

Running Head: Hemispheric Processing of Slogans

Brand Familiarity in Advertisement Slogans: The Role of the Left and Right Cerebral Hemispheres

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Abstract

Previous research shows that brand familiarity can affect purchase behavior, such that a familiar brand will be preferred over a less familiar brand. Previous research also shows that the use of metaphoric advertisements increases purchase intent. However, it is unknown how consumers *implicitly* process familiar brands when reading advertisements. Through the divided visual field paradigm, we investigated how the left and right cerebral hemispheres process familiar brands when presented with advertisement slogans. Participants in this experiment read familiar brand names and were presented with metaphoric, literal, or neutral slogans. Participants responded to related target words briefly shown to either the right or left hemisphere. The right hemisphere showed greater facilitation for literal than for metaphoric slogans when consumers were presented with familiar brands. Purchase intent ratings were higher when targets were presented to the left hemisphere. These findings suggest that brand familiarity influences consumers' processing of slogans in the right hemisphere and affects purchase intent ratings in the left hemisphere.

Keywords: Advertisements, Brand names, Cerebral hemispheres, Cognitive neuroscience, Consumer behavior, Implicit processing

1. Introduction

There are two factors that likely influence advertisement comprehension and consumers' purchase behavior: metaphoric advertisement slogans and brand names. Figurative slogans are commonly used to advertise products (e.g., Leigh, 1994; McQuarrie & Mick, 1996; McQuarrie & Phillips, 2005; Toncar & Munch, 2001). For example, "It's a garden with a lid" has been used by Tostitos to advertise their brand of salsa. Although behavioral studies demonstrate that figurative language can positively impact consumer behavior (e.g., Goodstein, 1993; Greenwald & Leavitt, 1984; Lee & Olshavsky, 1995; McGuire, 2000; McQuarrie & Phillips, 2005; Toncar & Munch, 2001), little is known about the influence of *familiar brand names* on the processing of slogans containing figurative language. By using cognitive neuroscience methodologies, such as the divided visual field paradigm, marketers can gain more detailed information to help explain consumer behavior that might be overlooked with behavioral methodologies commonly used in marketing research. For example, by examining hemispheric activity during advertisement comprehension, marketers can learn more about consumers' implicit processing (i.e., cognitive processing that occurs outside one's awareness) of advertisements. Previous research suggests that the right and left hemispheres process advertisement information differently (e.g., Janiszewski, 1988). Specifically, research shows a right hemisphere advantage for more emotional processing and a left hemisphere advantage for more rational processing (e.g., Calvo & Nummenmaa, 2007; Jones, 1980,

1982). Therefore, an understanding of hemispheric processes during the comprehension of different types of slogans with brand names will enable marketers to create more effective advertising campaigns.

The primary aim of the current study is to gain a more comprehensive understanding of consumers' implicit processing of slogans with familiar brand names (such as Tostitos, Acura, and Jergens) and to investigate how this process is influenced by metaphoric and literal slogans. A secondary aim of the current study is to investigate the influence of brand familiarity on consumers' purchase intent of advertised products. Through this investigation, marketers and consumer researchers will gain a more clear understanding of how consumers' familiarity with brands affects their implicit processing of advertisement slogans and ultimately, their purchasing behavior.

2. Literature Review

2.1 Consumers' Implicit Processing

To more fully understand how consumers process advertisements, researchers can examine a consumer's implicit processing. Implicit processing, as opposed to explicit processing, occurs without one's awareness (Ito & Cacioppo, 2000; Woltz, 2003). When consumers encounter advertisements they likely experience a response at an unconscious (or subconscious) level that can later influence their purchase behavior (e.g., Janiszewski, 1988). Implicit processing is often overlooked in traditional market research settings. For example, consumers may verbally express how they feel about an advertisement in a focus group or in an online questionnaire, however, other cognitive processes likely occur that are not fully captured by these traditional research methodologies. In fact, some marketing studies have stressed the importance of examining a consumer's implicit processing. For example, advertisements that are adjacent to information participants are instructed to read influences participants' awareness of the brand in the advertisement, even though little attention was paid to the advertisement itself (Shapiro, MacInnis, & Heckler, 1997). In addition, previous research has shown that advertisement stimuli can unconsciously influence consumers' affect and brand preference (Janiszewski, 1988; see also Janiszewski, 1990, 1993). In sum, these previous findings suggest that consumers can form brand preferences, perhaps independently of their conscious awareness.

2.2 The Divided Visual Field Paradigm

A particularly effective way to measure consumers' implicit processing during advertisement comprehension is through an investigation of the cerebral hemispheres (e.g., Janiszewski, 1988). To examine hemispheric processing, previous studies placed the text or image of interest on either the left or the right side of the print in an advertisement. However, a more accurate cognitive neuroscience technique, called the divided visual field paradigm, can be used to isolate activity in each hemisphere during advertisement comprehension (Bourne, 2006). In this paradigm, target words that are related to the meaning of different stimuli (such as advertisement slogans) are quickly presented to one visual field-hemisphere. When target words are presented rapidly to the left visual field, this information is initially processed in the right hemisphere. In contrast, when target words are presented rapidly to the right visual field, this information is initially processed in the left hemisphere. Because information is presented so quickly, is shown at specific visual angles on a computer screen, and participants cannot move their eyes to the center of the presented target words (e.g., targets are presented faster than 200 ms) (Bourne, 2006), this paradigm allows researchers to compare processing across the left and right hemispheres of the brain. For example, if no differences are found between related target words in the hemispheres for different types of slogans, this would indicate that the type of slogan does not differentially influence how consumers process advertisement messages. If, however, consumers respond faster to related target words in one hemisphere than the other hemisphere, this finding would indicate that this particular hemisphere is more highly activated, or more heavily involved, during the comprehension of specific types of advertisement slogans. In other words, we could conclude that the type of slogan used in an advertisement influences how consumers process that information. Given previous research suggests that subconscious processes are involved in consumer preference (Holender, 1986; Janiszewski, 1988; Schacter, 1987), it is critical for marketers to gain insight into how advertisement text is implicitly processed in the cerebral hemispheres of consumers to more fully understand the specific impact on consumer behavior.

2.3 Previous Research on Consumers' Implicit Processing of Metaphoric Slogans

It is important to examine the use of metaphors in advertisements because metaphors have been shown to catch consumers' attention (Goodstein, 1993; McGuire, 2000), improve believability and memorability of the advertisement content (Lee & Olshavsky, 1995; McGuire, 2000; McQuarrie & Phillips, 2005; Toncar & Munch, 2001), elevate a consumer's mood (Heckler & Childers, 1992; McGuire, 2000; McQuarrie & Mick, 1996), and increase purchase intent. Using the divided visual field paradigm, a recent study examined implicit processing

during advertisement slogan comprehension (Vance & Virtue, 2011). In this previous study, a right hemisphere advantage was evident when consumers processed *both* metaphoric and literal slogans (Vance & Virtue, 2011). The findings from Vance and Virtue (2011) suggest an important role of the right hemisphere during advertisement comprehension, regardless of the type of slogan. Given that research techniques often used by marketing companies (e.g., focus groups and online studies) only tap into the explicit, rational side of consumers, the findings from Vance and Virtue (2011) provide a more in-depth account of the consumer psyche. However, a critical component was not examined in the previous study by Vance and Virtue (2011): the influence of brand names on the hemispheric processing of slogans.

2.4 The Influence of Brand Names

Brand names have been shown to be a critical component in determining what products consumers purchase (Holden & Vanhuele, 1999). Previous research suggests that a key difference exists between consumers' recognition of a brand and the ability of consumers to remember the context in which they saw the brand (Mandler, 1980). Interestingly, consumers often remember brands, but do not easily recall the advertisement in which the brand was presented (Moore & Hutchinson, 1983, 1985; Pashupati, 2003). In addition, research findings demonstrate that brand familiarity can influence consumer behavior (e.g., Bacon, 1970; Hannah & Sternthal, 1984; Jacoby, Kelley, Brown, & Jasenchko, 1989; Zajonc, 1980). For example, a familiar brand will likely be preferred over a less familiar brand because consumers trust more familiar brands (Bogart & Lehman, 1973; Holden & Lutz, 1992; Holden & Vanhuele, 1999). In addition, familiar brands promote liking, increase attention, influence consumers' product perception, and increase the likelihood a product will be seen on shelf (Janiszewski, 1993).

Currently, little research examines how consumers process familiar brands in each cerebral hemisphere. In a previous divided visual field study, researchers investigated hemispheric processes during brand name comprehension (Gontijo, Rayman, Zhang, & Zaidel, 2002). In this study, brand names (e.g., "Lexus"), common nouns (e.g., "army"), and non-words (e.g., "seid") were presented to either the right visual field-left hemisphere or the left visual field-right hemisphere and participants made word/non-word responses. No differences were found in response times to brand names between the hemispheres, suggesting that both hemispheres are similarly involved in processing brands (Gontijo et al., 2002). Although these findings suggest that familiar brands do not influence the hemispheres differently, it may be difficult to generalize these results to brands presented within the context of an advertisement slogan. Specifically, brands in this previous study (Gontijo et al., 2002) were single words (e.g., "Lexus") presented without a slogan or advertisement. Without presentation of the text included in an advertisement, it is difficult to know exactly how brand names influence the hemispheric processing during advertisement comprehension.

2.5 The Context of Brands in Advertisements

In fact, brand names may provide a framework, or the necessary context, to help consumers understand the intended meaning of an advertisement. For instance, ambiguous words (such as those words often contained in a metaphoric advertisement) are especially influenced by the context of other words in a sentence. When an ambiguous word is presented in isolation without any sentence context (e.g., "second"), readers activate multiple meanings of the ambiguous word (e.g., "time", "number"). If, however, the same ambiguous word is presented in a context containing other information (e.g., "She stood in line and was second"), fewer word meanings are activated and the meaning of the ambiguous word is more straightforward (e.g., Faust & Chiarello, 1998; Kacinik & Chiarello, 2007). Therefore, it is likely that the context provided by other words in a sentence is also important when consumers comprehend slogans.

2.6 Theoretical Perspectives on Implicit Processing and Brand Familiarity

To help explain how consumers *implicitly process* advertisements, it is useful to examine theories of how the cerebral hemispheres process text. Specifically, the Fine-Coarse Semantic Coding Theory states that the right hemisphere is primarily involved in processing distantly related word meanings, whereas the left hemisphere is involved in processing closely related word meanings (Beeman, 1993). For example, when readers are presented with the word "foot", alternative word meanings (e.g., "pay" or "12 inches") are thought to be activated in the right hemisphere, whereas more closely related word meanings (e.g., "heel" or "sock") are thought to be activated in the left hemisphere. Because metaphors, similar to ambiguous words, have multiple meanings that are semantically distant from the literal meaning, it is likely that the right hemisphere will also have an advantage when consumers process metaphoric slogans.

A theoretical framework may also help explain how *brand familiarity* influences consumers' processing of advertisement slogans. For example, the Graded Salience Hypothesis proposes that, regardless of whether a text

is metaphor or literal, the right hemisphere will have an advantage when individuals read unfamiliar text and the left hemisphere will have an advantage when individuals read familiar text (Giora, 1997). The Graded Salience Hypothesis is similar to the Fine-Coarse Semantic Coding Theory (Beeman, 1993) in that familiar text is associated with closely related word meanings (i.e., a left hemisphere process), whereas unfamiliar text is associated with distantly related word meanings (i.e., a right hemisphere process). However, only the Graded Salience Hypothesis explicitly predicts how familiarity will influence hemisphere activation. Therefore, the Graded Salience Hypothesis can be used to understand how the familiarity of a brand influences consumers' processing of advertisement content, whereas the Fine-Coarse Semantic Coding Theory can be used to understand how different types of slogans (e.g., literal versus metaphor) influence consumer's implicit processing of advertisements.

3. Objectives of the Current Study

The aim of the current study is to examine the influence of brand familiarity on consumers' implicit processing of metaphoric and literal slogans. In the current study, participants read a familiar brand name (e.g., "Tostitos") followed by either a literal, metaphoric, or neutral slogan. After reading the slogan, a word that is related to the meaning of the slogan (i.e., a target word) was presented to either the left visual field-right hemisphere or the right visual field-left hemisphere. Participants then indicated whether the target was a word (e.g., "fresh") or a non-word (e.g., "scort") as quickly and accurately as possible. Because the target words and nonwords were presented so quickly and at a specific visual angle, participants were unable to consciously process these targets. This ensures that participants implicitly (rather than explicitly) process the information in the slogan. In addition, this paradigm ensures that information related to the slogan is initially processed in only one visual field-hemisphere. These findings will provide a deeper level of insight into the specific processes that occur beyond a consumer's awareness – implicit processes that consumers, themselves, cannot easily explain or describe but that likely influence their purchasing behavior.

If brand familiarity influences hemisphere activation (based on the Graded Salience Hypothesis; Giora, 1997), there will be a left hemisphere advantage for both literal and metaphoric slogans. If, however, brand familiarity does not influence hemisphere activation (based on the Fine-Coarse Semantic Coding Theory; Beeman, 1993), there will be a left hemisphere advantage for literal slogans and a right hemisphere advantage for metaphoric slogans. These results will be important in that marketers can tap into factors that subconsciously influence consumer behavior. Previous research findings suggest that while consumers remember brands, they often fail to remember the advertisements in which they were presented (e.g., Moore & Hutchinson, 1983, 1985; see also Pashupati, 2003). If the brand is more influential than the advertisement, then the type of advertisement slogan will have no affect on hemispheric processing. Marketers can benefit from this research by gaining a better understanding of how both brand names, combined with figurative slogans, impact consumers' implicit processing during advertisement comprehension.

A secondary purpose is to investigate purchase intent of the products advertised in the different types of slogans. Based on previous findings showing that metaphoric advertisements increase purchase intent (e.g., Goodstein, 1993; Lee & Olshavsky, 1995; McGuire, 2000; McQuarrie & Phillips, 2005; Toncar & Munch, 2001) and that familiar brands increase preference (Bogart & Lehman, 1973; Holden & Lutz, 1992; Holden & Vanhuele, 1999), metaphoric slogans will likely receive higher purchase intent ratings compared to literal slogans. These findings are important to marketers as they can best assess the specific type of slogan that drives the highest purchase interest among consumers. Of particular importance to marketers is gaining a better understanding of how not only brand familiarity, but familiar brands in combination with metaphoric and literal slogans, drive consumers' purchase intent.

4. Method

4.1 Participants

One hundred eleven undergraduate students (73 females, 38 males) participated in this experiment in exchange for course credit in an Introductory Psychology course. Twelve participants were removed from the analyses because of program errors or not following instructions. To ensure the participants adequately understood the slogans in the current study, ten comprehension questions were randomly administered throughout the experiment. An additional 3 participants were removed from the analyses because they did not accurately comprehend at least 70% (or 7 out of 10) of these questions. Thus, 96 undergraduate students (63 females, 33 males) were included in the final analyses. All participants had normal or corrected-to-normal vision, were native English speakers, and had no neurological or visual damage. All participants were right-handed (mean laterality quotient = 0.87) as assessed by the Edinburgh Handedness Inventory (Oldfield, 1971).

4.2 Materials

4.2.1 Advertisement Slogans

The same stimuli used in Vance and Virtue (2011) were used in the current study. Specifically, the stimuli consisted of four sets of slogans: 48 metaphor, 48 literal, 48 neutral, and 48 filler slogans, for a total of 192 slogans. The metaphor, neutral, and filler slogans were taken from current media (e.g., magazines, billboards, television, and websites) and the literal slogans were the direct translations of the metaphoric slogans (taken from participants' responses in a pilot study from Vance and Virtue, 2011). To isolate the effects of the text present in an advertisement, all slogans consisted of one sentence. The filler slogans, which contained a metaphor and were paired with nonword targets, ensured that participants made an equal number of yes and no responses to the words / nonwords (i.e., the lexical decision task) so as not to bias participants' responses. In addition, the filler slogans contained metaphors so that the filler slogans did not clearly stand out from the other experimental slogans. The neutral slogans, which were not related to the target words, provided a baseline of hemisphere activation for each target word. By including the neutral condition, response times can be obtained for the identical target word in the metaphor, literal, and neutral condition in each visual field-hemisphere. Therefore, the inclusion of a neutral condition enables researchers to gain a more accurate comparison of language processing across the hemispheres. An example of each type of slogan is given in Table 1.

4.2.2 Pilot Studies

Three pilot studies were carried out to test the stimuli used in the current study. In the first pilot study, the 48 metaphoric slogans were previously tested for familiarity (see Vance and Virtue, 2011) with only unfamiliar slogans included in the materials. In the second pilot study, the familiarity of the 48 literal and 48 neutral advertisements was tested. Thirty-nine undergraduate students participated in exchange for course credit. Participants were instructed to rate how familiar they were with each slogan on a scale of 1 ("not at all familiar") to 7 ("very familiar"). To ensure participants did not already know the intended meaning of the metaphoric slogans prior to this study and to hold level of familiarity constant, it was important that all the slogans were rated as unfamiliar. Participant responses were averaged for each slogan. Overall, each set of slogans (literal and neutral) were rated as unfamiliar and did not significantly differ from each other ($M = 3.61$, $SE = .11$ and $M = 3.41$, $SE = .16$, respectively), $t(46) = 1.10$, $SE = .19$, $p > .05$.

In the third pilot study, the familiarity of the brand names was tested. Whereas it was important that the slogans were unfamiliar (to avoid participants already knowing the intended meaning of the metaphors based on familiarity), it was important the brand names were all familiar. Given previous research has shown that familiar brands promote liking (Janiszewski, 1993) and to measure how well-known brands such as Tostitos affect implicit processing, familiar brands were used in this study. One hundred nine undergraduate students participated in the pilot study in exchange for course credit. The brand name that was associated with each slogan was used whenever possible. However, if the brand name was unfamiliar to participants, a new brand name was chosen from the same product category (e.g., clothing) as the real brand name. Thus, all brand names used in the experiment were real brands. One hundred eighteen brands were tested. The brand names were presented with a generic product cue (e.g., "Food"), but were not presented with the slogan so as to not bias the results. Participants were instructed to indicate how familiar they were with each brand on a scale from 1 ("not at all familiar") to 7 ("very familiar"). Participant responses were averaged for each brand name. All brand names included in the final experimental materials were rated, on average, above 4 on the 7-point scale. See Table 1 for an example brand name presented with the metaphor, literal, neutral, and filler slogans.

4.2.3 Target Words

After the metaphor, literal, and neutral slogans were presented on a computer screen, each slogan was followed by a corresponding, related target word. The target words were taken from the participants' responses in a pilot study conducted by Vance and Virtue (2011). Each of the target words was highly related to the meaning of the metaphoric and literal slogans. For example, the target word "fresh" is highly related to the metaphoric slogan, "It's a garden with a lid" and the literal slogan, "This salsa is made with crisp vegetables". By presenting target words that are related to the metaphoric and literal slogans, we are able to measure the level of priming (i.e., semantic activation), reflecting the degree of implicit processing of these slogans by the current set of participants. Importantly, the target word "fresh" is not highly related to the neutral slogan, "The perfect margarita" so that a baseline measurement can be obtained for this target word in each visual field-hemisphere. All of the experimental conditions (e.g., metaphor, literal, and neutral) were paired with target words, whereas all of the filler slogans were paired with pronounceable non-word targets (e.g., "scort"). Non-word targets were

created by changing several letters in the target words to create pronounceable non-words. The non-word targets had on average the same number of letters, syllables, and frequency as the target words used in this study (as determined by Francis & Kucera, 1982). Each participant was presented with 48 target words and 48 non-word targets.

4.3 Procedure

Participants were presented with 96 slogans: 48 experimental slogans (16 metaphor, 16 literal, 16 neutral) with corresponding target words, and 48 filler slogans with corresponding non-word targets. Each experimental slogan was presented in only one of the three conditions (i.e., metaphor, literal, or neutral). Therefore, participants were presented with each target word and non-word only once during the entire experiment. This design ensured that each condition was presented an equal number of times and that participants read slogans in all of the conditions. Additionally, within each version, half of the targets were presented to the right visual field–left hemisphere and the other half of the targets were presented to the left visual field–right hemisphere. The order in which the slogans were presented in each version was randomized.

4.3.1 Experiment

All stimuli were presented on a computer screen. Participants' responses were made by the press of a button on a response box. Participants were seated 50 cm from the center of the computer screen. To ensure participants remained this distance from the screen and to minimize head movement, all participants placed their head in a chin rest throughout the experiment. Before each slogan was presented, the corresponding brand name (e.g., "Tostitos") was shown in the center of the computer screen. Presentation of the brand name was self-paced, so participants were instructed to press a button on a response box to advance the screen. Next, the slogan appeared in the center of the screen. Given that the length of each slogan varied slightly, presentation of the slogans was also self-paced to ensure that participants had an adequate amount of time for comprehension and to create a scenario most representative of a real-world setting. Participants were instructed to press a button on the response box after they carefully read each slogan. After the slogan disappeared, a fixation point appeared in the center of the screen. Participants were instructed to fixate both of their eyes on the center of the fixation point the entire time it was displayed on the screen (750 ms). This time parameter was chosen because it provided the participants sufficient time to generate an inference (Till, Mross, & Kintsch, 1988). Following the fixation point, a target word or non-word flashed quickly in either the right visual field–left hemisphere or the left visual field–right hemisphere for 176 ms. This length of time was used so that participants could not move their eyes from the fixation point to the center of the target word, thus ensuring that targets appeared in one visual field-hemisphere (Bourne, 2006). Each target word or non-word was presented at a visual angle of 3.54°. Next, participants performed a lexical decision task. In this task, participants were instructed to indicate as quickly, but as accurately as possible whether the letter string presented was a word or non-word by pressing a button on the response box (i.e., perform a lexical decision task). The use of a lexical decision task is important because it allows researchers to measure response time at an implicit level. For example, if participants respond more quickly to a related target than a neutral target, this indicates greater semantic priming and reflects more implicit processing (i.e., activation) for that specific slogan. Half of the participants completed the experiment with their right hand and the other half of the participants completed the experiment with their left hand.

4.3.2 Practice

Before the experimental trials, all participants completed a set of 10 practice items. The purpose of the practice was to ensure that participants understood how to comprehend metaphors and to become acquainted with the experimental procedure. The practice procedure was identical to the actual experiment, except that after the target was presented on the screen, a multiple choice question appeared. Participants were instructed to indicate which of the four options was the literal meaning of the metaphoric sentence they had just read. All participants achieved 70% correct on the practice items before moving on to the experimental items.

4.3.3 Comprehension Task

To ensure adequate comprehension of the metaphoric slogans, participants were randomly presented with comprehension questions throughout the experiment. Prior to the start of the experiment, participants were told they would be completing this comprehension task throughout the study. For these 10 comprehension questions, participants were instructed to write out the literal meaning of the slogan they had just read.

4.4 Purchase Intent Task

For the final task in this experiment, participants made purchase intent ratings on a single 7-point scale for each of the 48 experimental slogans (e.g., metaphor, literal, and neutral) with their corresponding brand names. They were asked, "On a scale of 1 ("unlikely") to 7 ("likely"), how likely would you be to purchase this product?"

5. Results

Lexical decision response times and accuracy to the target words were analyzed. The response times to target words (rather than slogans) were used as the dependent variable for several key reasons. First, the target words were directly related to the intended meaning of the metaphor and literal slogans. Therefore, responses to the target words helped determine whether or not participants successfully comprehended the slogan. Second, by measuring response times to the target words (rather than the slogans) this allows examination of implicit processing of information that is *not* explicitly stated in the slogan. Third, by using target words as the dependent measure, it allows us to control the specific variable of interest across the different conditions (e.g., metaphor, literal, and neutral).

To minimize the possibility of including outliers, the top and bottom 1% of the response times for each condition was eliminated from the analyses (see Ratcliff, 1993, for a discussion on this procedure). Only items that were correctly answered in the lexical decision task were included in the analyses. In all the analyses reported, F_1 refers to tests based on participant variability, and F_2 refers to tests based on item variability. An alpha level of .05 was used to determine the significance for all analyses.

5.1 Facilitation Effects

To test the hypothesis that brand familiarity influences hemispheric processing, analyses were conducted on the facilitation effects. Facilitation is obtained by calculating the difference between a baseline (i.e., the neutral slogans) and the experimental condition (i.e., the metaphor and literal slogans) response times in each visual field-hemisphere. See Table 2 for the mean response times and accuracies for the metaphor, literal, and neutral conditions. Facilitation effects are commonly reported in divided visual field studies because response times cannot be directly compared across hemispheres (due to the left hemisphere advantage in general for language comprehension). Thus, facilitation represents the advantage one hemisphere has over the other hemisphere for processing specific types of slogans (i.e., more facilitation indicates relatively more activation in that particular hemisphere).

A repeated measures analysis of variance (ANOVA) was conducted on the facilitation effects. The independent variables were visual field-hemisphere (left visual field-right hemisphere, lvf-RH, or right visual field-left hemisphere, rvf-LH) and condition (metaphor or literal). The mean facilitation for the metaphor and literal condition by visual field-hemisphere is presented in Figure 1. There was no main effect of visual field-hemisphere [$F_1(1, 95) = .35$, $MSe = 13,769.28$, $p > .05$; $F_2(1, 47) = .28$, $MSe = 11,788.56$, $p > .05$] or condition [$F_1(1, 95) = 1.41$, $MSe = 3,622.38$, $p > .05$; $F_2(1, 47) = .47$, $MSe = 3,125.38$, $p > .05$]. In addition, there was no visual field-hemisphere by condition interaction [$F_1(1, 95) = 1.48$, $MSe = 4,539.86$, $p > .05$; $F_2(1, 47) = 2.28$, $MSe = 2,702.53$, $p > .05$].

Paired samples t-tests were conducted on the facilitation effects as follow-up analyses. Importantly, there was a significant difference in the lvf-RH [$t(95) = -2.04$, $SE = 7.68$, $p < .05$], such that facilitation was greater for literal slogans than metaphoric slogans in the right hemisphere ($M = 20.73$, $SE = 10.34$, and $M = 5.04$, $SE = 10.68$, respectively). One sample t-tests were conducted on the facilitation effects to determine whether facilitation was above zero for each condition in each visual field-hemisphere. In the lvf-RH, facilitation was significantly greater than zero for literal slogans [$t(95) = 2.01$, $SE = 10.34$, $p < .05$], but not for metaphoric slogans [$t(95) = .47$, $SE = 10.68$, $p > .05$]. In the rvf-LH, facilitation was significantly greater than zero for literal slogans [$t(95) = 2.03$, $SE = 9.53$, $p < .05$] and for metaphoric slogans [$t(95) = 2.05$, $SE = 9.96$, $p < .05$].

5.2 Purchase Intent Effects

To investigate purchase intent, a repeated measures ANOVA was conducted on the participants' purchase intent ratings (average rating on 1-7 scale) for each condition across both visual field-hemispheres. One participant was removed from these analyses for not following instructions. The mean purchase intent rating for each condition by visual field-hemisphere is presented in Figure 2.

There was no main effect of condition [$F(2, 188) = 1.04$, $MSe = .41$, $p > .05$] or visual field-hemisphere [$F(1, 94) = 1.79$, $MSe = .35$, $p > .05$]. Further, there was no condition by visual field-hemisphere interaction [$F(2, 188) = .93$, $MSe = .37$, $p > .05$]. Paired samples t-tests were conducted as follow-up analyses. There was a significant difference between the visual field-hemispheres for the metaphoric slogans [$t(94) = -1.94$, $SE = .08$, $p = .05$],

such that purchase intent ratings were higher for targets presented to the rvf-LH than to the lvf-RH ($M = 4.36$, $SE = .10$; and $M = 4.21$, $SE = .10$, respectively). There was also a significant difference between the metaphor and neutral slogans in the rvf-LH [$t(94) = 1.95$, $SE = .08$, $p = .05$], such that the metaphoric slogans received higher purchase intent ratings than the neutral slogans ($M = 4.36$, $SE = .10$; and $M = 4.19$, $SE = .11$, respectively).

6. Discussion

The primary aim of the current research was to investigate how brand familiarity influences consumers' implicit processing of advertisement slogans. Based on the Graded Salience Hypothesis (Giora, 1997), a left hemisphere advantage was expected for both metaphoric and literal slogans. However, the Fine Coarse Semantic Coding Theory (Beeman, 1993) predicted a left hemisphere advantage for literal slogans and a right hemisphere advantage for metaphoric slogans. Surprisingly, the right hemisphere showed greater facilitation for literal slogans compared to metaphoric slogans. A right hemisphere advantage for literal slogans is consistent with previous findings from Vance and Virtue (2011). Given that Vance and Virtue (2011) did not include brand names in their study, this finding suggests that another factor may be influencing the processing of advertisement slogans, particularly for literal slogans.

These results cannot be easily explained by the Graded Salience Hypothesis (Giora, 1997) or the Fine Coarse Semantic Coding Theory (Beeman, 1993). Both of these theories are based on text comprehension and do not take into account level of creativity embedded in certain types of text. Advertisements, by their very nature, are intended to be creative and creative text may lead individuals to visualize information as they read. Therefore, while the Graded Salience Hypothesis (Giora, 1997) and Fine Coarse Semantic Coding Theory (Beeman, 1993) cannot easily explain the current findings, the findings can be explained when examining research on how individuals visualize information as they read text.

6.1 Right Hemisphere Advantage for Visualization of Advertisement Slogans

Previous research shows that readers activate relevant perceptual information (i.e., knowledge about an object based on previous experience) while comprehending a sentence (e.g., Stanfield & Zwaan, 2001; Zwaan, Stanfield, & Yaxley, 2002; Lincoln, Long, & Baynes, 2007). In fact, a right hemisphere advantage is evident when readers visualize text (Lincoln et al., 2007; Lincoln, Long, Swick, Larsen, & Baynes, 2008; Zwaan & Yaxley, 2003). For example, when participants are presented with two words simultaneously that are inconsistent with their spatial representations (e.g., "basement" appears above, rather than below "attic" on the computer screen), participants are slower at deciding if the two words are related to one another when these words are presented in the right hemisphere than when these words are presented in the left hemisphere. (Zwaan & Yaxley, 2003). Because spatially an attic is located above a basement, the longer response times in the right hemisphere suggest a unique role of the right hemisphere for the visualization of text. The right hemisphere also has an advantage for visualizing specific, rather than abstract, information (Koutstaal et al., 2001; Marsolek, 1995, 1999; see also Zwaan & Yaxley, 2004) and for explicitly stated, rather than implied, information in a text (Lincoln et al., 2007). For example, when a sentence explicitly describes an object's shape (e.g., "A deflated balloon was in the package") compared to when the shape is implied (e.g., "A balloon was in the package"), a right hemisphere advantage is apparent (Lincoln et al., 2007). Thus, previous research suggests that the right hemisphere has an advantage for processing information that is easily visualized.

Because research shows that individuals generate perceptual representations of information as they read a text, it is likely that participants in the current study visualized information about the product mentioned during the reading of these slogans. For example, when presented with the brand "Tostitos" followed by the literal slogan "This salsa is made with crisp vegetables", participants may have easily and quickly visualized a bowl of salsa with chunks of vegetables. However, when the brand was followed by the metaphoric slogan "It's a garden with a lid", visualization may have been more difficult because of the ambiguity of the metaphor (McQuarrie & Phillips, 2005). Therefore, the recognition of explicitly described objects tends to be associated with right hemisphere processing and it is possible that increased visualization of the product could have contributed to the right hemisphere advantage found for the literal slogans.

Given that familiar brands were presented with both the metaphoric and literal slogans in the current study, and that these two types of slogans were processed differently in the right hemisphere, these findings suggest that the type of slogan used to advertise products is extremely important. These results suggest that even if a company has a very familiar brand (such as "Tostitos"), when a metaphor is used to describe the product, consumers will likely take longer to process the information in the right hemisphere. This finding suggests that consumers may not always easily associate a brand with a metaphor. In other words, consumers may struggle to visualize the product, as described in the metaphor, even though they are quite familiar with the brand. This finding is

consistent with previous research suggesting that metaphoric advertisements are more difficult to comprehend than literal advertisements (Childers & Houston, 1984; DeRosia, 2008; Giner-Sorolla, Garcia, & Bargh, 1999; Singh, Lessig, Kim, Gupta, & Hocutt, 2000; Sojka & Giese, 2006). The current finding expands upon previous research by demonstrating that even when a familiar brand is presented with a metaphoric slogan, consumers may still find comprehension of the metaphor difficult. Specifically, when consumers are presented with the following information, “Tostitos: This salsa is made with crisp vegetables”, there is greater activation in the right hemisphere compared to “Tostitos: It’s a garden with a lid”. In other words, despite the fact that the identical, familiar brand was presented in both conditions, consumer processing is quite different in the right hemisphere. Although previous marketing studies have shown the importance of brand familiarity over advertisement context (Holden & Vanhuele, 1999; Mandler, 1980), the current results expand on this idea and suggest that advertisement context is also important in consumers’ implicit processing. This finding has implications for marketers given the association of the right hemisphere with emotions (e.g., Calvo and Nummenmaa, 2007; Jones, 1980, 1982). Perhaps the ability to easily visualize the product when presented with a literal advertisement in the right hemisphere, combined with consumers’ familiarity for a brand, elicits an emotional response during advertisement comprehension.

6.2 Purchase Intent of Advertised Products

A secondary purpose of the current study was to investigate how the familiarity of a brand influences purchase intent. In the current findings, metaphoric slogans did not receive higher purchase intent ratings than literal slogans. Although this was an unexpected finding and is inconsistent with previous marketing studies (McQuarrie & Mick, 1996; McQuarrie & Phillips, 2005), it provides new insight into the influence of brand familiarity on the persuasiveness of metaphors. The majority of previous marketing studies do not examine familiar brand names in the context of metaphoric messages, so it was previously unclear how the combination of these factors would influence consumers’ purchase decisions. In fact, previous findings that tested advertisements without a brand name or with a fictitious brand name found that metaphors increased advertisement persuasion (e.g., McQuarrie & Phillips, 2005; Toncar & Munch, 2001; Toncar & Munch, 2003). Thus, suggesting that the inclusion of a metaphor is critical for increased persuasion of advertised products. Interestingly, the current study did not find that metaphors increase purchase intent. This finding is consistent with the facilitation results in the right hemisphere, which showed greater activation for literal than for metaphoric slogans when a familiar brand was included. This finding is also consistent with previous research showing that brand familiarity is important for purchase decisions (e.g., Bogart & Lehman, 1973; Holden & Lutz, 1992; Holden & Vanhuele, 1999). Therefore, when a familiar brand name is presented in the context of an advertisement slogan, the use of a metaphor may be less influential than the brand name, itself.

6.3 Left Hemisphere Involvement in Purchase Decisions

Interestingly, the purchase intent results show that metaphoric slogans received higher purchase intent ratings when targets were presented to the left hemisphere compared to the right hemisphere. These results suggest that advertisement text is more likely to be visualized in the right hemisphere, whereas purchase decisions are more likely to be activated in the left hemisphere. These findings are likely due to the analytical nature of the left hemisphere (e.g., Jones, 1980, 1982) and suggest a key difference between the cognitive processes involved when reading text in advertisements (as reflected in the facilitation results of the current study) versus making a purchase decision. These findings suggest that when consumers read a print advertisement in a magazine (in other words, when consumers are not yet making an immediate purchase decision), they may activate different implicit processes than when consumers decide which product to purchase at a store. Given this is one of the first studies to examine hemispheric differences with regard to purchase intent of advertised products; future research should more closely investigate this topic. For example, new studies are needed to investigate how consumers make purchase decisions about stimuli that are immediately presented to either the left or right hemisphere (rather than at the end of the experiment as in the current study).

7. Marketing Implications

The current findings make several valuable contributions to the field of marketing and consumer behavior. First, by examining the activation of the cerebral hemispheres during advertisement comprehension, this research more closely examines the *implicit* processing that occurs and provides new insight into how consumers process advertisement content. Although the majority of consumer research methodologies employ explicit techniques to measure the impact of different advertisements, the current findings provide evidence for critical implicit processes that occur at a consumer’s subconscious level. These implicit processes have been shown to influence consumers’ perceptions of products and brands. Prior to this research study, brand familiarity was thought to be a

critical component of consumer choice, specifically used to promote liking and attention (Janiszewski, 1993). The current research suggests an added value of brand familiarity by demonstrating how these behavioral components are derived in the cerebral hemispheres. Second, the current research findings suggest an important role of product visualization during advertisement exposure and the influence of brand familiarity on advertisement comprehension and purchase intent. Lastly, the current findings introduce a role of the left hemisphere when consumers make purchase decisions. In conclusion, by better understanding how brand familiarity and advertisement slogans are processed in the brain, marketers can gain an edge in the market place by creating more effective advertisements that optimize consumers' implicit processing during advertisement comprehension.

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Table 1. Example of metaphor, literal, neutral, and filler slogans with corresponding brand names and targets

Condition	Brand name	slogans	Target word
Metaphor	Tostitos	It's a garden with a lid.	Fresh
Literal	Tostitos	This salsa is made with crisp vegetables.	Fresh
Neutral	Jose Quervo	The perfect margarita.	Fresh
Filler	Jergens	Science you can touch.	Scort

Table 2. Mean response times (in ms) and mean accuracies (in percent correct) for metaphor, literal, and neutral slogans by visual field-hemisphere

Condition	Visual field-Hemisphere			
	rvf-LH		lvf-RH	
	RT	AC	RT	AC
Metaphor	510 (11.12)	94 (.95)	543 (12.09)	93 (1.11)
Literal	511 (10.51)	93 (1.03)	527 (11.44)	92 (1.06)
Neutral	530 (11.97)	91 (1.07)	548 (12.71)	91 (1.22)

Note: Response times are abbreviated RT and accuracies are abbreviated AC. Right visual field-left hemisphere is abbreviated: rvf-LH and left visual field-right hemisphere is abbreviated: lvf-RH. Values in parentheses represent standard errors.

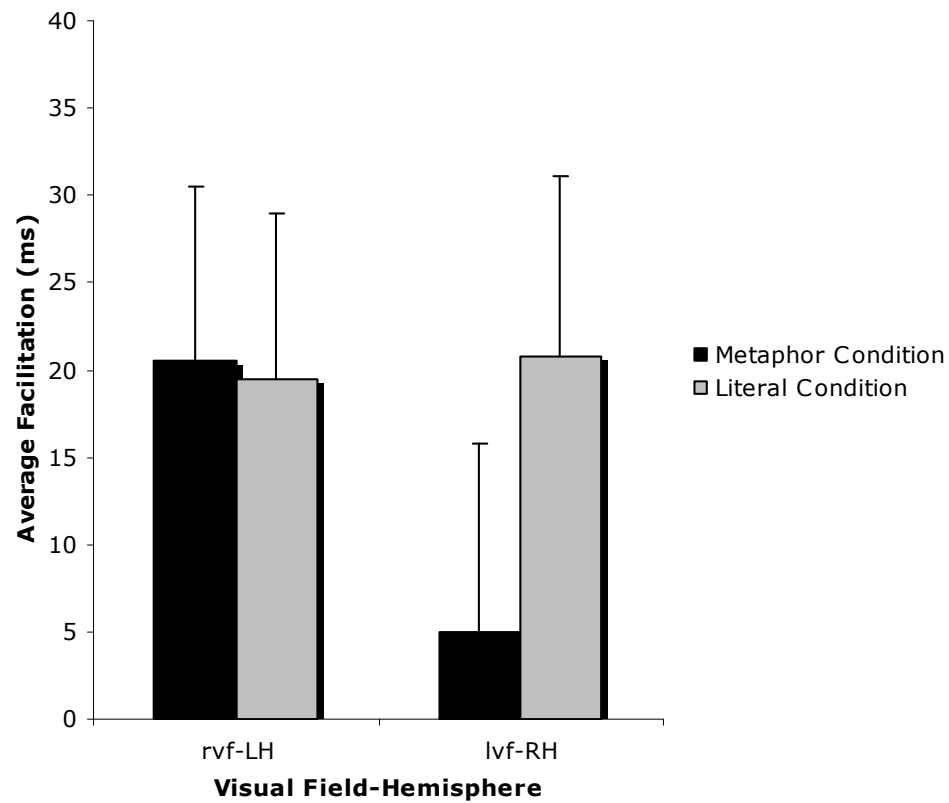


Figure 1. Average facilitation (in ms) for the metaphor and literal conditions by visual field-hemisphere

Note: Right visual field-left hemisphere is abbreviated: rvf-LH and left visual field-right hemisphere is abbreviated: lvf-RH.

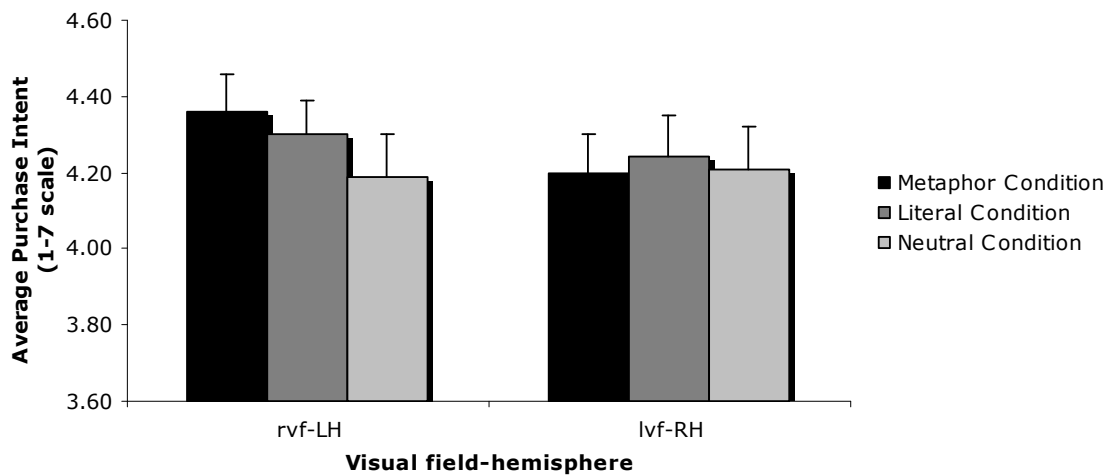


Figure 2. Average purchase intent (1-7 rating scale) for the metaphor, literal, and neutral conditions by visual field-hemisphere

Note. Right visual field-left hemisphere is abbreviated: rvf-LH and left visual field-right hemisphere is abbreviated: lvf-RH.