategories (e.g., “Lemon Lime”). Because these latter subcategories may not be salient enough, brands in the subcategories (e.g., “Sprite”) may not be retrieved or considered for choice (Nedungadi, 1990). In such instances, methods that activate category structure and make it salient should facilitate brand recall, consideration, and choice.

We propose that, in a memory-based choice in which not all the options are available in front of the consumer (Lynch and Srull, 1982), priming category structure will improve consumer’s ability to retrieve brands, leading to a choice within the category that is consistent with the consumer’s evaluation. The remainder of this paper is organized around tests of this proposition.

2. Hypotheses development

2.1. The role of category structure in retrieval

Product category structures function to distinguish brands in ways that are useful for subsequent decision making (Cohen and Basu, 1987; Smith and Medin, 1981). The categorization of brands results in organizing brand information into groups, or subcategories. For instance, one of the ways in which information about brand names (e.g., “McDonald’s”, “Pizza Hut”) in a product class (Fast-food Outlets) may be structured is by organizing the information into product subcategories (e.g., Burger places, Pizza places).²

A number of studies have shown that the use of some type of structure during retrieval enhances information accessibility (see Tulving and Pearlstone, 1966). Category structure can function as an organized retrieval plan (Raaijmakers and Shiffrin, 1981) and can provide a number of retrieval cues, which provide access to subcategories and, thus, facilitate recall of member brands (Alba and Hutchinson, 1987).

2.1.1. Category structure and subcategory retrieval

Since the direct effect of availability of category structure is to activate various subcategories within the product class, the activation of subcategory nodes is likely to provide access to *otherwise inaccessible* subcategories. Thus, availability of structure should lead to an increase in the number of subcategories from within which brands are recalled (Alba and Chattopadhyay, 1985). However, highly salient or *major* subcategories will be accessed even in the absence of any category structure (e.g., “Colas”). As a result, the facilitatory effects of category structure should be stronger for the less salient or minor subcategories within a product class (e.g., “Lemon Lime”). Facilitating access to subcategories will lead

² Product categories may be organized around product subgroups, around attributes (e.g., close-by), or around other types of information such as use occasion (e.g., good for lunch). The most commonly investigated form of category structure, and the focus of this paper, is the organization of brands around or within subgroups or subcategories.

to an increase in the total number of brands recalled. This logic suggests that the provision of category structure will have a stronger effect on retrieval of brands from minor subcategories. Thus, we hypothesize:

H1. Provision of category structure leads to an increase in the number of subcategories accessed. This is primarily due to an increase in the number of minor subcategories accessed.

H2. As a consequence of the effect proposed in H1, provision of category structure also increases the total number of brands recalled from the product category.

2.1.2. *Category structure and the effect of part-set cues*

Research on the retrieval of categorized information has shown that the provision of some of the items within a set as cues (for example, a few members of a product subcategory) can inhibit retrieval of the other items within the set (e.g., Alba and Chattopadhyay, 1985, 1986). For example, the provision of a subset of shampoo brands as cues may actually inhibit recall of additional brands of shampoos (Alba and Chattopadhyay, 1985). In the memory literature, this effect is known as the “part-set or part-category cuing effect” (Alba and Chattopadhyay, 1985; Nickerson, 1984). Alba and Chattopadhyay (1985) also found that provision of brands from one subcategory or product class inhibited the recall of brands from other subcategories. We add an important qualifier to this effect. Because the provision of category structure allows for increased access to subcategories and also provides a hierarchically organized retrieval path (Raaijmakers and Shiffrin, 1981), the inhibitory effects of part-set cues on brand retrieval should weaken when category structures are provided.

There is some indirect evidence for this proposition. In the product category of shampoos, Alba and Chattopadhyay (1985, Experiment 2) found that males were negatively influenced by the provision of part-set cues, whereas for females no inhibition was found. They attributed this unexpected finding to the fact that females were more familiar with and, thus,

presumably possessed a richer category structure for the product category of shampoos (see also Alba et al., 1991). We test this hypothesis directly.

H3. Compared to instances in which the category structures are not provided, part-set cues will have less of an inhibitory effect on the retrieval of both minor and major subcategories.

These three hypotheses were tested in Experiment 1.

2.1.3. *Category structure and choice–evaluation consistency*

Nedungadi (1990) investigated the process by which consideration sets (a smaller number of alternatives out of which one or more brands are eventually chosen) are formed. He found that memory for a brand at the time of choice enhances the likelihood of the brand being included in the consideration set and, therefore, the probability of the brand being chosen. If the provision of category structure enhances the probability of well-liked brands from subcategories which would not have been accessible otherwise to be recalled, then we would expect a greater consistency between attitude and choice when category structure is provided, as it increases the accessibility of alternatives and, therefore, the likelihood of a more preferred option being accessible at the time of decision making. The positive impact of category structure cues, on retrieval and, therefore, on the consistency between attitude and choice, is contingent on the individual possessing a category structure within which the to-be-retrieved information is organized (Tulving and Pearlstone, 1966). Thus, we offer the following hypothesis that is tested in Experiment 2.

H4. Greater consistency between evaluation and choice occurs when the brand information that consumers possess is already organized in a category structure *and* category structure is provided at the time of making a decision.

3. Experiment 1

This study is designed to test the effects of providing category structure on brand retrieval (i) under

normal retrieval conditions, and (ii) when part-set cues are provided to subjects.

3.1. Method

3.1.1. Design

A 2 (Recall Task) \times 2 (Structure Prime) \times 3 (Product Class) mixed factorial design was used in this study. While product class was a within-subjects factor, the other two were between-subjects factors. The recall task was either uncued or cued, and subcategory structure was either provided or not provided prior to recall. In addition, the recall task was replicated across three separate product classes.

3.1.2. Subjects

Seventy-one subjects participated in this experiment. Subjects were students at a large northeastern university in the United States. They were recruited from various undergraduate classes and were paid US\$6 for their participation. Subjects were randomly assigned to the experimental conditions.

3.1.3. Stimuli

The three product classes of Magazines, Fast-food Outlets, and Carbonated Sodas served as stimuli. These categories were chosen based on a pretest that indicated that they were familiar to the student subjects and had a well-defined subcategory structure.³

3.1.4. Procedure

Subjects were run in small groups of three to five. They were told that they would perform a number of tasks that were designed to test their knowledge of certain product categories. For all subjects, Candy bar was used as a “practice” category. That is, each task was run on the Candy bar category before any

of the other three categories of interest. Order of presentation of the three target product categories was randomized across subjects.

After introductory remarks, the structure manipulation was administered as described in the next section. Subjects in the structure condition received information about various subcategories and then completed the recall task. Subjects in the no structure condition proceeded directly to the recall task. The cue manipulation was then administered as described below. Finally, subjects completed the grouping task, were debriefed, and dismissed with instructions not to discuss the study with anybody for the next few weeks.

3.1.5. Manipulations

There were two independent variables of theoretical interest in this study: structure (no structure provided, structure provided) and recall task (cued, not cued).⁴ Subjects in the structure-provided condition received the names of specific subcategories in the product class. Subjects were first motivated to think about the structure by being told that, “Very often as consumers, when we think of a product class, we tend to think of specific groups, or categories within the product class” and were then given examples of likely groups in two unrelated product classes (Coffee and Cars). Subsequently, subjects in the structure-provided condition were given a list of subcategories in each of the three product categories. These categories were identified via pretests.⁵ Subjects were given two minutes to scrutinize each of the three lists of Magazines, Fast-food Outlets, and Carbonated Sodas.

³ Student subjects similar to those in the experiment were asked to rate a series of product categories in terms of familiarity (7-point scale). Subsequently, a fresh set of subjects were asked to list all the brands they could think of from each of the product categories that received a mean rating of 6 or greater in the rating task. Following recall, subjects categorized the brands from each category into groups on the basis of similarity. The three categories chosen had a high degree of consistency in the subcategory structure used.

⁴ Product replicate, the third factor in this study, was not of theoretical interest, but was included to explore the generalizability of the results.

⁵ A sample of student subjects similar to those in the study was given a list of brands from each of the categories. The list encompassed all the brands that were available in the local market. The brands were listed individually on index cards. Subjects were asked to sort the brands into piles such that brands that were similar to each other were in the same pile and dissimilar brands were in different piles. The subjects then labelled the piles. The subcategories used by at least 20% of the pretest subjects were used as the category structure manipulation.

The brand recall task was either cued (with part-set cues) or uncued. Subjects in the cued condition were told that they would be given some “clues” to assist them during recall. Just prior to recall from each product category, subjects were given one page containing a number of familiar brand names, randomly spread on the page. Along with these names were interspersed the names of three brands in the product category of interest. Subjects were asked to identify and circle the names of the three brands that belonged in that specific product category. To ensure that the subject had identified and been cued by the relevant brands, the names of the three brands were again repeated at the bottom of the page, ostensibly to allow subjects to check their accuracy of identification. For each product category, the three brands chosen, as part-set cues, were those that pretests identified as the three most salient members (e.g., Time, Newsweek, Life) of the major or most salient subcategory (e.g., News Magazines) in the product category.

3.1.6. *Dependent variables*

The key dependent variable was brand name recall from specific product categories. Subjects were given three minutes to list all the brand names they could think of in a particular product category. They were told to keep trying to retrieve brand names until asked to stop. Once subjects had completed the recall task in all three categories, they proceeded to a grouping task. In this task, they were required to assign all retrieved brands into groups, on the basis of similarity, and then to label each group.

The grouping task done by each subject following recall was used to compute the number of subcategories accessed by that subject. Subjects were given credit for recalling a subcategory if they listed at

least one brand from it. All subjects were given credit for recalling the category to which the cued brands belonged. Subcategories were classified as major or minor based on the instances of their recall in the control group. A subcategory was labeled as major if at least two-thirds of the subjects had accessed it. Those subcategories that had been retrieved less frequently were labeled as minor subcategories. In order to avoid responses that were unique to certain subjects, only subcategories that were mentioned by at least 20% of the subjects were classified as either major or minor. There were between two and five major and minor subcategories in each product category. For example, for the category of magazines, there were four major subcategories (fashion, news, sports, and pornographic) and three minor subcategories (business, geography, and science). The number of these (major and minor) subcategories accessed by each subject was then computed for each product class.

Because provision of cues prior to recall reduces the set of remaining items that can be retrieved, the dependent measure for brand recall was the total number of noncued items recalled by each subject (Alba and Chattopadhyay, 1985). The mean number of brands recalled per accessed subcategory was computed by dividing the number of brands recalled from each product category by the number of subcategories accessed.

3.2. *Results*

Three dependent variables were constructed from the data provided by the subjects: number of subcategories accessed, number of major and minor subcategories accessed, and the total number of brands recalled. Data pertaining to recall of subcategories

Table 1
Experiment 1: subcategory recall across experimental conditions (standard deviations in parentheses)

	No cues				Part-set cues			
	Total category	Major subcategory	Minor subcategory	Other subcategory	Total category	Major subcategory	Minor subcategory	Other subcategory
No structure	6.4 (2.17)	3.7	1.1	1.6	5.6 (1.62)	3.3	0.7	1.6
Structure	7.2 (1.77)	3.7	1.5	2.0	6.8 (1.67)	3.8	1.4	1.6

Table 2

Experiment 1: brand recall across experimental conditions (standard deviations in parentheses)

	No cues		Part-set cues	
	Total brands recalled	Brands per subcategory	Total brands recalled	Brands per subcategory
No structure	12.7 (4.9)	2.0	10.8 (4.5)	1.9
Structure primed	14.4 (5.7)	2.0	13.3 (4.5)	2.0

are presented in Table 1, and data on brand recall are presented in Table 2.⁶

3.2.1. Test of H1

According to H1, the provision of category structure leads to increased accessibility of a greater number of subcategories. We submitted data on the total number of subcategories retrieved to a structure \times cue between-subjects ANOVA. The analysis revealed a main effect of structure ($F_{1,209} = 14.79$, $p < 0.01$; $MS_{\text{error}} = 3.49$; $\omega^2 = 0.06$). While subjects in the structure-provided condition accessed 7.01 subcategories, those in the structure-not-provided condition accessed only 6.07 subcategories. Moreover, as predicted, this effect was largely explained by the differences in the number of minor subcategories accessed. Provision of structure increased the number of minor subcategories from 0.9 to 1.45 ($F_{1,209} = 26.6$, $p < 0.01$; $MS_{\text{error}} = 0.6$; $\omega^2 = 0.167$). Additionally, there was also a significant difference between the two structure groups in terms of the number of major subcategories retrieved (3.5 in the no structure group vs. 3.75 in the structure group; $F_{1,209} = 4.06$, $p < 0.05$; $MS_{\text{error}} = 0.82$; $\omega^2 = 0.014$). This may be due to individual differences in categorization. At least for some subjects, the categories classified in this study as “major”, on the basis of a two-thirds majority mention, may actually be “minor”. Provision of structure may aid retrieval for this group of subjects, accounting for the incremental recall of major subcategories when structure is provided. Notwithstanding the reason for the significant effect observed for the major subcategories, the ef-

fect size was an order of magnitude stronger for the minor subcategories ($\omega^2 = 0.167$ vs. 0.014; according to Cohen (1977), an ω^2 of 0.167 indicates a large effect size while 0.014 indicates a small effect size). Thus, the results offer support to H1.

3.2.2. Test of H2

Brand recall data were also submitted to a structure \times cue ANOVA. As predicted, there was a main effect of structure ($F_{1,209} = 9.16$, $p < 0.01$; $MS_{\text{error}} = 24.5$; $\omega^2 = 0.037$). Subjects in the structure condition retrieved more brands (13.8) than did those in the no-structure condition (11.9). This result offers strong support to H2. Taken together, H1 and H2 support the notion that the use of category structure at retrieval enhances brand accessibility primarily by activating otherwise inaccessible subcategory nodes, i.e., minor subcategories.

3.2.3. Test of H3

H3 predicts that the provision of category structure lessens the inhibitory effects of part-set cues on retrieval of subcategories. This suggests that (i) as in previous research, we should obtain a significant negative effect of cuing when no structure is provided and (ii) this negative effect should decrease when structure is provided. This hypothesis would receive support if there were a structure \times cue interaction effect on the total subcategories recalled. We did not obtain a significant structure \times cue interaction ($F < 1$). As a diagnostic test to verify whether there is at least directional support for this hypothesis, we performed simple effects analyses that examined the effect of part-set cues on subcategory retrieval for each level of structure. In the no structure condition, there was a significant part-set cue effect ($F_{1,209} = 4.96$, $p < 0.03$; $MS_{\text{error}} = 3.49$; $\omega^2 = 0.02$).

⁶ The product class factor did not interact with any of the dependent variables of interest. The data were thus analyzed by collapsing across the three product classes.

That is, retrieval was significantly less when the part-set cues were present than when they were absent (5.6 vs. 6.4). However, when structure was provided, the effect reduced to nonsignificance ($F_{1,209} = 1.03$, $p > 0.35$; $MS_{\text{error}} = 3.49$; $\omega^2 = 0.001$).

We also performed another analysis to test for the structure \times cue interaction. The dependent variable in this latter analysis, however, was not the total number of all subcategories recalled but only the sum of *major and minor* subcategories recalled. We excluded the “other” subcategories recalled. Recall that we classified those subcategories that were recalled by fewer than 20% of subjects as other. That only very few people could recall a subcategory might be because this subcategory is too fuzzy to be included in the product class or that most people are not aware of or familiar with this subcategory. Because our propositions are not meaningful under either of these contexts, we believe that considering only the major and minor subcategories (and excluding “other” subcategories) would be a more appropriate test of H3.

This latter analysis uncovered a significant structure-by-cue interaction ($F_{1,209} = 5.80$, $p < 0.02$; $MS_{\text{error}} = 1.47$; $\omega^2 = 0.02$). The follow-up analyses revealed that when no structure was provided, there was a significant effect of part-set cues on the recall of major and minor subcategories (4.8 when there was no cue and 4.0 when there was part-set cues). This effect was absent when category structure was provided (5.2 for each level of cue; see Table 1). Thus, the results of these latter analyses also offer support for H3.

3.3. Discussion

To summarize the results of Experiment 1, it is clear that the provision of structure to subjects prior to recall increases the number of subcategories and brands retrieved, and attenuates the negative effects of part-set cues on retrieval. These retrieval effects were traced back to the likelihood that priming of category structure allows greater access to the otherwise nonsalient, minor subcategories in each product class. It is clear that brands in minor subcategories could stand to gain by ensuring that consumers have

access to subcategory structure at the time of retrieval. In Experiment 2, we examine whether and under what conditions the obtained effects of provision of structure on retrieval carry over to brand choice.

4. Experiment 2

4.1. Overview

Experiment 1 examined the effects of providing category structure on brand retrieval processes. It could be argued that whereas increased accessibility leads to greater recall, the higher motivational levels inherent in the brand choice process could offset the effects of providing category structure on choice. Experiment 2 examines situations in which memory for subcategories strengthens evaluation–choice consistency. We argue that accessing an already existing category structure enhances evaluation–choice consistency. In this experiment, we compare the choices of subjects who were provided category structure at both learning and retrieval with other groups that received structure cues only at retrieval or at learning, or received no structure cues at all.

4.2. Method

4.2.1. Design

Subjects were assigned to a 2 (structure provided or not provided at the time of learning) \times 2 (structure provided or not provided at the time of choice) between-subjects factorial design. Subjects in the experiment were given information about a set of fictitious restaurants. The information was either structured (i.e., presented in subcategories) or unstructured at learning. Further, as before, subjects were either reminded, or not reminded, of this subcategory structure when making their choice.

4.2.2. Subjects

Eighty subjects participated in the study. They were students at a large northeastern university in the United States. They were recruited from various undergraduate classes and paid US\$6 for their participation.

4.2.3. Stimuli

The product class of restaurants was used since it was relatively easy to create fictitious new restaurant descriptions that were nonetheless realistic. The restaurants were designed to be of interest to student subjects. Descriptions of eight “eateries” were created, all of them in the vicinity of the university, and all described as “accessible lunch spots”. The descriptions, similar to those found in brief university guides, were included in a booklet that was labeled “A Brief Guide to Campus Eateries”. Subjects were informed that the list was meant to serve as a quick reference guide, and that all places included were hygienic, and of acceptable quality. Each restaurant was given a fictitious name and described on four attributes: distance from campus, type of food/menu, atmosphere, and price. All restaurants were close by (between four and seven minutes away); however, they varied on the other three dimensions. The type of atmosphere, and the price of an average meal, for example, varied from typically fast-food (burger and fries, \$4.50 per lunch) to relatively upscale (Japanese, \$12.00 per lunch). The restaurants could also be classified into two broad subcategories: Ethnic Eateries offering Japanese, Chinese, Greek, or Indian menus and Regular Eateries offering Soup and Salad, Burger and Fries, Deli, or Steak/Seafood menus.

4.2.4. Procedure

Subjects were run in small groups of about three or four. Each small group was randomly assigned to one of four experimental conditions. They were told the experiment was designed to examine the topic of consumer learning — how consumers acquired and learned information about new products and advertisements. They then were presented with “Learning Task #1” on new products, which required them to learn as much as they could about some campus eateries. They were asked to imagine that they were new to town, and that they were encountering these restaurant descriptions during their orientation to campus.

Subjects were given the list of fictitious stimulus restaurants, and four minutes to learn as much as they could about them. Pretests indicated that four minutes was more than adequate for all subjects to learn the restaurant information. One half of the

subjects saw the descriptions organized into two subcategories under the headings “Ethnic Eateries” and “Regular Eateries”. The descriptions were not organized in any obvious way for the other half of the subjects. Two random orders of restaurant descriptions were used within each group.

At the end of the four minutes, the descriptions were taken away and subjects were given “Learning Task #2” on new advertisements. For this task, subjects were asked to imagine that they were marketing managers making a decision on a market research supplier. They then saw a real advertisement from a market research company. Subjects were given two minutes to learn as much as they could about the ad. After they processed the information contained in the ad, subjects were given a two-page questionnaire. The first page collected information on subjects’ preferences for various brands, ads, and TV shows. On the second page, subjects were asked five questions on details of the ad that they had just seen. These questions required them to retrieve various aspects of the ad from memory, ostensibly testing their capacity to “learn” this material in the time provided. The filler task took approximately 10 minutes to complete and served two purposes: First, it was intended to clear working memory prior to retrieval and choice. Second, it was intended to support our claim that the experiment was about consumer learning of both products and ads, and thus reduce the likelihood of experimental demand.

Once subjects had completed the filler tasks, they were presented with the questionnaire containing the critical dependent measures of brand (restaurant) choice and preference. For the choice task, they were given a specific usage-situation as follows:

Imagine that you are at school and want to go to lunch. It is the end of the month, and you only have a little money left to spend. You want to get a cheap lunch.

As required by the structure-at-retrieval manipulation, one half of the subjects then were reminded (on the questionnaire) of the two subcategories (i.e., ethnic and regular) within the category, while the other half were not. Next, they were required to indicate their first and second (if the first choice was closed) choices for the usage situation. Subjects were

not allowed to refer back to the stimulus descriptions, but had to make their choices from memory.

Once they had indicated their choices, subjects were presented with the names of all eight eateries and asked to rate their preferences for each, for the same usage situation. They were allowed to refer back to the booklet of restaurant descriptions for this purpose.

Finally, subjects were asked to describe what they thought was the purpose of the study, debriefed, and paid for their participation.

4.2.5. *Dependent measures*

The brand choice (first or second) and brand preference (6-point like–dislike scale) measures collected from subjects were combined to compute a measure of choice–evaluation consistency (CHOICE), for each subject. Consistency was operationalized as the degree to which subjects were able to choose in consonance with their stated brand preferences, for the situation when the restaurant descriptions were available. That is, subjects who listed their two most preferred brands as their first two choices were given credit for absolute evaluation–choice consistency under the described usage situation.

4.3. *Results and discussion*

Recall that our primary interest in this study was to understand the conditions under which the provision of structure at retrieval allows subjects to make choices that are consistent with their evaluations. In particular, we hypothesized that there would be a greater consistency between evaluations and choices when the brand information that consumers possess is organized in a category structure and category structure is provided at the time of making a decision. Thus, following Keppel’s (1991) recommendation, we analyze the data using planned contrasts.

Data for the CHOICE measure is presented in Table 3.

It was hypothesized that those subjects provided with structure at both learning and retrieval would be able to exhibit a greater consistency than those in the other three conditions. A number of planned contrasts were used to compare the performance of this group (structure at learning and retrieval) with the other three groups.⁷ Since the hypothesis is directional, single-tailed tests were used for all comparisons. Consistent with expectations, subjects provided with structure at both learning and retrieval showed a greater evaluation–brand choice consistency than did those in the other groups combined ($F_{1,76} = 3.76, p < 0.03$; means = 0.70 vs. 0.45). Further, there is a marginally significant difference between the subjects receiving structure information at both learning and retrieval and those provided with structure at retrieval alone (means = 0.70 vs. 0.45; $F_{1,76} = 2.51, p < 0.06$). Although the performance difference between the group provided with structure at learning alone and those cued at both learning and retrieval was in the predicted direction, the difference failed to reach conventional level of significance (means = 0.50 vs. 0.70; $F_{1,76} = 1.60, p < 0.11$; see Table 3). Finally, as expected, there was no difference between the control group and the groups in which structure was provided either at learning or at retrieval ($F_{2,76} < 1$).

To summarize, from the results of Experiment 2, it is clear that the effects of structure on brand retrieval extend to choice. A salient category structure allows subjects to retrieve relevant brand information, and make a choice that is consistent with one’s preferences. In addition, it is shown that structure functions as an effective retrieval cue primarily when the brands have previously been organized in that fashion. Given that the delay between learning category structure and choice was extremely short (less than 15 minutes), the results offer a conservative test of our proposition, notwithstanding that some of these results were only marginally significant.

Table 3
Experiment 2: proportion of choices consonant with stated preference

		Structure provided at learning	
		No	Yes
Structure provided at retrieval	No	0.40	0.50
	Yes	0.45	0.70

⁷ We also performed a LOGIT analysis of the CHOICE data. The results obtained from ANOVA and LOGIT led to identical conclusions.

cant. We expect that with longer delays, the effects will be much stronger.

5. General discussion

The results of the two experiments reveal that the provision of category structure has a number of effects. It increases the number of (minor) subcategories accessed within the product category and also increases the number of brands retrieved from the product category. Additionally, provision of category structure reduces the likelihood of part-set cuing effects during retrieval for the major and minor subcategories. Finally, providing category structure increases the evaluation–choice consistency. This effect is more pronounced when the information to be retrieved has previously been organized into similar subcategories. Thus, the present research extends the findings of Alba and Chattopadhyay (1985, 1986) and Nedungadi (1990).

5.1. Rival hypothesis

Before discussing the theoretical implications of our results, we would like to rule out an alternative hypothesis for our results reported for Experiment 2. In Experiment 2, during the learning task, the order of presentation of the categories in the category structure at learning condition may have influenced both the subject's accessibility and preferences for the specific brands, through primacy. Thus, the order of presentation may have influenced evaluation–choice consistency, our dependent measure. While this is possible, our results would suggest that this was not a problem. If our manipulation providing category structure at learning influenced both accessibility and evaluation, we would expect the two groups that were not given category structure cues at *retrieval* but differed in terms of category structure provision at learning to differ in terms of evaluation–choice consistency. However, as noted in the Results section, these two groups did not differ. Indeed, the only condition that differs from the others is the condition in which subjects received category structure at both learning and retrieval, as was hypothesized.

5.2. Theoretical implications

5.2.1. Implications for memory models.

The role of cues in recall of previously learned information is a central theme in memory research. Traditional memory models (e.g., Anderson and Bower, 1973) propose that the objects or categories to be recalled are associated with one another. These models suggest that there are direct associations between categories (horizontal associations) as well as links between a category and the members of the category (vertical associations). As a result, Anderson and Bower (1973) and others have argued that an early recall of one of these categories or member items leads to recall of several associated items. Thus, these models assume that recall is “self-propagating” because the act of recall itself provides cues that guide later recall.

However, research from the tradition of part-set cuing, using an episodic memory paradigm, questions this assumption and proposes that, at least under certain conditions, recall would be “self-limiting” in that recall of certain items inhibits the recall of other items (Roediger, 1978). Our results support and extend this latter work by showing that, in *semantic memory* (Experiment 1), part-set cues inhibit recall by limiting recall from other categories. Thus, part-set cues act much like category label cues did in the work of Roediger (1978), where he showed that the provision of category labels as a retrieval cue inhibits the recall of items from, noncued categories. Further, this research extends to the semantic memory context, Roediger's finding that category label cues facilitate recall from within the cued categories. Further, our research suggests that this facilitation is strong enough to attenuate the inhibitory effects of part-set cues. The overall consistency of our findings with those of Roediger also questions the need for horizontal associations between categories in semantic memory, an issue raised by Roediger (1978) in the context of episodic memory.

Our results suggest an interesting opportunity for future research. Instead of providing category labels to make category structure salient, as was done here, one could provide a cue set that contains cues from each of the subcategories. Following the reasoning

presented by Raaijmakers and Shiffrin (1981), this should have a facilitative effect on recall, similar to that of providing category cue labels, rather than the inhibition effect observed in this and other research on part-set cues; showing that the direction of the effect of part-set cues depends on the *nature* of the cues.

5.2.2. *Implications for research on memory-based decisions*

When not all brands are physically present, the likelihood of retrieval determines the composition of the consideration set (Nedungadi, 1990). For some brands, the likelihood of retrieval will be always high because of the dominant market position that these brands occupy (e.g., pioneering brands; see Kardes et al., 1993). For other brands, retrieval can be temporarily heightened. Our findings that provision of category structure at both learning and retrieval results in greater evaluation–choice consistency may be explained by the inclusion in the consideration set of brands that are preferred but are not salient otherwise.

Posavac et al. (1997) offered evidence for the proposition that attitude–behavior consistency is determined jointly by the salience of the options in the decision context and the accessibility of the options from memory. Insofar as the strength of association between an option and its category is high, the option will be highly accessible. Our manipulations of provision of category structure both at the time of retrieval and at an earlier instance enhance the association between the minor subcategories and the higher order product category. These manipulations increase the likelihood of preferred brands that belong to the minor subcategories being included in the consideration set and being chosen eventually. Therefore, our results and the conceptualization are consistent with those of Posavac et al. (1997).

5.3. *Limitations*

As with most experimental designs, strict controls were maintained on the stimuli and manipulations used in the studies. In Experiment 1, structured and familiar product categories served as stimuli in order to facilitate measurement of accessibility effects. In Experiment 2 we used fictitious brands in order to

introduce a category structure to subjects. Memory processes similar to those identified in these studies are likely in other product classes, but may often be more diffuse and difficult to anticipate. It is also possible that subject characteristics, such as gender, may have an effect on subjects' responses, but was not examined in this research. Further, some of the experimental tasks such as asking subjects to imagine that they are marketing managers (Experiment 2) may be artificial. In addition, in Experiment 2, we prompted subjects to restrict their choices to less expensive restaurants. This restriction was common across the four experimental conditions, and there is no reason to suspect that the results would have been different had we not imposed this restriction. Nonetheless, because unconstrained choices would have increased the generalizability of our results, we consider this particular instruction as a limitation. These limitations have to be considered while thinking in terms of the marketing implications of our findings.

5.4. *Managerial implications*

5.4.1. *Marketing implications*

As we observed at the outset, examinations of market structure and product positioning implicitly assume that product category structures are salient to consumers. Our results, however, show that structure may often be inaccessible to consumers during choice, even in frequently purchased product categories. Further, when structure is made salient, it enhances recall of individual brands, especially from minor subcategories, and enhances evaluation–choice consistency. Thus, our results question the veracity of an important implicit managerial assumption with implications for key marketing decisions. In particular, this paper suggests that when positioning products, in addition to stressing particular attributes, an important part of positioning is to make salient a brand's place within the category structure. Successful brand positioning should thus include communication of the various subcategories in a product category, and the brand's membership in a specific product subcategory. Comparative advertising that clearly positions a brand in relation to its various competitors may be one way to make structure salient to consumers. Further, our results suggest that such a

strategy may be particularly valuable for an underdog brand; such brands may be able to overcome the dominating effects of well-established brands by making category structure salient.

5.4.2. Public policy implications

From a public policy perspective, the provision of structure reduces the inhibitory effects of part-set cues and allows consumers to retrieve more brand information so as to make choices consistent with evaluation. Further, this paper suggests that consumers could be induced to make choices consistent with their preference, not by increasing their knowledge of the product category, the typical policy response, but merely by making existing structures more apparent in memory. Consumer councils and consumer magazines may consider offering consumers more frequent exposure to category structure to enhance consumers' ability to choose more favorably evaluated brands.

Acknowledgements

The authors would like to thank the editor and the three anonymous reviewers for their helpful comments. The support of the R&D Department at INSEAD is also gratefully acknowledged.

References

- Alba, J.W., Chattopadhyay, A., 1985. The effects of context and part-category cues on the recall of competing brands. *Journal of Marketing Research* 22, 340–349.
- Alba, J.W., Chattopadhyay, A., 1986. Salience effects in brand recall. *Journal of Marketing Research* 23, 363–369.
- Alba, J.W., Hutchinson, J.W., 1987. Dimensions of consumer expertise. *Journal of Consumer Research* 13, 411–454.
- Alba, J.W., Hutchinson, J.W., Lynch, J.G., 1991. Memory and decision making. In: Robertson, T.S., Kassirjian, H. (Eds.), *Handbook of Consumer Behavior*. Prentice-Hall, Englewood Cliffs, NJ, pp. 1–49.
- Anderson, J.R., Bower, G., 1973. *Human Associative Memory*. Winston, Washington, DC.
- Cohen, J., 1977. *Statistical Power Analysis for the Behavioral Sciences*. Rev. edn. Academic Press, New York.
- Cohen, J.B., Basu, K., 1987. Alternative models of categorization: Toward a contingent processing framework. *Journal of Consumer Research* 13, 455–472.
- Day, G.S., Shocker, A.D., Srivastava, R.K., 1979. Customer-oriented approaches to identifying product-markets. *Journal of Marketing* 43, 8–19.
- Kardes, F.R., Kalyanaram, G., Chandrasekaran, M., Dornoff, R.J., 1993. Brand retrieval, consideration set composition, consumer choice, and the pioneering advantage. *Journal of Consumer Research* 20, 62–75.
- Keppel, G., 1991. *Design and Analysis: A Researcher's Handbook*. 3rd edn. Prentice Hall, Upper Saddle River, NJ.
- Lynch, J., Srull, T., 1982. Memory and attentional factors in consumer choice: Concepts and research methods. *Journal of Consumer Research* 9, 18–37.
- Nedungadi, P., 1990. Recall and consumer consideration sets: Influencing choice without altering brand preference. *Journal of Consumer Research* 17, 263–276.
- Nickerson, R.S., 1984. Retrieval inhibition from part set cuing: a persistent enigma in memory research. *Memory and Cognition* 12, 531–552.
- Posavac, S.S., Sanbonmatsu, D.M., Fazio, R.H., 1997. Considering the best choice: Effects of the salience and accessibility of alternatives on attitude–decision consistency. *Journal of Personality and Social Psychology* 72, 253–261.
- Raaijmakers, J.G.W., Shiffrin, R.M., 1981. Search of associative memory. *Psychological Review* 88, 93–134.
- Roediger, H.L., 1978. Recall as a self-limiting process. *Memory and Cognition* 6, 54–63.
- Smith, E.E., Medin, D.L., 1981. *Categories and Concepts*. Harvard University Press, Cambridge, MA.
- Tulving, E., Pearlstone, Z., 1966. Availability versus accessibility of information for words. *Journal of Verbal Learning and Verbal Behavior* 5, 381–391.
- Weitz, B.A., Wensley, R., 1988. *Readings in Strategic Marketing*. Dryden Press, Chicago, IL.
- Zyman, S., 1999. *The End of Marketing as We Know It*. Harper Collins, New York.