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What makes creative advertisements memorable? The role of insight

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Abstract

Sudden insight is often observed during creative problem solving and studies have suggested that advertisements can likewise evoke an insight experience. To date, however, there is limited empirical evidence on whether advertisements can trigger ideational insight, and, if so, whether such insight plays a role in advertising memorability. This study aimed to explore the insight experience evoked by advertisements and to examine the role of such experimentally-induced insight in predicted memory and metamemory performance. Participants viewed standardized advertising images sequentially, with each image presentation being followed immediately by a second presentation either with or without a brief description of the advertising idea. Next, participants were asked to recall the three most impressive advertisements. Finally, participants were randomly divided to complete either immediate (5 minutes later) or delayed (3 days later) recognition tests and to provide retrospective confidence judgments (RCJs). Recall of creative advertisements was better than standard advertisements and most of them evoked insight. In addition, recognition accuracy was greater for creative advertisements relative to standard advertisements and metamemory performance as elicited through RCJs was enhanced. Further analyses confirmed the documented importance of insight for memory consolidation. The findings suggest that insight makes advertisements more memorable, especially those that are creative.

Key words: creative advertising; insight; memory; advertising effectiveness; metamemory

1 Introduction

In recent years creative advertising has had a remarkable impact in the creative industries and has attracted widespread interest amongst the public. Creative advertising bridges the gap between advertised products (including services, ideas and brands) and the target audience, helping the audience to communicate voluntarily with advertised products from various perspectives. Creative advertisements adopt numerous designs and performance techniques to refresh the audience's perception or to evoke emotions in a way that induces the audience's endorsement of the advertised product or concept (Ang & Low, 2000; El-Murad & West, 2004; Koslow, Sasser, & Riordan, 2003; Shirkhodaee & Rezaee, 2014; Smith & Yang, 2004; West, Kover, & Caruna, 2008). In other words, creative advertising is a carrier that implicitly conveys information, which often involves an unusual idea, some form of artistic expression and a novel performance.

Although there is still no consensus regarding how to define creative advertising, a review of the extant research indicates that there are two approaches to determining what is a creative advert. One approach is based on the evaluation of professionals, for example, whether an advertisement has received recognition in prestigious international competitions such as the Cannes Lions awards or the Clio awards; the other approach is based on the public's ratings of an advertisement's creativity. Professional evaluations seem to be more influential (see Kover, Goldberg, & James, 1995; Till & Baack, 2005), perhaps because they are widely acknowledged to have excellent validity by practitioners of creative advertising (e.g., Till & Baack, 2005).

1.1 Creative Advertising and Insight

Creative advertising often impresses the audience because of the novelty of the presented

concept or the advertisement's design or execution, but unusual characteristics and ingenious ideas can also make creative advertisements difficult to understand. This difficulty is like the mental "impasse" or "dead end" that a problem solver encounters when attempting to solve a creative problem that requires a hard-to-discover solution (e.g., Ohlsson, 2011). In general, if people persist in trying to comprehend the meaning of an advertisement through clues that are present and tips from others, they will experience an "Aha" moment, which is a sudden sense of deep understanding, accompanied by feelings of joy or surprise (Du, Zhang, Wang, Luo, & Luo, 2017). This kind of sudden understanding is typically referred to as "insight", both in the context of creative advertising and creative problem solving.

The term insight in advertising has been popularized by Fortini-Campbell (2001) in her book "*Hitting the sweet spot: How consumer insights can inspire better marketing and advertising*", which argues that account planners should be "insight miners" and that having this capacity is "one of the most important skills a planner can possess" (Baskin 2008, p. 49). Although insight has been scarcely examined in the previous advertising literature, there is a "community of practice" among account planners which highlights the importance of insight in advertising (e.g., Ariztia, 2015; Baskin 2008; Fallon & Senn, 2006; Hackley, 2003; Haley, Taylor, & Morrison 2014; Hall, 2002; Parker et al., 2018; Siegler, 2000; Zaltman 2014). Despite the differences that may exist between insight in creative problem solving and insight in advertising (see Haley, Taylor, & Morrison 2014; Parker et al., 2018), the underpinning processes associated with both types of insight seem to be broadly similar because they entail the discovery of a hidden "truth". Insight in advertising typically relates to human truths about ordinary audiences and their relationship with a brand or product that can be used to inspire creative advertising (Fallon & Senn 2006; Steel 1998;

Parker et al., 2018). Nevertheless, the “truth” revealed by advertising insight is not construed as just any “truth”, but as a specific one: insight is buried deep in consumers and becomes self-evident after a process of professional work and intuition. In other words, what insight makes visible is a true fact or feeling of the consumer that even they did not know until it was made clear via professional operations (Parker et al., 2018).

For advertising, insight denotes the campaign process of successfully connecting consumers’ “inner truths” with the good qualities of the advertised product and thus can provide a depth of understanding “into the way people think, feel and behave in relation to brands” (see Parker et al., 2018). To offer such an insight to target audiences, practitioners need to establish connections between different kinds of actors involved in the campaign. Specifically, two types of connections or associations are particularly common. One is the “deep” truth that the insight reveals, which connects different individuals with some common experience regarding themselves (Fallon & Senn, 2006; Parker et al., 2018); the other is the connection between one aspect of the consumer and one particular attribute or quality of the advertised product, brand or service. Owing to these “hidden truths” and “implicit associations”, the target audience would likely experience insights when a true fact or feeling about them or the connection between them and the product, brand or service that is familiar and credible jumps from their unconsciousness into their consciousness. Accordingly, a high-quality insight is required in advertising to be able to make the advertised product, brand or service distinct from others (at least within the same category). This insight is achieved by placing a strategic idea into the message proposition, which would be elevated as an attribute or benefit from the commodity to be effective in satisfying the target audience’s unmet needs (Parker et al., 2018). Indeed, from an analysis of semi-structured, face-to-

face interviews with 20 account planners employed across 12 advertising agencies, Parker et al. (2018) identified the role of practitioner-based advertising insight in building advertising message propositions. They also argued that insight is the foundation for creative ideation in account planning and is a vehicle to direct new advertising messages within a brand's existing positioning or to assist in identifying how a brand may be reoriented for competitive advantage.

It is also acknowledged that practitioner-based advertising insights as mentioned above would have some differences to the insights arising in advertising audiences. A practitioner's insight is more about the campaign and design process associated with an advertisement, whereas an audience's insight is more about the understanding process associated with an advertisement. Although a practitioner's insight would likely make an audience experience such insight too, it is also possible that an advertisement that is considered to have no practitioner-based insight could nevertheless trigger an audience's insight. This idea is corroborated by recent findings using non-advertising pictures. For example, insight in participants has been successfully induced using a task that comprises the recognition of a hidden object (Ishikawa, Toshima, & Mogi, 2019), using a task that involves viewing an uninterpretable caption followed by an interpretation of an object from an unusual perspective (Amir, Biederman, Wang, & Xu, 2013) and using a task that requires the viewing of degraded images of real-world pictures (wherein the underlying images are camouflaged) that accompanies the brief exposures to the original images (Ludmer, Dudai, & Rubin, 2011).

In sum, creative advertisements do not simply convey information about a product or brand or involve unidirectional affective expression, but they rather engender a bidirectional interplay between the advertising product or brand and the audience with respect to the conveyed

idea. In this context, the conveyed idea in creative advertisements seems more strategically mysterious, implicit or innovative than it does in standard or common advertisements, enabling creative advertising to be more likely than standard advertising to evoke a moment of insight.

1.2 Memory Effectiveness of Creative Advertising

Almost all advertisements are designed for maximum effectiveness (Higie & Sewall, 1991; Till & Baack, 2005). The *psychological effectiveness* of advertising – often used as a proxy for advertising effectiveness – is defined as the extent to which an advertisement makes the target audience attend to and remember information about the product or service, change their attitude to it or experience appeal-congruent emotions (Fennis & Stroebe, 2010). Creative advertising may establish a positive impression of the brand and encourage individuals to make an immediate decision to support or buy the advertised product or service (Lavidge & Steiner, 1961). There is, indeed, substantial evidence that advertising can attract audiences (Campbell, 1995; Pieters & Wedel, 2004), enhance product concern (Opree, Buijzen, Van, Reijmersdal, & Valkenburg, 2014), improve brand memory (Keller, 1987; Sajjacholapunt & Ball, 2014), optimize brand attitude (Mackenzie, Lutz, & Belch, 1986; Percy & Rossiter, 2010) and boost purchase intentions (Dehghani & Tumer, 2015; Kover, Goldberg, & James, 1995).

Memories for advertised brands, products and ideas can have a profound effect on audiences' attitudes and purchase intentions. Indeed, previous studies have demonstrated that people's memory for advertisements is typically a better predictor of market share than most other marketing data (e.g., Beriain, 2013). This impact of memory may be explicit or implicit, but there is no denying the significance of memory for advertising in establishing subsequent attitudes to products or brands and increasing positive purchase decisions. Indeed, the importance of memory

effectiveness in advertising has been illustrated by the upgrading from the AIDA (Attention → Interest → Desire → Action) model to the AIDMA (Attention → Interest → Desire → Memory → Action) model, wherein the role of memory is highlighted (e.g., Barry, 1987).

Methodologically, two approaches are commonly used to assess memory for advertisements: recall and recognition tests. There are no obvious advantages or disadvantages between recognition and recall in determining advertising effectiveness (Krugman, 1986), with recognition indicators tending to be particularly useful for assessments of how advertisements are perceived, whereas recall tests seem a better method for capturing the deeper processing of advertisements. Many researchers do, in fact, recommend combining recall and recognition tests (Baack, Wilson, & Till, 2008; Wilson & Till, 2008) to capitalize upon their complementary strengths (Stapel, 1998).

To conclude, existing data indicate that creative advertisements, when compared with standard advertisements, show a memory advantage, being more easily stored and maintained in long-term memory (Sasser & Koslow, 2008; Smith, Chen, & Yang, 2008; Till & Baack, 2005). Indeed, in certain situations a creative advertisement can rapidly activate an individual's purchase intentions or lead through seemingly unconscious processes to an immediate purchase decision (Smith et al., 2008).

1.3 Aim of the Present Study

The aim of the present study was threefold. First, we wanted to verify that creative advertisements are more likely to evoke insight than standard advertisements. To generate creative advertisements for the study we followed the dominant approach in the literature of relying on professional evaluations and we therefore used international, award-winning advertisements as our

creative advertising stimuli (see Kover, Goldberg, & James, 1995; Till & Baack, 2005). In contrast, our standard advertisements had not won awards. Although previous studies have revealed that creative pictorial advertisements involve more practitioner-based insight than standard advertisements (Hackley, 2003; Parker et al., 2018), which implies that creative pictorial advertisements should also be more likely to induce insight in an audience, no empirical study has yet been conducted to test this prediction. Examining this prediction is practically meaningful so that marketing researchers can understand the effectiveness of creative advertisements from an audience perspective.

Second, previous studies indicate that creative advertisements have a memory advantage over standard advertisements. However, few studies have been conducted to determine such superiority in cultures other than the USA. In addition, most studies of memory for advertising have focused on recognition or recall, although a few have also examined the "metamemory" characteristics of advertising, which is important for advancing a comprehensive understanding of advertising effectiveness. In general, metamemory relates to dynamic processes that are involved in monitoring and controlling the encoding, storage and retrieval of information (Chua et al., 2009; Flavell, 1979; Nelson, 1984) and can be assessed using various indicators. To our knowledge, only two studies have examined the metamemory characteristics of pictorial advertisements and demonstrated that not all types of advertisements have the same metamemory characteristics (Stacy, Zogg, Unger, & Dent, 2004). For example, Norris (1996) found differences between the metamemory characteristics of three advertisements embedded in a broadcast program using a seven-point scale. Accordingly, we wanted to validate whether creative advertisements compared to standard advertisements generate superior immediate and delayed memory performance

(measured using recognition and recall tests) as well as enhanced immediate and delayed metamemory performance (measured using retrospective confidence judgments – RCJ), thereby extending the measures of advertising memory from traditional recall and recognition tests to a metamemory test.

In the study that we report the immediate measures of memory and metamemory were taken five minutes after advertisements were observed and the delayed measures of memory and metamemory were taken after three days. We used RCJ to examine metamemory because we were most interested in participants' retrospective judgments about the accuracy of their memories for remembered advertisements. RCJ is appropriate in this context as the judgment is made after the memory test, whereas feeling-of-knowing (FOK) judgments are usually assessed prior to the memory test (Perrotin et al., 2007; Mengelkamp & Bannert, 2010). RCJ has been shown to provide a reliable indicator of participants' confidence in their responses (e.g., Perfect & Rollins, 1999) and has previously been used in studying the metamemory characteristics of creative advertising, with participants being asked to rate their confidence in memories for recognized advertising images (e.g., Ludmer et al., 2011; Smith & Squire, 2018).

Finally, little is currently known about why creative advertisements appear to be more memorable than standard advertisements, which is a core focus of the present study. Although the special characteristic of creative advertising to engage the audience and induce insight has been commented on in academic circles, with such induced insight also being widely acknowledged to play a role in the memory advantage for creative advertisements, no study has empirically investigated this issue to date. This is a surprising gap in our knowledge given that both historical and more recent research suggests that individuals often have an excellent memory for a variety of

materials that tend to trigger insight. For instance, Kohler (1917) observed that animals, like people, can experience insight, which increases their memory for relevant materials because of the deeper impression that is made. Auble, Franks, and Soraci (1979) reported that people's recall for sentences is better if the sentences are initially incomprehensible but they are eventually comprehended (i.e., they give rise to insight), as compared with sentences that are understood from the outset. This latter memory superiority effect for insightful interpretations of information was replicated and extended by Ludmer, Dudai, and Rubin (2011), who used degraded camouflage images (whereby a pattern of the image is initially incomprehensible) and functional magnetic resonance imaging (fMRI) measures to show that long-term retention and recognition were better for images that induced perceptual insight versus images that did not. Interestingly, the amygdala activity elicited during the moment of induced insight could be used to predict with impressive reliability which images would remain in memory one week later. Lakshmanan and Krishnan (2011) showed that the initial trial of a product can produce an insight experience and that this experience is conducive to enhancing memory of product usage for individuals. More recently, Danek, Fraps, Muller, Grothe, and Öllinger (2013) observed that participants were more likely to recall pictures of magic tricks that triggered insight than those that did not.

Collectively, these aforementioned studies suggest that insight conveys a memory advantage in the case of a variety of materials. It therefore seems plausible to hypothesize that the memorability of creative advertising is frequently underpinned by some sort of insight experience. As previous researchers have stressed (e.g., Ariztia, 2015; Parker et al., 2018), exploring the roles of insight in the memory effectiveness of advertisements across different levels of creativity is not only relevant in terms of unpacking the empirical relation between market professionals,

advertising audiences and the production of social and cultural entities, but is also particularly relevant as it involves making a contribution to a wider effort to understand market professions in contemporary society, especially in relation to business and commercial activities.

With respect to the aims of the present study, we used existing findings to formulate three specific hypotheses, as follows: (1) that creative advertisements will be more likely to induce an insight experience than standard advertisements; (2) that creative advertisements will show an advantage for both memory and metamemory compared to standard advertisements; and (3) that advertisements that evoke a moment of insight will be more memorable, which will be particularly the case for creative advertisements.

2 Method

2.1 Participants

Eighty paid university students were recruited and randomly divided into two groups. One group (n = 40, female n = 23; M_{age} = 19.8 years, range = 17 to 24 years) were tested for their memory of the presented advertisements after five minutes and the other group (n = 40, female n = 22; M_{age} = 18.8 years, range = 18 to 22 years) were tested after three days. All participants were healthy and right-handed, with normal or corrected-to-normal vision. The study was approved by the institutional ethical committee.

2.2 Design

A 2 (creativity: creative vs. standard) × 2 (insight: present vs. absent) × 2 (advertisement type: commercial vs. non-commercial) × 2 (test time: immediate vs. delayed) mixed design was used. The between-subject variable was test time, whereas the within-subject variables were creativity, insight and advertisement type. The dependent variables were memory effect and

metamemory effect, with the memory effect indicators being recall percentage and recognition accuracy and the metamemory effect indicator being RCJ.

2.3 Materials

Advertising stimuli for the study session. During the study session participants viewed 96 printed pictorial advertisements, of which 48 were creative advertisements (i.e., award-winning) and 48 were standard advertisements (i.e. not award-winning), as recommended by previous studies (e.g., Kover et al., 1995). There were an equal number of commercial and non-commercial advertisements in both the set of creative and standards items. All advertisements were presented as 300×400 pixel black-and-white images.

Two versions of both the creative and standard advertisements were presented to participants. Initially, picture-only advertisements were presented, and participants were simply asked to think about the meanings or ideas that the advertisements conveyed. Subsequently, the same advertisement was presented together with a brief description that introduced the intention, belief or idea behind the advertisement. These brief descriptions were provided as way to ensure that the participants entirely understood the advertisements, with the description functioning to trigger insight (i.e., an "insight experience") for those advertisements where there was little or no initial understanding. The appropriateness of this latter manipulation for triggering insight has been validated by previous studies (e.g., Amir, Biederman, Wang, & Xu, 2013). The lengths of the descriptions (≤ 9 words) were similar for the creative advertisements (M = 7.81, SD = 1.25) and the standard advertisements (M = 7.79, SD = 1.41), $t(94) = -.08$, $p = .939$, Cohen's $d = .02$.

Analysis of familiarity data from an independent sample of 60 homogeneous participants excluded the possibility that differences in stimulus familiarity could bias the results as the set of

creative advertisements and the set of standard advertisements received similar familiarity ratings using a nine-point scale, $t(94) = -.16$, $p = .872$, Cohen's $d = .03$ (creative advertisements: $M = 5.43$, $SD = .33$; standard advertisements: $M = 5.42$, $SD = .28$). As expected, however, participants' ratings of the creativity of the two sets of advertisements were significantly different using a nine-point scale, $t(94) = 36.86$, $p < .001$, Cohen's $d = 7.43$ (creative advertisements: $M = 6.30$, $SD = .22$; standard advertisements: $M = 4.55$, $SD = .25$).

Advertising stimuli for the recognition test session. The recognition test involved the presentation of a total of 96 pictorial advertisements, 48 of which were "old" images that had been presented during the study session and 48 of which were "new" images that were created as distractors for the recognition session. The 48 old images involved an equal number of creative and standard advertisements and an equal number of commercial and non-commercial advertisements. The construction of the new images was inspired by a method pioneered by Smith and Squire (2018) that involves creating novel variants of old images by systematically removing or replacing certain components. This process establishes new images that resemble the old images conceptually and in terms of their content and organizational structure whilst also being different in terms of involving omitted or replaced elements. Using this method, we transposed the 48 remaining old advertisements that had been presented during the study session into new variants. The new pictorial advertisements comprised an equal number of creative and standard advertisements and an equal number commercial and non-commercial advertisements.

2.4 Procedure

The experimental procedure was programmed and implemented in E-prime 2.0 software. The stimuli were presented on a 21-inch monitor (1024×768 resolution, 85 Hz refresh rate) with a

white background. Participants were seated approximately 75 cm away from the monitor screen and were asked to fixate on the center of the screen. Participants completed some practice trials before the formal experiment commenced to familiarize themselves with the experimental procedure. The formal experiment involved four phases: study session, recall test session, interference session and recognition test session. The full procedure is illustrated in Figure 1.

Study session. The study session consisted of 96 trials. At the beginning of a trial a fixation cross was displayed in the center of the screen for 300 ms, which was followed by a 200 ms pause and then an advertisement image was presented for 8 s; participants were asked to consider the theme of the advert whilst viewing it. Stimulus offset was followed by a 200 ms pause and then the same image was presented again for 6 s, accompanied by a brief description of the idea behind the advertisement. Participants were required to press a key to indicate how they had processed the advertisement. Key presses were automatically recorded by the E-Prime 2.0 software.

If the idea displayed when the advertisement was re-presented coincided with what the participant had thought (i.e., they transitioned from “correct inference” to “inference confirmed”, reflecting no moment of insight; see Luo & Niki, 2003, p. 317) then they were instructed to press the “1” key. If the participant had been unable to work out the idea behind the advertisement but understood it as soon as the description was presented (i.e., they transitioned from “puzzled” to “understanding”, reflecting an insight experience; see Bowden & Jung-Beeman, 2003, p. 732) then they were instructed to press the “2” key. If the participant’s idea about the advertisement proved to be inconsistent with the description displayed when the advert was re-presented, but they found the description convincing (i.e., they transitioned from “incorrect inference” to

"cognitive conflict" to "understanding", reflecting an insight experience; see Sandkuhler & Bhattacharya, 2008) then they were instructed to press the "3" key. If the participant's idea about the advertisement proved incorrect and they did not understand the description provided or found it unconvincing (i.e., they transitioned from "incorrect inference" to "cognitive conflict" to "incomprehension", reflecting no insight experience; see Schooler, Ohlsson, & Brooks, 1993, p. 170) then they were instructed to press the "4" key. If the participant had been unable to work out the idea behind the advertisement and then did not understand the description provided (i.e., they transitioned from "puzzled" to "incomprehension", reflecting no insight experience; see Luo, Niki, & Phillips, 2004, p. 2014) then they were instructed to press the "5" key. The trial ended with a blank screen that was displayed for a random duration between 200 and 600 ms. The stimuli were presented in a random order for each participant.

[INSERT FIGURE 1 HERE]

Recall test session. All participants were asked to recall the three advertisements that had most impressed them and describe their content. These descriptions were used to score participants' recall performance.

Interference session. Pictures are commonly regarded as more memorable than words, so to avoid ceiling effects that might make it difficult to detect differences between memories of different types of pictures we included an interference session as part of our procedure. Immediately following the recall test session, participants were asked to perform a commonly used interference task, which involves repeatedly subtracting three from a number given at the

start of the procedure until the result is zero or less (or five minutes have elapsed). This task was employed to distract participants and prevent them from rehearsing the images that they had seen during the study session.

Recognition test session. Half the participants (the immediate group) performed the recognition test immediately after the five-minute interference task and half the participants (the delay group) performed the recognition test after returning three days later, ostensibly to complete another non-specified task.

The recognition test session involved participants being shown a subset of 48 old advertisements that had appeared in the study session (see the materials section for details) together with 48 new advertisements (again, see the materials section for details of how these new advertisements were created). The presentation of the 96 old and new advertising images was independently randomized for each participant.

At the beginning of each recognition trial a fixation cross was displayed in the center of the screen for 300 ms, which was followed by a 200 ms pause involving a blank screen that was followed by the presentation of the advertisement. Participants were asked to press the 'F' button if they believed that the advertisement had appeared in the study session and the 'J' button if they believed that the advertisement had not appeared in the study session. The advertising image disappeared once the participant had responded. Response accuracy was automatically recorded by the E-Prime 2.0 software.

After making a recognition judgment, participants rated their confidence in it using a five-point scale (0% confidence; 25% confidence; 50% confidence; 75% confidence; 100% confidence). Participants registered their RCJs by pressing a key. After making an RCJ on a

particular trial a blank screen was then presented for a random duration between 200 and 600 ms before the next trial commenced.

3 Results

3.1 Recall Test

In the recall test participants were asked to identify the three advertisements that they had found to be the most impressive. A total of 240 advertisements were nominated. As Figure 2 shows, creative advertisements were nominated more frequently than standard advertisements, $\chi^2 = 63.44$, $p < .001$ (creative: 84.17%, $n = 202$; standard: 15.83%, $n = 38$). In addition, advertisements that prompted a moment of insight were more likely to be selected than those that did not, $\chi^2 = 12.09$, $p = .001$ (insight present: 57.08%, $n = 137$; insight absent: 25.00%, $n = 60$). However, commercial and non-commercial advertisements were equally likely to be selected, $\chi^2 = .01$, $p = .920$ (commercial: 50.42%, $n = 121$; non-commercial: 49.58%, $n = 119$).

3.2 Recognition Test

To differentiate and classify the participants' five different thinking patterns during the study session, they were asked to press the appropriate key according to the given instructions. However, not all participants reported all five responses types, resulting in missing data for these individuals. All data for these participants were excluded from the analysis, leaving a final sample of 67 participants. Table 1 shows recognition performance in terms of accuracy. It should be noted that the data presented in Table 1 collapse insight responses across two categories, that is: (i) insight arising when people transitioned from being "puzzled" about an advertisement to "understanding" it; and (ii) insight arising when people transitioned from an "incorrect inference" about the meaning of an advertisement to "understanding" it. We present additional analyses in

our Supplementary Materials to support the behavioral equivalence of these two categories of insight.

Recognition accuracy. Table 1 suggests that recognition accuracy varied as a function of advertising creativity, insight, advertisement type and test time. To examine the recognition accuracy data for statistically significant effects we conducted a 2 (creativity: creative vs. standard) × 2 (insight: present vs. absent) × 2 (advertisement type: commercial vs. non-commercial) × 2 (test time: immediate vs. delayed) mixed-design ANOVA. The full set of outcome results for this ANOVA are presented in Table 2 for ease of reference.

The analysis revealed that recognition accuracy was significantly better in the immediate test than the delayed test, $F_{(1,65)} = 62.36$, $p < .001$, $\eta_p^2 = .49$. Creative advertisements were also significantly more likely to be recognized correctly than standard advertisements, $F_{(1,65)} = 14.47$, $p < .001$, $\eta_p^2 = .18$. In addition, there was a significant main effect of insight induction, $F_{(1,65)} = 8.21$, $p = .006$, $\eta_p^2 = .11$, whereby advertisements that prompted insight were better recognized than those did not.

An examination of interaction effects revealed that there was a significant two-way interaction between creativity and advertisement type, $F_{(1,65)} = 34.21$, $p < .001$, $\eta_p^2 = .35$. Simple main effects analyses showed that there was significantly greater recognition accuracy for non-commercial than commercial advertisements when they were creative, $F_{(1,65)} = 5.95$, $p = .017$, $\eta_p^2 = .08$, but that this pattern was reversed for standard advertisements, with greater recognition accuracy for commercial advertisements than non-commercial advertisements, $F_{(1,65)} = 25.07$, $p < .001$, $\eta_p^2 = .28$. There were also significant, complex three-way interactions between creativity, insight and test time, $F_{(1,65)} = 10.06$, $p = .002$, $\eta_p^2 = .13$, and between creativity, insight and

advertisement type, $F_{(1,65)} = 14.00$, $p < .001$, $\eta_p^2 = .18$.

[INSERT FIGURE 2 HERE]

3.3 RCJ

A 2 (creativity: creative vs. standard) × 2 (insight: present vs. absent) × 2 (advertisement type: commercial vs. non-commercial) × 2 (test time: immediate vs. delayed) mixed-design ANOVA was conducted to probe potential differences in RCJ (Table 1). The analysis indicated that RCJ was lower for the delayed test than the immediate test, $F_{(1,65)} = 13.46$, $p < .001$, $\eta_p^2 = .17$, and lower for standard advertisements than creative advertisements, $F_{(1, 65)} = 28.30$, $p < .001$, $\eta_p^2 = 0.30$. No other effects were significant (all *p*s > .05, all effect sizes < .1).

[INSERT TABLE 1 HERE]

3.4 The Effect of Insight Induction on Recognition Responses

Our final analysis aimed to examine the effect of insight induction on subsequent recognition performance for old advertisements that were seen during the study session versus new advertisements that only appeared during the recognition test session but were variants of advertisements that had been presented at study. The independent variable – insight induction (insight present vs. insight absent) – was transformed into a dependent variable for a reverse analysis. To clarify the nature of the scoring of the data for this analysis it is important to understand the two distinct types of responses to presented items that arose in the recognition test

session. First, “true” responses occurred when the participant either correctly recognized old advertising images that had previously been presented in the study session or else when they correctly rejected new advertising images that had not previously been presented. Second, “false” responses arose when the participant either incorrectly failed to recognize old advertising images that had previously been presented in the study session or else when they incorrectly recognized new advertising images that had not previously been presented. Furthermore, for each type of response (true or false) in relation to each type of advertising image (old or new) it is possible to determine the percentage of such responses for which the associated image presented at study had induced an insight experience (insight present) relative to not producing an insight experience (insight absent). Note that for old items the image presented during the recognition test would have been identical to that presented at study whereas for the new items the image presented during the recognition test would have been a variant of the image presented at study.

[INSERT TABLE 2 HERE]

Calculating response percentages in the manner just described gives rise to the data presented in Table 3 for creative and standard advertisements in the immediate and delayed recognition conditions. In summary, these data depict the response type (true or false) in relation to each stimulus type (old or new) expressed as a percentage of the associated advertising images at study having induced an insight experience (insight present) relative to the total number of advertising images in that category at study that either did or did not produce insight (i.e., insight present + insight absent). Note that for this analysis we excluded images that during the study

phase had been responded to with keypresses “4” or “5”, which indicated a lack of comprehension of the presented adverting image.

[INSERT TABLE 3 HERE]

The data presented in Table 3 show that, irrespective of stimulus type (old vs. new), response type (true vs. false) or test time (immediate or delayed), responses were far more likely to arise from studied items that had induced insight for creative advertisements than for standard advertisements. In general terms this finding suggests a strong impact of insight induction for the memorability of creative advertisements relative to standard advertisements. Another aspect of the descriptive data that is worthy of comment is that for creative advertisements, when new items are presented during the immediate recognition session then the previous experience of insight appears to misdirect participants to falsely identify such items as having been previously seen. The same effect arises for standard advertisements but occurs in the delayed recognition session rather than the immediate recognition session. This “memory illusion” for new items therefore appears to reflect a complex interplay between the experience of insight during study, advertising creativity (creative vs. standard) and test time (immediate vs. delayed).

[INSERT TABLE 4 HERE]

To analyze the insight induction data relating to responses in the recognition session we conducted a 2 (creativity: creative vs. standard) × 2 (stimulus type: new vs. old) × 2 (response type:

false vs. true) × 2 (test time: immediate vs. delayed) mixed-design ANOVA (Table 4). Insight-induced responses were significantly more likely for creative advertisements than standard advertisements, $F_{(1,78)} = 2027.96$, $p < .001$, $\eta_p^2 = .96$, and for new stimuli than old stimuli, $F_{(1,78)} = 101.23$, $p < .001$, $\eta_p^2 = .57$. There was also an interaction between stimulus type and response type, $F_{(1,78)} = 20.25$, $p < .001$, $\eta_p^2 = .21$. Further testing showed that, for new stimuli there was no difference between true and false responses, $F_{(1,78)} = 2.65$, $p = .108$, $\eta_p^2 = .03$, whereas for old stimuli the true responses were more likely to be associated with induced insight than the false responses, $F_{(1,78)} = 26.01$, $p < .001$, $\eta_p^2 = .25$.

To qualify the relative contribution of insight for advertising memory effectiveness, we used a binary logistic regression analysis to explore the relationships between recognition responses (true vs. false), insight responses (insight present vs. insight absent) and advertising creativity types (creative vs. standard), with the recognition responses forming the dependent variable and the insight responses and advertising creativity types forming the independent variables. We found that the odds ratio of insight present in the correct answers was 1.20 times that of insight absent under delayed test, $OR = 1.20$, $p = .029$, 95% CI [1.02, 1.41], indicating that most of the advertisements were correctly recognized by the participants as they induced audience insight, irrespective of whether the advertisement was creative or not. Importantly, for creative advertisements, we found that they had an odds ratio 0.67 times higher than the standard advertisements for immediately correct answers, $OR = .67$, $p < .001$, 95% CI [.54, .83]. In addition, we also examined the relationship between recognition responses (true vs. false) and insight responses (insight present vs. insight absent) for creative and standard advertisements using a binary logistic regression analysis. The results showed that the odds ratio of insight present

for correct answers was 1.37 times higher than that for insight absent in creative advertising, *OR* = 1.37, *p* = .011, 95% *CI* [1.08, 1.75]. These finding indicate that creative advertisements are more likely to evoke an insight, and such an insight thence plays a key role in the memory effectiveness of these creative advertisements.

4 Discussion

The present study aimed to determine whether the insight arising during the viewing of creative advertisements (i.e., ones that had won international awards) plays a role in people's subsequent memory for those advertisements. Such insight experiences were measured by means of participants' self-reports, which is a standard method that has been employed effectively in research on creative problem solving (e.g., Danek et al., 2013; Salvi, Bricolo, Kounios, Bowden, & Beeman, 2016; Threadgold, Marsh, & Ball, 2018). Furthermore, the study investigated whether creative advertisements compared to standard advertisements (i.e., ones that had not won international awards) generate superior memory performance, as indexed using an immediate recall test as well as both immediate recognition and delayed recognition (i.e., three days after the study session). We were additionally interested in the impact of advertising creativity on people's metamemory in relation to their recognition decisions, as indexed using RCJ.

As expected, creative advertisements were recalled and recognized better than standard advertisements, regardless of the time delay, which is consistent with previous literature. Creative advertisements were also associated with higher RCJs than standard advertisements, indicating a metamemory superiority for creative advertising. More importantly, a detailed analysis revealed that self-reported insight experiences play an important role in superior memory for creative advertisements relative to standard advertisements as well as people's greater confidence in their

memory for such advertisements. These findings are of value for advertising design and for the development of experience-based marketing. In the following sections we discuss the three main findings further and examine their potential implications in greater detail.

4.1 The Roles of Insight on Memory for Advertisements

A key finding of the present research is our evidence that insight experiences play an important role in the storage, recall and recognition (immediate and delayed) of advertising images. That is, our results show very clearly that the advertisements that induce a moment of insight are remembered better. There was also a close association between advertising creativity (the creativity manifested in advertising) and the triggering of an insight experience in that creative advertisements were more likely to prompt a moment of insight. In this respect our findings confirm the role of induced insight in facilitating memory recognition for creative advertisements. We return to a possible explanation for the memory benefits arising from creative advertisements below after first considering in more detail the way in which such advertisements are processed.

One key observation is that creative advertisements are frequently difficult to understand on initial inspection. To derive such an understanding often necessitates discovering the creative idea or concept that is hidden in the advertisement, which is facilitated through the activation of a relevant schema or script that is stored in memory. Through effective schema activation the individual will move toward a complete gestalt understanding of the advertisement’s meaning after an initial phase of minimal understanding. This process requires cognitive effort to switch one’s initial mindset to a more productive mindset, which is a process that is similar to the restructuring of representations that is observed in insight studies of creative problem solving. In

other words, participants have to “restructure” mental representations derived from an initial impression of a creative advertisement so that they can successfully escape from the impasse-like state induced by incomprehension or misunderstanding and eventually understand these advertisements.

Representation-related deep understanding or restructuring is often reported to improve long-term memory for information (Auble et al., 1979; Danek et al., 2013; Ludmer et al., 2011; Wills et al.; 2000; Shen et al., 2019). For example, Kizilirmak, Galvao, Imamoglu, and Richardson-Klavehn (2015) showed that the process of generating insight solutions to problems improved long-term memory for those solutions, as in the future individuals were more readily able to solve such problems. One possibility for why insight might drive better memory for information relates to the positive affect that accompanies full understanding. Indeed, previous studies have documented that sudden understanding of something that previously seemed incomprehensible (Auble et al., 1979) is often accompanied by happiness or a release of tension (Shen, Yuan, Liu, & Luo, 2016; Topolinski & Reber, 2010, and has been found to boost long-term memory for the problem and its solution (Danek et al., 2013; Kizilirmak et al., 2015; Kizilirmak, Wiegmann, & Richardson-Klavehn, 2016; Kizilirmak et al, 2019). In this way, a person who abruptly understands a creative advertisement or an idea behind it will experience a similar positive affective state to that accompanying insight-based solutions to problems. We note that this account of the memorability of creative advertisements is also supported by recent findings demonstrating the robust activation arising in both the amygdala, which is associated with emotion processing, and the hippocampus, which is associated with memory processing (see Balderston, Schultz, & Helmstetter, 2011) during moments of insight in problem solving (e.g., Yu, Zhang, Fan,

Luo, & Zhang, 2019; Lumder et al., 2011; Kizilirmak et al, 2019).

Although, we observed that creative advertising is more likely to induce insight than standard advertising, the standard advertisements nevertheless also elicited some insights (e.g., about 15% of the self-rated responses were designated as “insight-present”). This is because standard advertisements also require the involvement of creativity and creative expression, although they are considered less creative than award-winning advertisements. According to previous studies (e.g., Shen et al., 2013; Knoblich et al., 2001), insight is a product of the participant’s knowledge or experience and the idea conveyed by stimulus item, which enables standard advertisements to engender insight experiences for some individuals (Shen et al., 2018; Jarman, 2014).

4.2 Memory Advantages for Creative Advertising

As hypothesized, our study also found that creative advertisements were more memorable than standard advertisements, confirming previous observations (e.g., Ang, Lee, & Leong, 2007; Baack et al., 2008; Sheinin, Varki, & Ashley, 2011; Till & Baack, 2005; Smith et al., 2007). Creative advertising has many characteristics that are different from standard advertisements, such as the involvement of novel expressions or concepts, the use of unique and distinctive ideas or styles and the appeal arising from a striking visual appearance. A target audience’s attention can be automatically captured and attracted by these aspects of creative advertisements, making it easier for them to enter long-term memory. In addition, creative advertisements usually encompass a variety of rhetorical devices, including visual metaphors, exaggeration and metonymy, which make them more difficult to comprehend and may even mean that the audience experiences mental impasse (Baack et al., 2008). To understand these advertisements, people must expend more effort

and time processing them; this deeper processing and the time that it takes to elaborate and encode the information can potentially give rise to better memory for such advertisements.

Moreover, as mentioned above, creative advertisements could excite the audience's curiosity and interest and thus lead to pleasure and other positive emotions, which can consolidate the memory of these advertisements via emotion-related or multimodal encoding, rather than semantic coding only. Furthermore, creative advertising could, at least some of the time, satisfy an individual's need for uniqueness and creative self-expression, thereby motivating them to memorize the advertisement. Cumulative evidence has shown that target audiences exhibit more diverse or various affective fluctuations during the process of viewing creative advertisements. For instance, when people are unable to understand creative advertising they experience impasse, leading to negative emotions such as anxiety, disappointment and frustration (Chermahini & Hommel, 2010; Shen et al., 2017). When they then suddenly comprehended a difficult-to-understand advertisement they may experience positive emotions such as joy, surprise and happiness (e.g., Shen et al., 2016). This succession of emotions of different valences potentially helps the unconscious consolidation of a representation of the creative advertisement in the memory system (e.g., Smith, Chen, & Yang, 2008).

In sum, and consistent with previous research (e.g., Baack et al., 2008), creative advertisements benefit from better retention than standard advertisements. This study combined recognition measures (which reflect simultaneous conscious and unconscious processing) and recall measures (which are heavily reliant on conscious processing) to provide a more comprehensive picture of the memory effects of creativity in advertising. This research has demonstrated the advantages of creative advertising over standard advertising and provided

rigorous, multimethod evidence for the memory advantage of creative advertising.

4.3 Metamemory Characteristics of Creative Advertising

A third key result from the present research is that the metamemories that arise in relation to creative advertisements are better than those that arise in relation to standard advertisements. Examining the metamemory characteristics of creative advertising can effectively reflect the pattern of advertising memory (see Stretch & Wixted, 1998). Creative advertising appears to be associated with better metamemory because it is more attractive, more likely to elicit emotion and more attention-grabbing, which are all qualities that prompt an audience to invest more cognitive resources in processing, thereby leading to a more enduring memory trace. Because standard advertisements are less novel and only result in a weak memory trace, people have less confidence in their judgments of whether or not they have seen them before (Mitchum & Kelley, 2010).

Moreover, as we have demonstrated, creative advertisements are more likely to evoke insight-based responses. Previous studies have implied that the unique metacognitive characteristics of insight solutions should increase abruptly and reach a peak level of metacognitive monitoring at the stage of solution emergence (e.g., Metcalfe, 1986). The RCJs are not only retrospective but also primarily derived from the decision as to whether the advert has previously been seen or not. In this respect, better metacognitive (i.e., metamemory) performance for creative advertisements may be due to the more enduring memory trace of creative advertisements that arises at the moment of insight.

4.4 Limitations and Future Directions

The present research has several limitations that should be noted. First, the study took place in a laboratory-based setting and used university students as participants, without collecting

data from real-world advertising situations that involved real customers (notwithstanding the fact that university students are sometimes genuine customers). Second, the findings were primarily drawn from behavioral performance relating to memory (including metamemory) effectiveness as opposed to market performance. Whether there is any association between insight in advertising and actual market performance is an unsolved issue that requires more studies in the future. Third, the present results (see also the Supplementary Materials) provide behavioral data on the equivalence between two types of "insight" (i.e., when people transition from being "puzzled" to "understanding" and when they transition from an "incorrect inference" to "understanding"). Future research is needed to validate and extend these behavioral observations at the neurophysiological level (e.g., through neuroimaging measures). In business practice, advertisers can actively provide the audience with analytical clues regarding an advertising idea, which would help the audience to understand better the idea and promote their insight experiences towards the advertisement, and then trigger consumer delight or surprise, improving advertising effectiveness.

5 Conclusion

Overall, our results suggest that creative advertisements are capable of inducing an insight experience. Moreover, memory and metamemory for creative advertisements is superior than for standard advertisements. Advertisements that prompt a moment of insight are remembered better than those that do not, indicating that the occurrence of insight plays an important role in the memorability of advertisements and in metacognitive monitoring.

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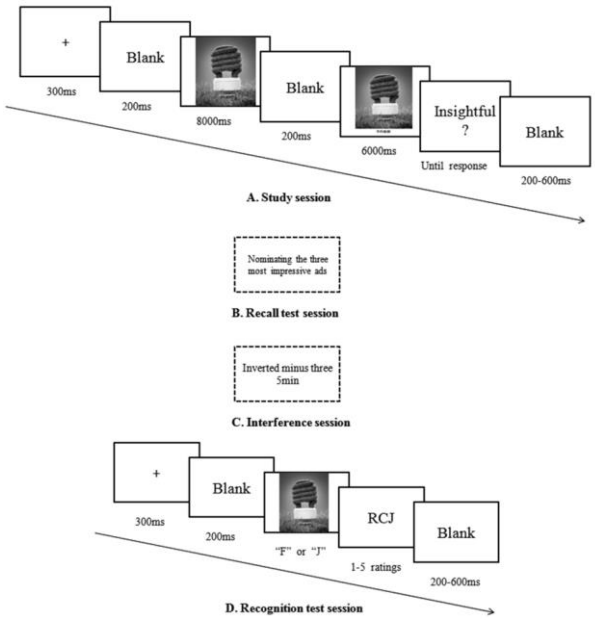

Figure 1 An illustration of one trial from the entire memory experiment

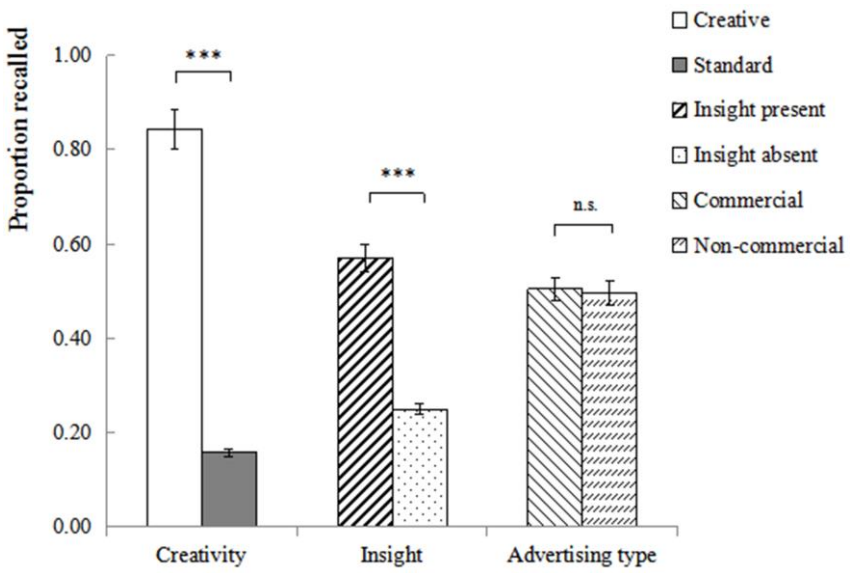

Figure 2 The proportion of advertisements of different types that were nominated as being in the top three preferred advertisements in the recall test

Table 1 Descriptive results for recognition accuracy and RCJ（*M*±*SD*）as a function of advertising creativity (creative vs. standard), insight (present vs. absent), advertisement type (commercial vs. non-commercial) and test time (immediate vs. delayed)

			Immediate(5min)		Delayed(3days)	
			Accuracy	RCJ	Accuracy	RCJ
Creative	Insight present	Commercial	0.95±0.11	4.93±0.20	0.77±0.27	4.74±0.52
		Non-commercial	0.98±0.07	4.96±0.14	0.76±0.27	4.73±0.38
	Insight absent	Commercial	0.84±0.09	4.88±0.18	0.70±0.15	4.82±0.26
		Non-commercial	0.97±0.04	4.90±0.15	0.79±0.12	4.72±0.40
Standard	Insight present	Commercial	0.90±0.07	4.84±0.21	0.79±0.01	4.57±0.33
		Non-commercial	0.83±0.09	4.81±0.22	0.77±0.11	4.47±0.46
	Insight absent	Commercial	0.95±0.11	4.82±0.40	0.79±0.20	4.65±0.41
		Non-commercial	0.83±0.28	4.79±0.52	0.54±0.39	4.65±0.52

Table 2 Results from a mixed-design ANOVA of the recognition accuracy data

Source	*MSE*	*F*	η_p^2
Test time	0.06	62.36***	0.49
Creativity	0.02	14.47***	0.18
Insight	0.03	8.21**	0.11
Advertising type	0.03	3.50	0.05
Creativity × Test time	0.02	0.95	0.01
Insight × Test time	0.03	3.24	0.05
Advertising type × Test time	0.03	1.88	0.03
Creativity × Insight	0.03	0.02	0.00
Creativity × Advertising type	0.03	34.21***	0.35
Insight × Advertising type	0.03	0.33	0.01
Creativity × Insight × Test time	0.03	10.06**	0.13
Creativity × Advertising type × Test time	0.03	< 0.01	< 0.01
Insight × Advertising type × Test time	0.03	2.54	0.04
Creativity × Insight × Advertising type	0.03	14.00***	0.18
Creativity × Insight × Advertising type × Test time	0.03	1.65	0.03

Note：*p < .05, **p < .01, ***p < .001, similarly hereinafter.

Table 3 Descriptive data showing true and false responses for new and old advertising images during the recognition session expressed as a percentage（*M*±*SD*) of the associated advertising images at study having induced an insight experience [i.e., insight present/(insight present + insight absent)]. Data are presented for creative versus standard advertisements as a function of test time (immediate vs. delayed). Please refer to the text for further details of the scoring method.

			Immediate	Delayed
Creative	New	False	86.23±25.54	82.42±14.31
		True	80.97±10.96	82.90±13.69
	Old	False	67.26±25.34	58.60±24.33
		True	73.72±14.56	75.10±16.13
Standard	New	False	14.64±20.00	24.45±19.31
		True	18.22±11.41	14.41±9.39
	Old	False	3.64±10.76	9.14±20.28
		True	13.23±7.90	15.12±9.26

Table 4 Results from a mixed design ANOVA of the insight induction data relating to responses in the recognition session

Source	*MSE*	*F*	η_p^2
Test time	0.06	0.08	0.00
Creativity	0.03	2027.96***	0.96
Stimulus type	0.02	101.23***	0.57
Response type	0.02	8.53**	0.10
Creativity × Test time	0.03	4.22*	0.05
Stimulus type × Test time	0.02	0.21	0.00
Response type × Test time	0.02	0.02	0.00
Creativity × Stimulus type	0.02	8.52**	0.10
Creativity × Response type	0.02	1.00	0.01
Stimulus type × Response type	0.03	20.25***	0.21
Creativity × Stimulus type × Test time	0.02	0.53	0.01
Creativity × Response type × Test time	0.02	13.24***	0.15
Stimulus × Response type × Test time	0.03	1.68	0.02
Creativity × Stimulus type × Response type	0.03	0.32	0.00
Creativity × Stimulus type × Response type × Test time	0.03	0.32	0.00

Note：*p < .05, **p < .01, ***p < .001, similarly hereinafter.