Implications of the Relationship Between Retrieval Strength and Storage Strength in a Comparative Advertising Context

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Marketers of little known brands often advertise their brands in comparison to the market leader. In order to avoid giving “free” advertising to the market leader some ads omit the name of the leader. While this practice may improve the brand image or positioning of the weak brand, our data show that such indirect comparison can hurt recall of the weak brand. Our results suggest that indirect comparisons in advertisements induce retrieval of the leading brand, thus taking cognitive resources away from the encoding of the weak brand, ultimately hurting later recall of that brand. We discuss our findings with respect to the New Theory of Disuse (Bjork and Bjork 1992; see also Estes 1955).

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Implications of the Relationship between Retrieval Strength and Storage Strength in a Comparative Advertising Context

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Marketers of little known brands often advertise their brands in comparison to the market leader in order to associate their brand with the qualities of the leading brand. In order to avoid giving “free" advertising to the market leader some ads omit the name of the leader either by showing the package of the leading brand and obscuring the name, or by verbally comparing the weak brand to “the leading brand” without ever mentioning the name of the leading brand. While this practice may improve the brand image or positioning of the weak brand, theories of the relationship of storage and retrieval strength of items in memory suggest that such indirect comparison might hurt recall of the weak brand.

Storage strength refers to how well-learned, inter-associated, or entrenched something is in memory, but has no effect on current accessibility in memory. Retrieval strength refers to how accessible something is in memory. Brand leaders exhibit high storage and retrieval strength. High retrieval strength increases the likelihood that the brand can be recalled in response to the “the leading brand" as a cue. Given that the act of generating information from memory modifies the system by further increasing retrieval strength, an indirect comparison in an ad, may actually improve recall of the leading brand. The high storage strength of the leading brand protects against loss of retrieval strength, making later retrieval of the leading brand more likely. In addition to improving recall of the leading brand indirect comparisons in advertisements may hurt recall of the weak brand by taking cognitive resources away from the encoding of the weak brand during the presentation of the ad.

**H1:** In response to Indirect Comparison [IC] – for ads that require high cognitive effort to process the leader will be generated and remembered. However, given that there is a more effortful generation process than in the IC – low effort case, recall for the advertised brand will be lower than in the IC – low effort case.

**H2:** In response to IC – low effort ads (in which the leader is not named), the leader will be generated resulting in higher recall of the leader than in response to Non-Comparative [NC] ads (in which the leader is also not named).

Our study employed a 2 x 4 within-subjects experimental design which varied storage strength of the brand (weak vs. market leader) and varied the type of comparison (Direct Comparison [DC], IC – low effort, IC – high effort, and NC). DC ads showed the package and name of the competing brand (Peclmann and Stewart 1990). IC ads showed the package of the competing brand with the name blanked out (Peclmann and Stewart 1990). Unlike previous research, which used either NC ads as controls (e.g., Gorn and Weinberg 1984) or IC ads as the control (Peclmann and Ratneshwar 1991), central to our hypotheses about generation effects, that greater cognitive effort in generating the market leader competitor brand would be associated with decreased recall of the advertised brand, we employed an IC – low effort condition, whereby we showed only the package of the competing brand, and an IC – high effort condition whereby there was a claim of comparison, although we did not show the package of the competing brand. A control condition included NC ads whereby we showed and referred to only the advertised brand.

Consistent with our first hypothesis, advertised brand recall for the IC – high effort condition was reliably lower than the NC condition, both when the market leader was the target, \( t(135) = 1.93, p = .05 \), and when the weak brand was the target, \( t(135) = 1.79, p = .07 \). Supporting our second hypothesis, comparison brand recall (cf. “competing brand recognition”; Mantanakis and Yoon 2009) for the IC – high effort condition was significantly higher than the NC condition, when the weak brand was the target, \( t(135) = 2.16, p < .05 \), despite the fact that in neither condition was the leader named or the leading brand package shown.

Our results support our hypotheses and suggest (a) that IC ads encourage retrieval of the comparison brand thus increasing its level of recall when compared to an NC ad presentation, and (b) IC ads, by encouraging generation of the competition, take cognitive resources away from the encoding of the advertised brand, thus hurting later recall of the advertised brand.

Our findings have important implications for comparative advertising. First, efforts by marketers to reduce exposure of competitive brands do work. Ads that obscure the name on the package of the leading brand lead to lower recall of the leading brand than do ads that explicitly name the leading brand. Second, not naming the leading brand and not showing its package further reduces (false) recall of the leading brand compared to ads that explicitly name the leading brand. However, this reduction comes at a cost in recall of the advertised weak brand. Furthermore, recall of the leading brand in this condition is still significantly higher than when a non-comparative ad is shown. Clearly if a marketer wishes to benefit from associating a weak brand with the category leader the marketer is better off showing the package with the leading brand obscured rather than simply comparing the brand to “the leading brand.” Furthermore, this finding underscores the importance of applying basic theories of memory to marketing applications in order to avoid negative unintended consequences.

On the Relationship between Retrieval Strength and Storage Strength in Comparative Advertising

There are many advantages for marketers of low market-share brands to explicitly position their brands relative to the market leader in a direct comparative (DC) advertising context (Droge and Darmon 1987; Gorn and Weinberg 1984; Sujan and Dekleva 1987; Walker, Swasy and Rethans 1985). DC positioning increases the image of the weak brand (Gorn and Weinberg 1984) primarily because it attracts attention to the weak brand (Peclmann and Stewart 1990). The very nature of DC ads, evoking a comparison to the market leader, leads to the adoption by consumers of “association heuristics” (Chaiken 1987), or a heightening of consumers’ perception of similarity between the weak brand and the well-known market leader. Persuasion theories involve the role of elaboration in attitude change (e.g., Petty and Wegener 1999), and as long as there is a moderate discrepancy between the advertised and comparative brand, elaboration is enhanced (Priester, Godek, Mayakankuppum and Park 2004). Taken together, findings suggest that DC ads increase attention to the ad, increase cognitive information processing, and lead to greater message and brand awareness (using memory measures), and increased brand attitudes, purchase intentions, and purchase behaviors (Grewal, Kavanoor, Fern, Costley and Barnes 1997). Indirect comparative (IC) advertising, whereby there is a
claim of comparison to the competition (e.g., with the package of the competing brand with the name obscured; Pechmann and Stewart 1990), is not as effective at positioning a weak brand relative to a market leader, compared to the DC case (Pechmann and Ratneshwar 1991). Pechmann and Ratneshwar (1991) argued that comparison heuristics such as “this brand is comparable to the market leader brand” (Chaiken 1987) are unlikely to be used by consumers in IC ads because in such ads, the market leader competitor is not actually named. We believe that this claim is one reason why IC ads have received minimal attention in the literature. However, given that marketers of weak brands are reluctant to want to give “free advertising” to the market leader, IC ads continue to prevail in the marketplace.

In the case of weak brands being positioned relative to the market leader in an IC advertising context, there is debate about whether consumers are likely to spontaneously infer the comparison brand’s identity (Goodwin and Elgar 1980; Pechmann and Stewart 1990; Walker et al., 1985). Recent research suggests that for IC ads, consumers do spontaneously think about specific competitors (e.g., the market-leader) and form mental representations of a particular competitor, namely the prototype brand of the advertised category (Miniard, Barone, Rose and Manning 2006). This is in-line with previous findings which have shown that DC ads encourage “exemplar-based” (Medin and Shaffer 1978) processing, whereas IC ads encourage “prototype-based” (Rosch 1975) processing (Snyder 1992). Thus, IC ads, although not explicitly mentioning which brand the competition is (e.g., “Xtra cleans better than the competition”), may elicit automatic generation of the name of the leading brand (Tide, in this case; Miniard et al 2006; see also Mantonakis and Yoon 2009).

This is a very important consideration given that such generation is a memory-modifier. That is, the very act of generation of this sort makes the brand more recallable in the future (Bjork 1975). In addition, successful generation is more effective when the generation itself is more effortful (Thios and D’Agostino 1976). Memory is a prime component of the hierarchy of comparative brand-side effects model (Lavidge and Steiner 1961; although see Grewal et al 1997). There is a great body of literature on such generation processes; items that have been generated are more memorable than items that have been simply read; Slamecka and Graf 1978). Although this effect has been applied to non-comparative situations (e.g., generation of either the brand name being advertised, or the category for the brand name, causes enhanced brand recall; Sengupta and Gorn 2002; McCann 1995), the effects of (potential) generation of the comparison brand (in IC ads) on recall of the advertised brand has not been examined in the literature. In this paper we posit that (1) spontaneous generation can act as a learning episode for the comparison brand, causing increased recall and recognition for the comparison brand, something that is not intended by advertisers employing IC ads, and more importantly, (2) the generation process (used towards the comparison brand) may actually preclude the successful encoding of the advertised brand. Our specific research question is, in conditions in which generation is more likely to occur, are consumers less likely to recall the advertised brand than if the ad did not evoke a comparison?

THEORETICAL BACKGROUND

Retrieval processes have been shown to play an important role in the recall of ads (Janiszewski, Noel and Sawyer 2003) and of brand names (Appleton-Knapp et al., 2005). Furthermore, work in educational and cognitive psychology has shown that actual “retrieval” or generation of information from memory is far more effective for learning than alternative presentation methods of the information (Bjork 1988). However, previous work demonstrates that retrieval is more or less effective at improving memory depending on levels of pre-existing knowledge about the stimuli (Bjork and Bjork 1992). The present study was motivated by the predictions of the New Theory of Disuse (Bjork and Bjork 1992; see also Estes 1955). We first define how the Theory characterizes memory content: as a function of “storage strength” (how well-learned something is) and “retrieval strength” (how accessible something is).

Storage strength refers to how well-learned, inter-associated, or entrenched something is in memory, but has no effect on current accessibility in memory. Thus, storage strength reflects the degree to which something has been learned. In addition, storage strength is assumed to never be lost. It is considered to be a latent variable that can enhance accessibility during “relearning” of something. To illustrate, high storage strength (e.g., knowledge of the market leader, Tide) allows one to learn a new association to Tide (e.g., Lilac Tide), even though that knowledge of (of Tide) is not currently accessible in memory. However, low storage strength (e.g., a weak brand) undermines one’s ability of further learning, which is why it is difficult to learn about a new brand if the person has no background knowledge about it. That is, storage strength determines one’s ability to interpret new information in light of existing information, and serves to create additional opportunities to further increase knowledge. For this reason, it makes sense to use consumers’ knowledge of well-known brands to position new brands.

Retrieval strength refers to how accessible something is in memory. The very act of generating information from memory modifies the system by further increasing accessibility. In addition, the very act of successful generation facilitates later remembering only to the extent that it is difficult or involving. This is a highly adaptive property of memory: retrieval strength is affected by frequency, recency, and difficulty of access, and is very limited. Only a limited number of concepts can have high retrieval strength in any given moment, otherwise, the system could not function.

One of the major assumptions of the Theory is that storage strength should affect generation. That is, given the category “laundry detergent”, people should more easily generate “Tide”. In addition, the lower the retrieval strength at a given point, the more that item stands to benefit when it is generated. This means that IC ads (e.g., “Xtra cleans tough stains better than the leading brand”) may not only encourage accurate generation of the market leader, but retrieval strength of the market leader would be enhanced. Finally, another assumption of the Theory is that increasing retrieval strength of one item in a category simultaneously decreases retrieval strength of competing items in a category.

In a competitive advertising situation, marketers of weak brands, about which consumers have relatively little knowledge, will often compare their brand to the leading brand, about which consumers may know a great deal. We posit that such positioning, although effective at creating an association with an already well-known brand in DC ads, may actually harm recall of the advertised weak brand in the context of IC ads (e.g., in generating Tide in the above example, one may be less likely to recall Xtra). We argue that the harmful effect on the weak brand is more robust in situations whereby consumers must engage in more effortful processing in generating the market leader brand in IC ads.

We employed a 2 x 4 within-subjects experimental design which varied storage strength of the brand (weak vs. market leader) and varied the type of comparison (DC, IC – low effort, IC – high effort, and non-comparative; NC). We did not assume that there is little advantage to using a weak brand as the comparison brand
(Grewal et al., 1997), and instead chose to use a completely crossed design. DC ads showed the package and name of the competing brand (Pechmann and Stewart, 1990). IC ads showed the package of the competing brand with the name blanked out (Pechmann and Stewart, 1990). Unlike previous research, which used either NC ads as the control (e.g., Gorn and Weinberg, 1984) or IC ads as the control (Pechmann and Ratneshwar, 1991), central to our hypotheses about generation effects—that greater cognitive effort in generating the market leader competitor brand would be associated with decreased recall of the advertised brand—we employed an IC—low effort condition, whereby we showed only the package of the competing brand, and an IC—high effort condition whereby there was a claim of comparison, although we did not show the package of the competing brand. A control condition included NC ads whereby we showed and referred to only the advertised brand.

We expected that in IC ads, the weak brand will be confused with the leader, and there will be source confusions due to a plausibility heuristic (Johar et al., 2006). More importantly, the level of effort in retrieving the competitive brand required by the IC ad will directly influence the probability of recall of the advertised brand. More formally,

**H1:** In response to IC—high effort ads, the leader will be generated and remembered. However, given that there is a more effortful generation process than in the IC—low effort case, recall for the advertised brand will be lower in the IC—high effort than in the IC—low effort case.

We also expected that in IC ads, some participants would retrieve the competitive brand thus increasing its recall when compared to the NC ads despite the fact that the brand name was not presented in either condition.

**H2:** In response to IC—low effort ads (in which the leader is not named), the leader will be generated resulting in higher (false) recall of the leader than in response to NC ads (in which the leader is also not named).

The key dependent variables were category-cued recall of the advertised and comparison brands.

**Method**

**Participants.** In total, 384 undergraduates, from introductory marketing courses at a large, west coast university, participated as partial fulfillment of course requirements. 152 participants completed the first pilot test, 98 completed the second pilot test and 134 completed the experiment.

**Materials.** In order to generate a list of brands that was recognizable for our participants we conducted a series of pilot tests. In the first pilot test we asked 152 students to list brands that they knew in 40 different product categories (e.g., “Name every brand of candy bar that you can think of”). By computing the percentage of students who named various brands within a product category we determined which brands were the leading brands or weak brands based on retrievability of the brand among students comparable to our participants. From this pre-test we selected eight product categories in which the brand leader was named by at least 80% of participants and in which the next most named brand was named by fewer than 50% of participants. By doing so, we assured that our target categories had clear brand leaders.

A second pilot study was conducted with 98 students to determine a) whether it was possible for students comparable to our participants to generate (from memory) the target brands when presented with a photo of the package with the name erased and b) if students had heard of the weak target brands. Participants viewed a series of 50 photos of product packages from the eight categories determined in the first pilot test. Half of the photos showed the package with the brand name obscured whereas the other half showed unedited packages. In response to the unedited photos participants were simply asked to state whether or not they had heard of the brand before. When participants saw the photos with the brand name obscured, they were asked to generate the brand name (if possible). In all of our eight target categories the brand leader was correctly identified from photos showing the package with the brand name obscured at least 88% of the time. We selected the weak brand for each category by selecting the brand that was generated by fewer than 15% of participants in our first pilot test, yet was recognized by the most participants in our second pilot test. Table 1 lists the eight product categories in addition to the leading and weak brands in each.

**Design.** We employed a 2 x 4 within-subjects design which varied the brand type being advertised (leading brand vs. weak) and varied the type of comparison by the text and the photos in each (see Table 2). DC ads showed the package and name of the competing brand, however there was an X through the photo of the comparison brand. The text described how the target was better than the comparison brand (e.g., “Tide cleans tough stains better than Xtra” in the case of a leading brand target, or “Xtra cleans tough stains better than Tide” in the case of a weak brand target. IC—low effort ads showed the package of the target brand and an X through the package of the comparison brand with the brand name obscured. IC—high effort ads did not show the name or the package of the competing brand but rather showed the package of the target brand with a generic photo of the product category (e.g., a bowl of soup in the soup category). The accompanying text of the IC ads was the same as in the DC condition except that instead of naming the comparison brand, the comparison brand was simply referred to as “the competition” in the case of a leading brand target, or “the leading brand” in the case of a weak brand target. NC ads showed and referred to only the advertised brand, and depicted the same photos as the IC—high effort ads, but the text simply described a positive attribute of the target brand.

In order to control for specific item effects, every product category was shown in each condition. Also, an 8 x 8 Latin square was used to eliminate presentation-order effects. Conditions appeared in 8 different sequences and within each of those sequences every category appeared once in each position. Each sequence was preceded by two filler ads followed by a news brief and then two more filler ads to control for primacy effects. The same pattern ended each sequence to control for recency effects. Of the eight filler ads two were comparison ads and 6 were not in order to prevent any demand effects that might have resulted from the uneven number of comparative target ads.

**Procedure.** Participants viewed a fictitious website that contained articles, target ads, and filler ads (cf. Pechmann and Stewart’s, 1990, “electronic magazine”). Similar to Pechmann and Stewart (1990) the advertised brand, shown on the left-hand side, was shown in a large picture, whereas the comparison brand, shown on the right-hand side, was shown in a smaller picture (see Table 2).

Participants viewed a total of 16 ads and 2 news briefs that were presented on a computer. The ads were shown for 6 seconds each, and the news briefs for 24 seconds each making the study phase of the experiment about 2.5 minutes long. Following the study phase participants worked for 10 minutes on a distractor task consisting of difficult mazes. The test phase of the experiment...
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was a category-cued recall test in which 3 answer spaces were given for each category.

Results and Discussion

The recall data for advertised brands are reported in table 3. Participants correctly recalled more of the leading brands than the weak brands, $F(1, 133) = 230.63, MSE = 67.51, p < .0001$, and there was also a main effect of ad type, $F(3,133) = 4.29, MSE = .81, p < .005$. The interaction was not significant, $F < 1$. Interestingly, although no other cells were significantly different from the NC condition, consistent with our first hypothesis, advertised brand recall for the IC–high effort condition was reliably lower than the NC condition, both when the leader was the target, $t(135) = 1.93, p = .05$, and when the weak brand was the target, $t(135) = 1.79, p = .07$.

The recall data for comparison brands are reported in table 4. Participants recalled more of the leading brands than the weak brands, $F(1, 133) = 359.17, MSE = 34.90, p < .0001$, and again there was a main effect of ad type, $F(3,133) = 61.83, MSE = 9.35, p < .0001$. Furthermore, there was an interaction between ad type and brand strength, $F(3,133) = 8.91, MSE = 1.34, p < .0001$. Supporting our second hypothesis, comparison brand recall for the IC–high effort condition was significantly higher than for the NC condition, when the weak brand was the target, $t(135) = 2.16, p < .05$, despite the fact that in neither condition was the leader named or the leading brand package shown. Another interesting result was that when weak brands are advertised in the IC-low effort condition, recall of the leader is significantly lower than in the DC condition, $t(135) = 5.86, p < .0001$ and when weak brands are advertised in the IC-high effort condition, recall of the leader is significantly lower than in the IC-low effort condition, $t(135) = 4.16, p < .0001$. Obscuring the name of the leader reduces recall of the leading brand in comparative advertising as does not showing the leading brand package at all.

Our findings have important implications for comparative advertising. First, efforts by marketers to reduce exposure of competitive brands do work. Ads that obscure the name on the package of the leading brand lead to lower recall of the leading brand than do ads that explicitly name the leading brand. Second, not naming the leading brand and not showing its package further reduces (false) recall of the leading brand compared to ads that explicitly name the leading brand. However, this reduction comes at a cost in recall of the advertised weak brand. Furthermore, recall of the leading brand in this condition is still significantly higher than when a non-comparative ad is shown. Clearly if a marketer wishes to benefit from associating a weak brand with the category leader the marketer is better off showing the package with the leading brand obscured rather than simply comparing the brand to “the leading brand.” Furthermore, this finding underscores the importance of applying basic theories of memory to marketing applications in order to avoid negative unintended consequences.

### TABLE 1

<table>
<thead>
<tr>
<th>Categories</th>
<th>Leading Brand</th>
<th>Weak Brand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bar Soap</td>
<td>Dove</td>
<td>Coast</td>
</tr>
<tr>
<td>Laundry Detergent</td>
<td>Tide</td>
<td>Xtra</td>
</tr>
<tr>
<td>Potato Chips</td>
<td>Lays</td>
<td>Tim’s</td>
</tr>
<tr>
<td>Facial Tissue</td>
<td>Kleenex</td>
<td>Puffs</td>
</tr>
<tr>
<td>Mouthwash</td>
<td>Listerine</td>
<td>Act</td>
</tr>
<tr>
<td>Yogurt</td>
<td>Yoplait</td>
<td>Brown Cow</td>
</tr>
<tr>
<td>Beer</td>
<td>Budweiser</td>
<td>Red Hook</td>
</tr>
<tr>
<td>Canned Soup</td>
<td>Campbell’s</td>
<td>Amy’s</td>
</tr>
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### TABLE 2

<table>
<thead>
<tr>
<th>Ad Type</th>
<th>Leading Brand</th>
<th>Weak Brand</th>
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<tbody>
<tr>
<td><strong>Direct Comparative</strong></td>
<td><img src="image1" alt="Image" /></td>
<td><img src="image2" alt="Image" /></td>
</tr>
<tr>
<td><strong>Indirect Comparative</strong> - low effort</td>
<td><img src="image3" alt="Image" /></td>
<td><img src="image4" alt="Image" /></td>
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<tr>
<td><strong>Indirect Comparative</strong> - high effort</td>
<td><img src="image5" alt="Image" /></td>
<td><img src="image6" alt="Image" /></td>
</tr>
<tr>
<td><strong>Non Comparative</strong></td>
<td><img src="image7" alt="Image" /></td>
<td><img src="image8" alt="Image" /></td>
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TABLE 3
Recall of Advertised Brand

<table>
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<th>Ad Type</th>
<th>Advertised Brand</th>
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<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Weak Brand</td>
<td>Leading Brand</td>
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<tr>
<td>Direct Comparative</td>
<td>0.29</td>
<td>0.84</td>
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<tr>
<td>Indirect Comparative (low effort)</td>
<td>0.28</td>
<td>0.74</td>
<td></td>
</tr>
<tr>
<td>Indirect Comparative (high effort)</td>
<td>0.20</td>
<td>0.68</td>
<td></td>
</tr>
<tr>
<td>Non-Comparative</td>
<td>0.29</td>
<td>0.78</td>
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</table>

TABLE 4
Recall of Comparison Brand

<table>
<thead>
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<th>Ad Type</th>
<th>Comparison Brand</th>
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<tbody>
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<td></td>
<td>Weak Brand</td>
<td>Leading Brand</td>
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<tr>
<td>Direct Comparative</td>
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<td>0.81</td>
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<td>0.10</td>
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<td></td>
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<td>0.09</td>
<td>0.34</td>
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<td>Non-Comparative</td>
<td>0.01</td>
<td>0.24</td>
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REFERENCES


Subsequent Recall,” *Journal of Marketing Research*, 39 (May), 186-201.


