THE INFLUENCE OF COGNITIVE AND AFFECTIVE PRIMING ON BANNER AD ATTENTION AND EFFECT

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Abstract: The purpose of this study is to investigate the factor of web context in directing consumers’ attention to peripheral banner advertising and explore the moderate effect of ad attention on attitudes. Cognitive and affective priming activated by web contents are discussed in the study. Cognitive priming is manipulated by web contents being congruent with ad contents, and affective priming is manipulated by positive and negative affect aroused by web contents. Advertising attention and effects are measured as dependent variables; advertising attention is measured by the eye-tracking (1000 Hz EyeLink) which is used for recording respondents’ fixations; and, advertising effects including recall and attitudes are measured by questionnaires. A laboratory experiment is conducted and a total of 62 subjects are recruited in this study. This study has contrary results showing that cognitive priming has no significant impact on advertising attention and attitudes. Similarly, affective priming has no positive relationship with advertising attention, while positive affect has better advertising attitudes than negative affect does. Finally, the relationship between affective priming and advertising attitudes is moderated by ad attention. Specifically, with low advertising attention, consumers’ ad attitudes are influenced by consumers’ affect; however, with high advertising attention, this does not happen.

Keywords - Banner advertising, cognitive priming, affective priming, web context, ad attention, ad effects, eye-tracking.

I. INTRODUCTION

With the advance on the Internet technology, advertising media have extended from traditional media (such as television, newspaper, magazine) to online media. In 1994, the U.S. website “Hot Wired” published its private brand banner on Hot Wired and made the Hot Wired website become the pioneer of Internet advertising. Internet advertising grew since 1994. According to eMarketer’s latest research, the cost of Internet advertising for the first time exceeded that of traditional media in 2012 (Heine, 2012). The U.S. Internet advertising agency spent 39.5 billion dollars in 2012; compared with 2011, the cost increased 23.3%. In contrast, traditional advertising decreased from 36 to 33.8 billion dollars. From above surveys, it is understood that the Internet advertising market size becomes bigger, and advertisers pay more attention to the advertising market. Moreover, it turns out to be one of the important advertising media in addition to traditional media.

Although the Internet advertising market constantly grows, much research pointed out the inefficiency of Internet advertising. In the environment filled with lots of information, it was difficult to catch consumer attention (Pieters, 2008). Similarly, the past studies indicated that consumers were advertising avoidance (Drezé & Hussherr, 2003; Hervet, Guérard, Tremblay, & Chtourou, 2011; J. Lee & Ahn, 2012). Banners do not have high Click-through rate (CTR) which is roughly between 0.1% to 0.2% (Wasserman, 2011). Thus, the purpose of banners does not attract Internet users to click; rather, it tries to increase consumers’ brand perception and advertising memory (Goodrich, 2011).

Due to the significance and popularity of banner advertising, a lot of research studied its advertising effects in practical and academic fields. In the research of traditional advertising, advertising contexts (i.e. TV programs, newspaper, magazines) being an important factor in advertising effectiveness was proposed. A number of studies suggested that advertising contexts could influence the audience’s perception of the advertising and the effectiveness (Pocheptsova & Novemsky, 2010). In line with research in traditional advertisement, a lot of studies showed that web contexts were a critical factor for banner advertising effects (Goodrich, 2011; Hsieh & Chen, 2011; Hsieh, Chen, & Ma, 2012; J. G. Lee & Thorson, 2009). Scholars found that type of information in website demonstrated significant impact on consumer attention to peripheral advertisement by tracking individual information processing. For example, studies by Goodrich (2011) and Hsieh & Chen (2011) discussed how web information (text vs. pictures) influenced advertising effects, and showed that the users paid less attention to peripheral advertising in text-based webpage than picture-based webpage. In addition, types of websites also affected consumer attention on peripheral advertising. For instance, peripheral advertising resulted in lower advertising effects when consumers were surfing cognitive website than emotional website (J. G. Lee & Thorson, 2009). If web contents had more changes, such as text-picture mixed webpage, it could increase Internet users’ attention on advertisements (Hsieh et al., 2012).
It is obvious that advertising contexts may trigger and direct different information processing. Although many studies concerning Internet advertising examined the effect of ad context on ad effectiveness, relatively little attention was given to the effect of cognitive and affective priming, triggered by the web context, on consumers’ information processing and ad effectiveness. Therefore, the study examines the attention and effectiveness of banner advertising when web content activates cognitive and affective priming. In addition, the relationship between web contexts and advertising attitudes moderated by ad attention is explored in the study.

II. LITERATURE REVIEW AND HYPOTHESIS

2.2. Advertising context and advertising effectiveness

2.2.1. Cognitive priming and advertising attention

There is obvious evidence that contexts play as a critical factor in information processing and advertising effectiveness based on previous studies concerning traditional advertisement. The success of the advertisement is determined by the consumers’ perceived relevance of the message to their motivations. In the Internet marketing, literature review showed that the congruency between banner subjects and web contents influenced the way ad banners were watching and remembered. Congruity referred to the relationship between the nature of the content of an ad and its surrounding contexts, and to the association that the user could produce between them. That is, congruity generated a comfortable situation where the individual found expected and repeated things according to a mental schema he or she already had in mind, thus producing more ad attention and positive attitudes. The study by Rieger et al. (2014) indicated that complete context congruency including both visual and textual elements led to higher visual awareness, better retention, and better attitudes toward the advertisement. In addition, Porta et al. (2013) also showed congruity matters for the way banners being looked at, and increased the attention of peripheral ad. The idea of congruency between web contents and ad could be thought as cognitive priming which activates persons to pay more attention to information fitting with their category schemas. Therefore, congruence is treated as a predictor of consumer attention to the stimulus. Peripheral ad will be paid more attention when consumers are activated certain attributes of product in the ad-congruency context.

H1: Consumers have more attention to periphery banner advertisements when cognitive priming is activated by web contexts.

2.2.2. Cognitive priming and advertising attitude

Several studies demonstrated the effects of congruent information on attitudes in the field of Internet marketing. Consumers had a tendency to produce positive attitudes and emotions when the ad content was consistent with its surrounding contents. The argument was proved by Jeong & King (2010). They requested the participants to evaluate banners after they reviewed a website in which a contextually relevant banner and a contextually irrelevant banner were placed. Results suggested that a contextually relevant banner induced more favorable evaluation and a greater purchase intention toward advertised products than a contextually irrelevant counterpart. Further, Newman et al., (2004) focused on the attitudinal effects of adding a banner ad to a Web site and found that the ad should be congruent with the content of the site; if not, the attitudes toward the Web site would be harmed.

The similar concept, called cognitive priming, was provided by Yi (1990) who indicated that when the advertising context provided exposure to a certain attribute (e.g. when a magazine article mentioned the attribute), this attribute was likely to become accessible. Subsequently, the attribute was likely to be used in processing ad information. For example, when people saw a car advertisement with message “big size”, they might infer that the car would be comfortable. The interpretation was given depending on which of the related concept being the most easily accessible at the time. The interpretation of information depended on the particular knowledge structures and accessibility of certain concepts. Active or accessible concepts served to direct attention to selective aspects of information and were likely to be used in subsequent interpretations. Based on above findings, it is believed that those who are consciously aware of a congruent advertisement (as compared with an incongruent ad) will more readily assimilate the information into existing activated schemas and will have more favorable attitudes toward the ad. Therefore, it is argued that the cognitive impact of the advertising context would be induced when the ad attribute is activated by the context.

H2: Consumers have positive attitudes toward periphery banner advertisements when cognitive priming is activated by web contexts.

2.2.3. Affective priming and advertising attention

Most research suggested that individuals with positive affect demonstrated divergent thinking, fluid ideation, and flexible categorization, made unusual associations, and performed well on insight problems, unusual word associations, and heuristic problem solving tasks (Isen, Daubman, & Nowicki, 1987; Kaufmann, 2003). Positive affect led to the expansion of people’s attention (Isen, Johnson, Mertz, & Robinson, 1985), broadening individual thought and action repertoires (Fredrickson & Losada, 2005). The study by Isen and Reeve (2005) indicated that people in the positive affect facilitated intrinsic motivation,
an enjoyment and performance of enjoyable tasks, but not at the cost of responsible work behaviors on an uninteresting task. Furthermore, Blay et al. (2011) tested the joint influence of risk and affect on information search efficiency. Their findings showed that information search was less efficient when risks were high. Besides, information search strategies for positive affect and negative affect were different. Negative affect was associated with more efficient search when the task was with high risks, while positive affect had the relationship with less efficient search when risks were low. Some researchers proposed that negative affect suppressed information processing, causing people to adopt simpler strategies (Mano, 1992, 1994) or focus on a single detail (Gasper & Clore, 2002). Luce et al. (1997) revealed that negative affect caused people to utilize fewer attributes or only attribute-based information for making decisions.

In line with literatures mentioned above, positive affect expands people’s thinking and enriches the variety and flexibility when processing information, directs their attention to different information, and fosters flexible thinking. Therefore, it is inferred that when a webpage triggers consumers’ positive mood, they may pay more attention to information irrelevant to their current tasks and have better attention to periphery banner advertisings. However, when it results in negative affect, the extension of attention is impaired and less attention is paid to periphery banner advertisings. The following is the first hypothesis of the present study.

H3 : When consumers are with positive affect which is aroused by the webpage they are viewing, they have better advertising attention.

2.2.4 Affective priming and advertising attitude
Affect influences people’s judgments; for example, people tend to make positive interpretations when they are in a positive affect (Mittal & Ross, 1998). Previous studies explained this with mood congruence effects, suggesting that positive mood got decision makers to think positively about future outcomes (Au, Chan, Wang, & Vertinsky, 2003) while negative mood made them think the opposite way (Seo, Goldfarb, & Barrett, 2010). Affect states are related to the way in which some advertising works and researchers found that they had important effects on persuasion and evaluation. The study by Gardner & Wilhelm (1987) explored the influences of context-induced affect on advertising effects, and their findings indicated that viewers exposed to an advertisement in a positive context-induced affect would have more favorable evaluations of the advertisement than those exposed to the advertising in a negative context-induced affect. Individual affect states also have important impact on advertising attitudes (Aylesworth & MacKenzie, 1998; Batra & Stayman, 1990; Pocheptsova & Novemsky, 2010).

Yoo&MacInnis(2005) manipulated the form of their advertisings (emotional and informational) and found that emotional advertisings aroused positive affect, increasing the trust of the advertisings and affecting the advertising attitudes and brand attitudes. When advertisings were presented in informational form, credibility and positive affect were increased and negative affect was reduced. Additionally, Yoo&Pena (2011) explored the benefits of advertisings embedded in computer games, and their results showed that consumer memory and recognition to advertising brands were lower when being presented in violent games, but higher when being presented in non-violent games. Their study supported the limitation of attention and cognitive resources, and further explained how violent media weakened the effect of advertisings. Therefore, the present research proposes a hypothesis that consumer attitudes toward peripheral banner advertisings on a webpage is better when they are in positive mood.

H4: When consumers are with positive affect which is aroused by the webpage they are viewing, they have better advertising attitude.

2.3 Advertising attention and effects
Advertising effects in this study include advertising attitudes and recall. Most studies indicated that advertising attention had positive association with advertising recall (Goodrich, 2011; J. Lee & Ahn, 2012; Pieters, Warlop, & Wedel, 2002). Studies applying eye-tracking to trace information process showed that attention increased information available to memory, which improved brand recall (Pieters et al., 2002), and that attention was associated with recall (Scheier, 2003). Therefore, the argument is provided that advertising attention is significantly related to advertising recall.

H5 : Consumers’ advertising attention has positive impact on advertising recall.

The Elaboration Likelihood Model (ELM), developed by Petty and Cacioppo(Petty & Cacioppo, 1986), is a dual process theory describing how attitudes are formed and changed. The model defines two processing routes of central and peripheral. The "central route" represents the processes involved when elaboration likelihood is high, and the "peripheral route" typifies the processes operative when elaboration likelihood is low. As Chaiken(1980) noted, the central route encompassed her systematic view of persuasion whereas the peripheral route encompassed her heuristic view of persuasion. Under the central route, greater issue involvement would result in greater attention to message-relevant arguments and potentially, depending on the quality of those arguments, last attitude change. Alternatively, the peripheral route does not involve the diligent consideration of the message arguments. Rather, attitudes are simply based on peripheral cues that are
associated with the message. Attitudes formed under high elaboration (the central route) are stronger than those formed under low elaboration, making this level of persuasion stable and less susceptible to counter-persuasion. Base on ELM, a hypothesis is provided. Under low advertising attention, consumers adopt peripheral route for advertising message. Consumers consider little advertising message and their advertising attitudes are influenced by the surrounding contexts easily. On the contrary, under high advertising attention, consumers adopt central route. They have more involvement in the advertising message and have careful and thoughtful consideration of advertising arguments. Therefore, the advertising attitudes are influenced by the advertising message and seldom influenced by surrounding contexts. There is no relationship between advertising attitudes and surrounding context priming when consumers pay more attention to the banner advertisements.

H6: There is a positive relationship between advertising attitudes and surrounding context priming under low advertising attention, but there is no relationship between advertising attitudes and surrounding context priming under high advertising attention.

III. RESEARCH METHODOLOGY

The experimental design adopts a factorial design with 2 (cognitive priming vs. no-cognitive priming) x 2 (positive vs. negative affective priming) factors in the advertisement effects, including advertising attention, attitudes, and recall. The relationship between cognitive priming and attention, as well as affective priming and attention are explored, and advertising attention is considered as the moderator to the influence of web context on advertisement attitudes.

3.1. Process

A total of 62 college students from a university with the age ranging 18-22 years are recruited as the subjects. The experiments are conducted in a bright, quiet laboratory. The test website is shown on a 17-inch LCD screen. The calibration and a subsequent validation are treated. To keep the participants from knowing the intention of the experiment, the participants are told that the browsing behavior of online news website would be investigated. 4 news webpages are randomly presented to each subject as the stimuli, and each page is limited to a maximum of five minutes to browse. At the same time, the eye tracker starts to record the subjects’ eye movements. After finishing four trials, the participants are provided with a questionnaire about their background and advertising attitudes and recall scale.

3.2. Measurement

Advertising attention, attitudes and recall are measured as advertising effects in the study. Attention is measured in terms of numbers of eye fixation which is captured by using EyeLink II with a sampling rate of 1000Hz for tracking and recording the subjects’ eye movements. Recall measurement is applied to evaluate a subject’s memory of the banner advertisements, and is considered to be a very sensitive method for memory evaluation. Advertising recall is measured by aided recall, which is referred to the measurement used by Lee & Thorson (2009). Referred to the study of Zhang and Zinkhan (2006), advertising attitudes are measured using three attitude items on a 5-point Likert scale (5 highest and 1 lowest).

IV. RESULT

The eye movement data from each participant are inspected using a custom-made program to determine whether or not the data are invalid due to incorrect calibration (i.e., the fixations are out of screen positions). A total of 62 college students are recruited in the study. Six participants are excluded due to incorrect calibration and fifty-six participants are valid. Cash reward is given for the participation.

4.1. Cognitive priming and advertising attention

T-test is applied to test hypotheses 1 and 2. The results show that there is no significant difference in advertising attention (t=0.74; p=0.46>0.05) and advertising attitudes (t=1.72; p=0.09>0.05) between ad-context congruency and incongruency, H1 and H2 are not supported. Consumers pay the attention to advertisement no matter in ad-congruency contexts or ad-incongruency contexts (M=7.84 vs. M=6.98). Similarly, consumer attitudes toward the ad is not better in ad-congruency contexts than those in ad-incongruency contexts (M=1.87 vs. M=1.55).

4.2. Affective priming and advertising attention

T-test reveals that there is no significant difference in the advertising attention between consumers in positive and negative affect (t=1.28; p=0.20>0.1), H3 is not supported. Consumers with positive affect have almost the same advertising attention with those with negative affect (M=4.58 vs. M=3.65). However, T-test shows that consumers' affect states elicited by the website context have a significant impact on their advertising attitudes (t=3.14; p=0.002<0.05), supporting H4. Consumers with positive affect have better advertising attitudes than those with negative affect (M=1.79 vs. M=1.13).

4.3. Advertising attention and advertising recall

Linear regression is conducted to test the relationship between advertising attention and advertising recall. The result reveals that attention is positively related to recall (F=56.448, R²=0.199; p=0.01, B=0.45), supporting H5. Higher attention to the advertising,
therefore, is associated with higher recall, consistent with previous studies (Goodrich, 2011; J. Lee & Ahn, 2012; Pieters et al., 2002).

4.4. Attention and attitude

Ad attitude is influenced by affect priming, not by cognitive priming, based on the verification of hypotheses H2 and H4. Therefore, the moderating effect of attention is investigated to the relationship between affective priming and ad attitudes. Participants are divided into high advertising attention and low advertising attention by median 2 in order to investigate whether the relationship between consumers’ affect and advertising attitudes is moderated by advertisement attention. Attention scores higher than 2 are categorized into high advertising attention. On the other hand, scores lower than 2 are categorized into low advertising attention. T-test is applied to test the difference of advertising attitudes between positive affect and negative affect under high and low advertising attention.

Under high attention, there is no difference in the advertising attitudes between consumers in positive and negative affect (M=2.37 vs. M=1.89; t=1.60; p=0.11 >0.1). The result shows that consumers’ affect facilitated by webpage has no impact on advertising attitudes under high advertising attention. However, under low attention, there is significant difference in the advertising attitudes between consumers in positive and negative affect (M=1.25 vs. M=0.70; t=2.11; p=0.03 <0.05). The result presents that consumers’ affect facilitated by webpage has positive association with advertising attitudes under low advertising attention.

V. DISCUSSION

The study investigates the possible influence of web context including cognitive and affective priming on the way that ad banners are watched and ad attitudes are changed. The findings of the study do not support the hypothesis that cognitive priming increases the likelihood of ad attention and attitudes, contrast with previous studies concerning ad-congruency. However, affective priming has influence on consumers’ ad attitudes but not on ad attention. Overall, ad attention is not easily influenced by web contexts, while web contexts have impact on ad attitudes.

Limited Capacity Theory was proposed by Lang (2000), which was based on Kahneman’s (1973) limited cognitive capacity and Ohman’s (1979) limited capacity attention model. Limited cognitive capacity indicated that humans had limited attention on information, and their cognitive load was finite. If much information appeared at the same time, individuals might not have enough cognitive resources, so they were not able to deal with those information. Banner advertisements and webpage are presented at the same screen. Therefore, the participants use more cognitive resources for the webpage and ignore periphery banner advertisements because of the limited cognitive capacity. Ad attitudes rather than attention are more easily influenced by web contexts. The study finds that web contents would elicit positive and negative different affect states which significantly affect advertising attitudes. Although the web content and peripheral banners are presented at the same time, the affect elicited by web contents has significant effects on ad attitudes. The results have been consistent with mood congruency hypothesis and associative network mode. According to those theories, the effect of positive affect may influence product evaluations. Positive affect increases the likelihood that positively valenced information will be retrieved, because this affectively congruent material has been activated, or primed, by the affective state. Similarly, negative affect is thought to enhance the recall of negatively valenced information. Therefore, positive attitudes induced by positive affect are transferred to form better attitudes toward ad. However, the empirical result shows that cognitive priming has no positive influence on ad attitudes although previous studies have supported the positive relationship. The reason may be that the influence of cognitive priming on ad attitudes happens in the situation that ad attributes are watched. However, congruency does not increase the probability of ad attention, and therefore ad attributes are ignored, producing ad attitudes not being changed. Additionally, there is a positive relationship between banner attention and recall; however, no direct relationship between attention and attitudes. Consistent with ELM, advertising attitude is shaped by advertising message when consumers have high ad attention, and however shaped by periphery contexts when consumers have low ad attention. Therefore, the design of banner should be given more efforts if advertisers want to improve brand recall. Besides, if advertisers want to promote advertising attitudes, they should not only consider advertising design but also the place where the advertising is put. The place in which ad is put should be paid more attention based on the phenomenon of banner blindness. More pleasant environment will produce better attitudes toward peripheral ad when ad gets little attention.

REFERENCES

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