

行政院國家科學委員會專題研究計畫 期末報告

情緒、網頁資訊型態與任務需求對廣告注意力導向之影響

計畫類別：個別型
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報告附件：出席國際會議研究心得報告及發表論文

公開資訊：本計畫涉及專利或其他智慧財產權，2年後可公開查詢

中華民國 102 年 10 月 31 日

中文摘要：由於網路使用者不斷增加，使得全球資訊網成為快速成長及人性化的廣告媒介。然而，近來的研究指出，廣告視盲（banner blindness）的現象大大地減弱了廣告業者運用視覺設計特徵（例如，亮度、顏色、大小、對比）增加橫幅廣告顯目性的效果。然研究者提到，比起廣告的視覺設計，有效的廣告注意力、網頁資訊的處理方式、及使用者的任務負荷對廣告的有效性更具影響力。因此，如何選擇適當的廣告情境，以吸引更多的消費者注意力顯得更為重要。

行銷研究指出，字詞所具有的不同情緒效價（emotional valence）扮演引起注意力的重要角色。然而，現有的研究尚未有系統地探討情緒字詞所引起的注意力效果，是否受到網頁資訊型態及使用者任務負荷之主要及交互效用的影響。因此，本研究之目的在探索當人們專注於主要任務時，廣告情緒、網頁資訊型態、及任務需求對廣告注意力導向的影響。本研究檢視不同的網頁資訊型態是否造成對週邊廣告可用資源的差異。並檢視在以文字為主與以圖片為主的網頁內容情境中，廣告裡出現的言辭情緒線索是否會在前注意階段（preattentively）被察覺，以及是否被以不同的方式處理。此外，我們操弄任務負荷量以探究其如何影響注意力資源策略（前注意力 vs. 注意力）。

研究結果對於前注意處理提出幾個重要的洞見。首先，實證結果指出前注意處理可以從非中央視野的文字刺激物獲取足夠的語義資訊、決定情緒字的內容。其次，我們延伸注意力干擾之研究，證實注意力干擾的趨力受到視野（visual field）的影響。當情緒字置於右視野（RVH, right visual field）時，正向情緒標題比負向情緒標題有更高的優先處理權。最後，比較以文字為主與以圖片為主的網頁，發現在以圖片為主的網頁中，正向情緒標題的再認記憶優於負向情緒標題；而以文字為主的網頁中，正負向情緒字的再認記憶則無差別。此可提供行銷人員對於廣告文案及配置的策略：在廣告充斥的環境中，在圖片為主的網頁中，廣告應使用正向情緒標題，而在文字為主的網頁中，正負向情緒標題皆可使用。

中文關鍵詞：情緒、資訊型態、任務需求、注意力、廣告

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and users' task load on the attention grabbing effect elicited by emotional words. As a result, the objective of the present study is to investigate when people focus on a primary task, whether ad emotionality, web information type, and task demand affect the orienting attentional responses in advertising.

In this study, we examined whether different web information types result in different resources available for peripheral advertisements. We also examined whether the verbal emotional cues in advertising are detected preattentively and processed differently under the text-based versus the picture-based web content condition. Furthermore, we manipulated task processing load to investigate its critical role in influencing the attentional resource strategy (i.e., attentive versus preattentive). Our findings contribute important insights into preattentive processing research. First, the empirical evidence suggests that preattentive processing can extract enough semantic information from nonfocal verbal stimuli to determine the emotional content of a nonfocal word. Second, we extend research on attentional interference by demonstrating that the driver of attentional interference effects may be impacted by the visual field. Specifically, positive emotional headlines placed on the RVF have higher processing priority than negative emotional words. Finally, the comparison between text-based and picture-based webpage indicates that the recognition of positive emotional headlines outperform the recognition of negative ones in the picture-based webpage, whereas no valence difference in the text-based webpage. This provides the strategy of ad copy and placement for marketers. To reach consumers in the midst of ad clutter, positive emotional headlines should be used in the picture-based webpage whereas both positive and negative emotional headlines could be used in the text-based webpage.

英文關鍵詞： emotionality, information type, task demand,

attention, advertising

行政院國家科學委員會補助專題研究計畫

期中進度報告
期末報告

情緒、網頁資訊型態與任務需求對廣告注意力導向之影響

**The effects of emotionality, web information type, and task demand
on orienting attention responses in advertising**

計畫類別：個別型計畫 整合型計畫

計畫編號：NSC 101-2410-H-343-003-

執行期間：101年8月1日至102年7月31日

執行機構及系所：南華大學 資訊管理學系

計畫主持人：吳梅君 助理教授

計畫參與人員：吳俊彥、林于斌、李文峰

本計畫除繳交成果報告外，另含下列出國報告，共 1 份：

移地研究心得報告

出席國際學術會議心得報告

國際合作研究計畫國外研究報告

處理方式：除列管計畫及下列情形者外，得立即公開查詢

涉及專利或其他智慧財產權，一年二年後可公開查詢

中 華 民 國 102 年 10 月 30 日

情緒、網頁資訊型態與任務需求對廣告注意力導向之影響

摘要

由於網路使用者不斷增加，使得全球資訊網成為快速成長及人性化的廣告媒介。然而，近來的研究指出，廣告視盲（banner blindness）的現象大大地減弱了廣告業者運用視覺設計特徵（例如，亮度、顏色、大小、對比）增加橫幅廣告顯目性的效果。然研究者提到，比起廣告的視覺設計，有效的廣告注意力、網頁資訊的處理方式、及使用者的任務負荷對廣告的有效性更具影響力。因此，如何選擇適當的廣告情境，以吸引更多的消費者注意力顯得更為重要。

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本研究檢視不同的網頁資訊型態是否造成對週邊廣告可用資源的差異。並檢視在以文字為主與以圖片為主的網頁內容情境中，廣告裡出現的言辭情緒線索是否會在前注意階段（preattentively）被察覺，以及是否被以不同的方式處理。此外，我們操弄任務負荷量以探究其如何影響注意力資源策略（前注意力 vs. 注意力）。

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關鍵字

情緒、資訊型態、任務需求、注意力、廣告

The effects of emotionality, web information type, and task demand on orienting attention responses in advertising

ABSTRACT

The increasing use of the World Wide Web has promised a fast-growing and user-friendly medium for advertising. However, recent studies have reported that the phenomenon of “banner blindness” has greatly weakened advertisers’ effort on highlighting the influence of those visual design features (e.g., brightness, color, size, contrast) on banner advertising. As researchers point out, the attention available for advertisements, method applied to process the web information, and user’s task load can have more influence on ad effectiveness than the visual design of advertisements. Consequently, how to select a proper context for advertising that can elicit more attention from consumers has become more important.

Several marketing studies have reported that words with different emotional valences play a critical role in capturing attention. However, existing research has yet to systematically investigate the main and interplay effects of web information type and users’ task load on the attention grabbing effect elicited by emotional words. As a result, the objective of the present study is to investigate when people focus on a primary task, whether ad emotionality, web information type, and task demand affect the orienting attentional responses in advertising.

In this study, we examined whether different web information types result in different resources available for peripheral advertisements. We also examined whether the verbal emotional cues in advertising are detected preattentively and processed differently under the text-based versus the picture-based web content condition. Furthermore, we manipulated task processing load to investigate its critical role in influencing the attentional resource strategy (i.e., attentive versus preattentive).

Our findings contribute important insights into preattentive processing research. First, the empirical evidence suggests that preattentive processing can extract enough semantic information from nonfocal verbal stimuli to determine the emotional content of a nonfocal word. Second, we extend research on attentional interference by demonstrating that the driver of attentional interference effects may be impacted by the visual field. Specifically, positive emotional headlines placed on the RVF have higher processing priority than negative emotional words. Finally, the comparison between text-based and picture-based webpage indicates that the recognition of positive emotional headlines outperform the recognition of negative ones in the picture-based webpage, whereas no valence difference in the text-based webpage. This provides the strategy of ad copy and placement for marketers. To reach consumers in the midst of ad clutter, positive emotional headlines should be used in the picture-based webpage whereas both positive and negative emotional headlines could be used in the text-based webpage.

KEYWORDS

emotionality, information type, task demand, attention, advertising

1. Introduction

Internet users are over 2 billion and this number has increased 400% between 2000 and 2010 (Internet World Stats 2011). The increasing use of the World Wide Web has promised a fast-growing and user-friendly medium for advertising. Investment in online advertising is growing and is expected to overcome traditional media (ZenithOptimedia 2011). Thus, having the attention of online consumers is especially important considering the number of users and the potential reach of messages. However, recent studies have reported that users avoid looking at areas they consider to display advertising (Benway 1998; Drèze & Hussherr 2003; Hervet et al. 2011). The phenomenon of “banner blindness” has greatly weakened advertisers’ effort on highlighting the influence of those visual design features (e.g., brightness, color, size, contrast) on banner advertising.

The inconsistency between the decreasing attention on advertising (Hervet et al. 2011) and the growing investment made in online advertising (ZenithOptimedia 2011) deserves further research. As Hsieh & Chen (2011) point out, the attention available for advertisements, method applied to process the web information, and user’s mental workload can have more influence on ad effectiveness than the visual design of advertisements. Therefore, how to select a proper context for advertising that can elicit more attention from consumers has become more important.

Several marketing studies have reported that words with varied emotional valences play a critical role in capturing attention (Nielsen & Shapiro 2009; Shapiro 1999). However, existing research has yet to systematically investigate the effects of users’ task demand on the attention grabbing effect elicited by emotional words. As a result, in this study we investigate when people focus on a primary task, whether ad emotion, task demand and web information type influence the orienting attentional responses in advertising.

The objective of the present study was to investigate the influences of ad emotionality, task demand, and web information type on attention responses in advertising when people focus on a primary task. Specifically, we manipulated task processing load to investigate its critical role in influencing the resource strategy (i.e., attentive versus preattentive). Furthermore, we examined whether different web information types result in different resources available for peripheral advertisements. We also investigated whether the verbal emotional cues in advertising are detected preattentively and processed differently under the text-based versus the picture-based web content condition.

2. Theoretical Background and Research Hypotheses

2.1. Hemispheric Asymmetry for Emotional Processing

Before shifting attention to a specific location, people engage in a preattentive processing of the environment automatically. The visual field in which a stimulus appears can constrain preattentive processing to one hemisphere of the brain and consequently influence the formation of a mental representation of the stimulus (Janiszewski 1993). The lateralization of brain functions for emotional processing varies in their ability to encode and store the mental representation of emotional content. More importantly, the differential suitability of the left and right hemisphere for forming a mental representation of a stimulus during

preattentive processing implicates one potential benefit of the incidental processing of advertisements.

Different research findings for the lateralization of brain functions for emotion originates from whether it is the experience, expression, or perceptual processing of emotion that is examined (Holtgraves & Felton 2011). According to the valence hypothesis, hemispheric asymmetry for emotion depends on valence. Specifically, valence hypothesis declares that the right prefrontal cortex is associated with negative emotion and the left prefrontal cortex with positive emotion (Davidson 2003; Davidson et al. 2000). For example, Davidson et al. (1990) found that inducing negative mood is associated with greater activity in the right prefrontal region, whereas inducing positive mood is associated with greater activity in the left prefrontal region. In addition, EEG and fMRI show greater activation in the left hemisphere (LH) to positive images (Canli et al. 1998; Wheeler et al. 1993) and fMRI shows greater activation in the right hemisphere (RH) to negative images (Canli et al. 1998). While valence hypothesis proposes a RH advantage for the perception of negative stimuli and an LH advantage for the perception of positive stimuli, there appear to be differences for the perception of verbal and nonverbal emotional stimuli (Bayer et al. 2011; Holtgraves & Felton 2011; Hughes & Rutherford 2013; Mneimne et al. 2010).

Relative to nonverbal (e.g., facial expressions, and pictures) stimuli, prior research on the perception of emotion has paid relatively little attention on the processing of verbal stimuli. Further, the research that has been conducted has yielded inconsistent results in the area of emotion lateralization. Several researchers have examined memory for words varying in emotional valence presented to the left and right hemispheres. Consistent with the valence hypothesis, Ali and Cimino (1997) found enhanced memory for positive emotion words presented to the LH relative to the RH, with the reverse occurring for negative emotion words. Recently, Holtgraves and Felton (2011) examined recognition speed with a lexical decision task for emotion words presented to the right and left hemispheres. Positive words were recognized faster when presented to the LH than presented to the RH, whereas this pattern did not occur for negative words. In contrast, Nagae and Moscovitch (2002) found enhanced memory for both positive and negative emotional words presented to the RH (see also Collins & Cooke 2005). Similarly, Atchley et al. (2007) found the RH to be particularly sensitive to valence when participants made affective judgments of words.

Attention capture by emotional stimuli is often proposed to be driven by negativity. The effect of positive emotion on attention has been described in far fewer studies than that for negative emotion. However, most negative stimuli used in studies to date are also highly arousing. Whether it is valence or arousal that accounts for the effect of emotion on attention is not clear (Fernandes et al. 2011). Hence, it is particularly important to equate arousal level of emotional words because negative stimuli are often rated as more arousing than positive or neutral stimuli (Garavan et al. 2001), and there may be different neural pathways for valence and arousal (Heller 1993; Kensinger & Corkin 2004). In a recent study, Nielsen et al. (2010) used a design that equated valence and arousal and found no attentional difference between positive and negative words when they were presented to the RH/LVF. In contrast to the valence hypothesis, their findings were in accordance with the concept that RH systems are generally biased toward the processing of all emotional stimuli (Mneimne et al. 2010).

In the present study, we examined the preattentive detection of emotion words in a cluttered online environment, in which participants focused their attention on the primary task. The emotion words were embedded in the headlines of nonfocal advertisements and presented to the RVF/LH. To investigate whether it

is valence or arousal that accounts for the effect of emotion, the emotion words were equated in terms of arousal. According to the hemispheric asymmetry for emotion processing and the prediction of valence hypothesis, we expected enhanced memory for positive emotion words than negative emotion words presented to the RVF.

H1: When advertisements irrelevant to the primary task appear on the RVF, headlines featuring positive words are more likely to be recognized than headlines featuring negative words.

2.2. Orienting Attention Responses

The presence of emotional distracter information can compete with other stimuli for attentional resources and cause interference with a primary task (Buodo et al. 2002; Fox et al. 2002). For example, using a Stroop (1935) color-naming task, Pratto and Oliver (1991) find that when presented with ego-threatening words, participants shift their attention from a primary task (i.e., naming the color of the word font) to an unrelated task (i.e., processing the meaning of the word). Due to a delayed disengagement from the emotional words (i.e., attention shift from the word “color” to word “meaning”) (Koster et al. 2004), the results show better memory for threatening target words. This type of interference effect is termed as “automatic vigilance”, owing to the threatening stimuli grabbing attention from the primary task.

Emotional, especially threat-related, information evoke automatic orienting responses to attract visual attentive processing (Williams et al. 1997). Evidence from electrophysiological recordings indicates that early visual components are impacted by the emotionally significant stimuli (Stolarova et al. 2006). Studies show enhanced detection for threat-relevant stimuli on visual search tasks (Eastwood et al. 2001; Fox et al. 2005). For example, attention is drawn faster to emotional than neutral items when these are the targets to be searched (Frischen et al. 2008). Öhman et al. (2001) demonstrate that participants detected threatening stimuli earlier than neutral stimuli. Further, Roskos-Ewoldsen et al. (1992) show that highly accessible attitudes serve an orienting function, automatically shifting attention away from the current fixation point to an area of the visual display that contains items with strong object-attitude associations.

Distinguishing attention grabbing versus attention holding is important so as to explore the attention shifts from cognitive processing of emotional information (Fox et al. 2001; Schimmack 2005). However, previous studies have differed in terms of the spatial relationship between target stimuli and distracters. In some studies, targets and distracters appear separately at fixation and in the periphery (Pessoa et al. 2002), separately and away from fixation (Vuilleumier et al. 2001), overlapping and at fixation (Anderson et al. 2003), or overlapping and in the periphery (Williams et al. 2005). The spatial location of competing stimuli is important because data suggest that spatially contiguous distracting features can generate greater interference (MacLeod 1991). To demonstrate orienting attention responses do occur when stimuli are presented outside the focal view, redesigning the task is necessary. Recent studies by Nielsen et al. (2010) and Ferreira et al. (2011) have shown that when the primary task requires focused attention, preattentive processing can extract enough semantic information from nonfocal stimuli and elicit orienting attention responses.

2.3. Arousing Stimuli and Orienting Attention Responses

It has been argued that the cognitive processing of emotional, especially threat-related, information has

potent effects on the orienting of attention. However, several studies indicate that valence per se is not the most important determining factor for attentional capture but that the arousal value of stimuli is associated with attentional capture (Schimmack 2005; Vogt et al. 2008).

The arousal theory literature suggests that arousal level is what modulates attentional focus, with highly arousing affect attention capture, regardless of valence. For example, Lang et al. (1993) have shown that participants chose to look at highly arousing images for longer than non-arousing images. Using a visual search task, Berggren et al. (2012) found no threat superiority effect (i.e., comparable performance for both positive and negative facial visual search). Similarly, studies have shown a reduced attentional blink when a second target, to be detected within a stream of rapidly presented images, was highly arousing positive and negative verbs (Keil & Ihssen 2004) or sexual/taboo words (Anderson 2005; Arnell et al. 2007). These findings indicate that highly arousing stimuli capture attention, regardless of their emotional valence (Vogt et al. 2008). In contrast, Fernandes et al. (2011) found that while highly-arousing negative emotional images may capture attention, low arousing positive picture can lead to attention capture. These findings suggest that other factors (e.g., approach motivation) may capture attention.

With regard to emotional word processing, findings with ERPs have shown that written words elicit emotion effects similar to pictures (Liu et al. 2010). Imaging studies using ERPs provide evidence for a rapid activation of emotional content during word processing, even if emotional content is not in the focus of attention (Schacht 2009; Scott et al. 2009; Siegle et al. 2010). It has been suggested that emotion effects might be arousal-driven as emotional processing of positive and negative stimuli elicited similar pupillary dilations (Bayer et al. 2011; Bradley et al. 2008). Bayer et al. (2011) found that high-arousing words were related to smaller pupil diameters than low-arousing words. Their findings revealed that the emotional content of a word resulted in cognitive facilitation. The facilitating effect of arousal was evident in faster response times to high-arousing words than to low-arousing words in the lexical decision task.

The findings of enhanced memory performance for high-arousing stimuli are well documented (Cahill 1998; Dolcos et al. 2004; Kensinger & Corkin 2004; Mickley Steinmetz & Kensinger 2009). Memory enhancement for written words might result from enhanced perceptual processing and attention capture, as has been shown for arousing stimuli (Keil & Ihssen 2004; Keil et al. 2006; Lang et al. 1998). In Vo and colleagues' (2008) study, participants performed a recognition memory task on negative, neutral, and positive words. During the study phase, (highly arousal) negative words were associated with smaller pupillary reactions than positive words, indicating that less effort was necessary for their encoding. In a subsequent recognition task, emotional words correctly classified as old evoked smaller pupillary dilations than correctly remembered neutral words. These findings indicate that emotional arousal facilitates processing both during encoding and retrieval (Bayer et al. 2011; for a review on emotional memory, see Hamann 2001).

In general, high arousal value of emotional content demand attentional preference and orient attention responses (Nielsen et al. 2010). Studies reported that words with distinct emotional cues play an important role in capturing users' eyes by the activation of basic cognitive process of memory and attention (Nielsen & Shapiro 2009). If high arousal words are well processed at a preattentive level, it implies that the common phenomenon of advertising avoidance on the internet could be reduced by the proper use of emotional stimuli (Ferreira et al. 2011). To summarize, we propose:

H2: When advertisements appear outside the area of focal attention, headlines featuring high arousal words are more likely to be recognized than headlines featuring low arousal words.

2.4. Processing Load on Emotion Processing

There are two resource strategies for processing environmental stimuli: attentive and preattentive (Janiszewski 1993). The attentive resource strategy applies when individuals voluntarily divert their attention away from the primary task and nonfocal stimuli are processed attentively. The preattentive resource strategy applies when the secondary stimulus is initially processed preattentively.

According to the attentive resource strategy, processing load of the primary task influences the mental resources available to attend and process nonfocal stimuli in the surroundings (Hsieh & Chen 2011; Janiszewski 1993; Sternberg & Mio 2008). Thus, increasing the resource demands of the primary task decreases the resources available for processing secondary stimuli and the recognition of secondary stimuli decreases. Studies that have used multiple levels of processing load on emotion processing during unattended conditions support the view that emotion processing is subject to the availability of attentional resources (Pessoa et al. 2002; Pessoa et al. 2005). For example, while negatively-valenced photos have been found to interfere with competing tasks, this interference was only observed for tasks that did not require significant attentional resources (Okon-Singer et al. 2007). Additionally, fMRI data also support that negative images are more demanding than positive images (Gerdes et al. 2010; Killgore & Yurgelun-Todd 2007). Thus, reduced emotional responding may arise because of innate limitations in perceptual and cognitive processing capacities (i.e., emotional stimuli might not be perceived because processing resources are unavailable). Converging evidence of the processing demand stems from studies suggesting that emotional stimuli are less well processed when working memory resources are limited (Erk et al. 2007; Van Dillen & Koole 2007).

In contrast, the preattentive resource strategy applies when the secondary stimuli are initially processed preattentively and the initial analysis causes attention shifts that result in superior memory for emotional content (Nielsen et al. 2010). According to “matching activation” (Janiszewski 1993), the increasing demands on the processing in one hemisphere of the brain (processing of the primary task) also increase the resources available for processing in the opposite hemisphere (preattentively processing of the distracters). For example, Janiszewski (1993) demonstrated that under time pressure condition (i.e., limited attention resources), increases in the processing load of the attended claims in the advertisements resulted in increases in the evaluation of the nonfocal brand names. The increased evaluation of the brand names, resulting from the preattentive processing of the verbal stimuli, can be attributed to the matching hemispheric activation. Similarly, Nielsen et al. (2010) found when users focused on text reading, high processing load of the primary task led to greater attention and better memory for nonfocal advertising featuring highly arousal stimuli. These findings are consistent with the matching activation: the more cognitive resources are activated in one hemisphere, the more preattentive processing occurs in the opposing hemisphere (Janiszewski 1993; Nielsen et al. 2010).

In this study, the primary task is to focus on processing the main content of online webpage while the advertisements are presented to the right of text (RVH/LH). While preattentive analysis of the peripheral environment would form a mental representation of significant information and cause attention shift, the memory trace of this analysis may be resource dependent. According to matching activation and hemispheric

asymmetry for emotional processing (positive words are better processed by LH than negative words), the memory for ad headlines featuring positive words would be better when the processing demands of primary task are relatively higher than when they are relatively lower. Similarly, high levels of emotional arousal demand attentional preference and orient attention responses (Nielsen et al. 2010). Thus, the same prediction might be expected for high arousing emotional stimuli under high primary task demands than under low primary task demands.

H3: When advertisements irrelevant to the primary task appear on the right visual field, increasing the resource demands of the primary task (a) increases the recognition of ad headlines featuring positive words and (b) does not affect the recognition of ad headlines featuring negative words.

H4: When advertisements appear outside the area of focal attention, increasing the resource demands of the primary task (a) increases the recognition of ad headlines featuring high arousal words and (b) does not affect the recognition of ad headlines featuring low arousal words.

2.5. Web Information Type

Distinct web information types involve different processing resources which may impact users' attention toward advertisements. According to the eye-tracking study on viewing webpages, the sequential path of text-reading task and the non-sequential feature of picture-viewing task indicate that viewers execute different strategies for perceiving information (Tang & Jhuang 2005). That is, executing text-reading and picture-viewing tasks involve different mental processes and visual perceptions (Sipe 1998). Based on Nielsen's (2007) research, text is more likely to engross users in the text reading, making advertisements less likely to be seen. In contrast, during picture-viewing situation, the banner advertising visually integrates into the main content, increasing its chance to be seen. Therefore, consumers seem to apply different information processing strategies and attend differently to advertising when viewing a webpage in text format versus in picture format.

In a recent study, Hsieh and Chen (2011) proposed four common information types (text-based, text-picture mixed, picture-based and video-based information) and explored the perception of internet advertising on a structured series of similarly themed pages. The researchers found that the information type of viewing webpage played an important role in affecting a viewer's attention on banner advertising. Specifically, when people were asked to browse the pages in a relaxed manner, the picture- and video-based webpage received higher attention on banner advertising than the text-based and text-picture mixed webpage. Further, the result showed that the text-based webpage and text-picture mixed webpage could be classified as one similar level, while the picture-based webpage and video-based webpage as another level for advertising attention intensity.

In the present study, we examine the impact of web information type (text-based versus picture-based webpages) on the preattentive detection of emotion words in a cluttered online environment. Based on prior research findings, we propose:

H5: When advertisements appear outside the area of focal attention, the recognition of emotional headlines for text-based webpage is different from recognition for picture-based webpage.

3. Methodology

3.1. Participants

One hundred and twenty-eight undergraduate students at the Nanhua University, Taiwan participated in the experiment. Each participant was paid \$100 (NT) per hour for their participation. Separate groups of sixty-four participants took part in the text-based task and picture-based task. Each group of sixty-four participants was further divided into separate groups of thirty-two for the low processing load task and the high processing load task.

3.2. Layout of Experimental Webpage

The contents of the webpage were classified into two parts: (1) the main content for the primary task and (2) peripheral (nonfocal) target and distracter advertisements. These two parts competed for a viewer’s limited amount of attention resources. All target advertisements appeared in the right column, and the main content appeared in the left column. In addition to a target advertisement, each webpage had two distracter advertisements to mimic the cluttered online environment. On each page, one distracter advertisement was placed at the top of the webpage, spanning two columns. The other distracter advertisement was in the right column and below the target advertisement. The experimental advertisements were placed so that their centers were outside the area of attention when focusing on the primary task placed on the left hand side. Figure 2 depicts a schematic illustration of the webpage layout.

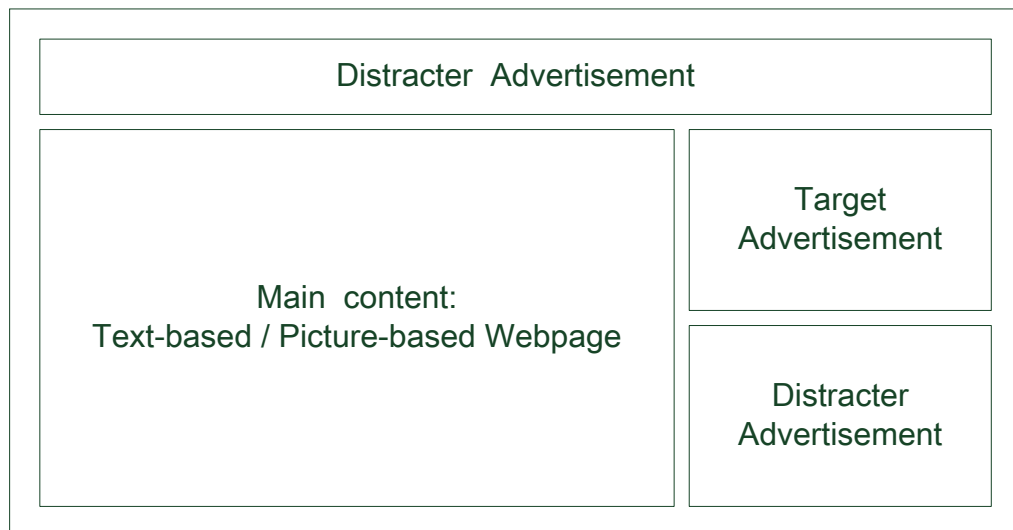


Figure 2. Schematic illustration of the webpage layout

3.3. Advertising Stimuli

The word stimulus set consisted of 8 words from the personality-trait adjectives (Pratto & Oliver 1991). To avoid the confounding effects of valence (desirable / undesirable) and arousal (slight / extreme) on ad recognition, four words rated as positive (e.g., “confident”) and four words rated as negative (e.g., “immature”) were selected. Within the four words, two words were rated as high arousal (e.g., “selfish”) and two as being

low arousal (e.g., “extroverted”). The target adjectives (valence vs. arousal) were embedded in a two- to three-word headline, creating eight headlines. In addition, four brand logos novel to the study population were selected. Brand logos were used to test whether feature analysis of emotional headline results in incidental exposure to other ad elements.

Each target advertisement comprised one headline and a brand logo. Eight advertisements were created using a 2 (valence: positive versus negative) X 2 (arousal: high versus low) X 4 (brand logo) X 8 (headline) within-subjects design, in which the headline was nested within target word valence and arousal. The ad headlines were centered and presented in 36-point Microsoft JhengHei font to maintain signal strength (Nielsen et al. 2010). Below the headline appeared a brand logo. Four logos were each presented twice to increase the potential exposure. Further, each logo was always associated with either two positive (high arousal) or two negative (low arousal) target word headlines. Similarly, each logo was always associated with either two high arousal or two low arousal target word headlines. Briefly, each participant saw all four brand logos and all eight headlines.

3.4. Web Contents

We adapted the primary task manipulation from prior studies (Janiszewski 1993; Nielsen et al. 2010), in which processing load and attentive resources were manipulated. Because we were interested in the effect of processing load on the recognition of peripheral advertisements, attentive resources were constrained by making time pressure salient. Processing load was manipulated as a between-subjects factor.

In the text-based webpage condition, to create a primary task that featured high and low processing load conditions, eight famous sightseeing spots were selected. Descriptions about these sightseeing spots were created as follows: The low (high) processing load condition featured fewer (more) meaningful words. The conditions did not differ in description length. Pretests with 30 participants confirmed that for all eight descriptions, the high processing load condition was rated as significantly more difficult to read.

In the picture-based webpage condition, to create a primary task that featured high and low processing load conditions, pictures were extracted from several online shopping websites. In the low (high) processing load condition, each webpage comprised four (sixteen) items from the same shopping product for a total of eight shopping categories (ex. shirts, shoes, hats, etc.). Pretests confirmed that the high processing load condition demanded more processing time.

3.5. Design and Procedure

The experiment was designed with web information type (text- versus picture-based) and processing load (high versus low) as between-subjects factors, and target word emotion (valence and arousal) as within-subjects factors.

In the text-based webpage condition, participants were told that they would read a series of descriptions of sightseeing spots and later in the study they had to answer questions about the sightseeing spots. In the picture-based webpage condition, participants were told that they would have to choose one item from each shopping webpage, either as gifts for their friends or for themselves. After finishing the task, pertinent data such as name, sex, education, etc. were recorded. In addition to the questions about the sightseeing spots, an

unexpected advertisement-recognition file was shown to the participants on the screen as ad memory test.

3.6. Dependent Measures

Recognition was used to evaluate participants' processing of target advertisements. After the experiment, the advertisement recognition file was shown on the computer screen. Four memory test pages were used for brand logos. Each page had three logos, one from the target advertisements and two distracters. Participants were asked to indicate if any one of the three logos had been presented during the experiment. Eight memory test pages were used for headlines. Each page had three headlines, one from the target advertisements and two distracter headlines featuring either the desirable or undesirable trait adjectives from Pratto and John (1991). Participants were asked to indicate if any one of the three headlines had been presented during the experiment.

4. Results

4.1. Headline Recognition for Text-based Webpage

In the text-based webpage condition, to test the effect of processing load on attention shifts to headlines featuring emotional words, the rates of correct recognition of headlines were analyzed in a 2 x 2 x 2 mixed ANOVA crossing valence (positive vs. negative) and arousal (high vs. low) as within-subjects variables and processing load (high vs. low) as a between-subjects variable. The analysis did not reveal the main effect of headline word valence predicted in H1 ($F(1, 62) < 1, p > 0.1$). In contrast, the analysis revealed the main effect of headline arousal ($F(1, 62) = 13.222, p < 0.001$). In support of H2, headlines featuring high arousal words were recognized more often than headlines featuring low arousal words ($M_{\text{high arousal}} = 0.47, M_{\text{low arousal}} = 0.29$).

Figure 3 illustrates the effect of processing load on emotion headlines processing. As H3 predicted, the analysis revealed an interaction between headline word valence and processing load ($F(1, 62) = 4.864, p < 0.05$). Confirming H3a, planned contrasts revealed that participants recognized significantly more positive emotional headlines in the high processing load condition than in the low processing load condition ($M_{\text{positive/high processing load}} = 0.48, M_{\text{positive/low processing load}} = 0.31, F(1, 62) = 7.532, p < 0.01$). Consistent with H3b, the result revealed no effect of processing load for negative emotional headlines ($M_{\text{negative/high processing load}} = 0.38, M_{\text{negative/low processing load}} = 0.35, F(1, 62) < 1, p > 0.1$).

While the analysis did not reveal an interaction between headline word arousal and processing load ($F(1, 62) = 1.012, p > 0.1$), the recognition performance was in accord with the predicted direction. In partial support of H4a, planned contrasts revealed that participants recognized significantly more high arousal emotional headlines in the high processing load condition than in the low processing load condition ($M_{\text{high arousal/high processing load}} = 0.53, M_{\text{high arousal/low processing load}} = 0.41, F(1, 62) = 3.172, p < 0.08$). Consistent with H4b, the result revealed no effect of processing load for low arousal emotional headlines ($M_{\text{low arousal/high processing load}} = 0.30, M_{\text{low arousal/low processing load}} = 0.28, F(1, 62) < 1, p > 0.1$).

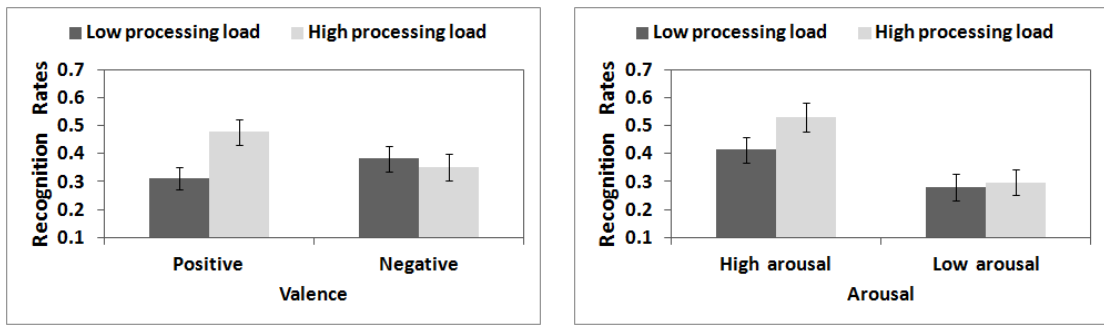


Figure 3. Recognition rates of ad headlines across emotional valence, arousal, and processing load for text-based webpage

4.2. Headline Recognition for Picture-based Webpage

In the picture-based webpage condition, to test the effect of processing load on attention shifts to headlines featuring emotional words, the rates of correct recognition of headlines were analyzed in a 2 x 2 x 2 mixed ANOVA crossing valence (positive vs. negative) and arousal (high vs. low) as within-subjects variables and processing load (high vs. low) as a between-subjects variable. The analysis revealed the main effect of headline word valence predicted in H1 ($F(1, 62) = 41.351, p < 0.001$). In support of H1, headlines featuring positive words were recognized more than headlines featuring negative words ($M_{\text{positive}} = 0.54, M_{\text{negative}} = 0.26$). Further, the analysis revealed the main effect of headline arousal ($F(1, 62) = 57.531, p < 0.001$). In support of H2, headlines featuring high arousal words were recognized more than headlines featuring low arousal words ($M_{\text{high arousal}} = 0.55, M_{\text{low arousal}} = 0.25$).

Figure 4 illustrates the effect of processing load on emotion headlines processing. The analysis revealed a marginal significant interaction between headline word valence and processing load ($F(1, 62) = 3.422, p < 0.07$). However, the results demonstrated opposite trend to what was expected. In contrast to H3a, the result revealed no effect of processing load for positive emotional headlines ($M_{\text{positive/high processing load}} = 0.56, M_{\text{positive/low processing load}} = 0.52, F(1, 62) < 1, p > 0.1$). Contrary to H3b, planned contrasts revealed that participants recognized significantly more negative emotional headlines in the low processing load condition than in the high processing load condition ($M_{\text{negative/high processing load}} = 0.20, M_{\text{negative/low processing load}} = 0.32, F(1, 62) = 4.966, p < 0.05$). Inconsistent with H4, the analysis did not reveal an interaction between headline word arousal and processing load ($F(1, 62) < 1, p > 0.1; M_{\text{high arousal/high processing load}} = 0.52, M_{\text{high arousal/low processing load}} = 0.58, F(1, 62) = 1.093, p > 0.1; M_{\text{low arousal/high processing load}} = 0.24, M_{\text{low arousal/low processing load}} = 0.27, F(1, 62) < 1, p > 0.1$).

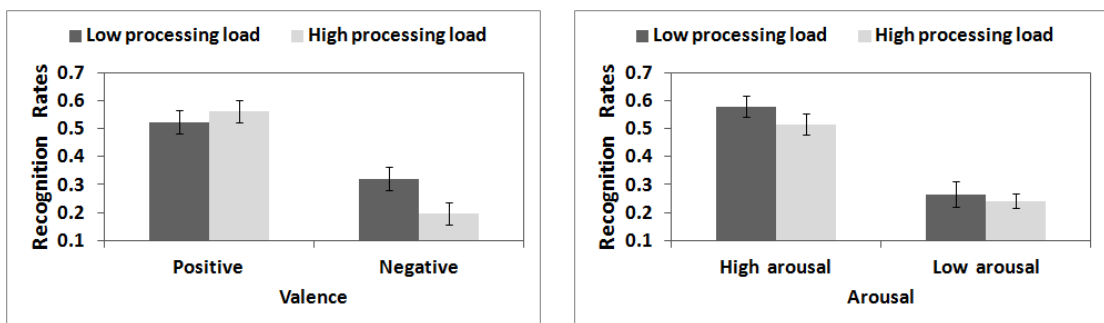


Figure 4. Recognition rates of ad headlines across emotional valence, arousal, and processing load for picture-based webpage

4.3. Comparison of Web Information Type for Headline Recognition

To examine the effect of web information type on attention shifts to headlines featuring emotional words, the rates of correct recognition of headlines were analyzed in a 2 x 2 x 2 mixed ANOVA crossing valence (positive vs. negative) and arousal (high vs. low) as within-subjects variables and web information type (text-based vs. picture-based) as a between-subjects variable. As shown in Figure 5, the analysis revealed an interaction between headline word valence and web information type ($F(1, 126) = 16.122, p < 0.001$). While in the picture-based condition positive emotional headlines were recognized more often than negative emotional headlines ($M_{\text{positive/picture-based}} = 0.54, M_{\text{negative/picture-based}} = 0.26, t(63) = 6.310, p < 0.01$), in the text-based condition the difference between positive and negative emotional headlines was not significant ($M_{\text{positive/text-based}} = 0.39, M_{\text{negative/text-based}} = 0.37, t(63) < 1, p > 0.1$). In addition, headlines featuring positive words were recognized more often in the picture-based condition than in the text-based condition ($M_{\text{positive/picture-based}} = 0.54, M_{\text{positive/text-based}} = 0.39, F(1, 126) = 11.775, p < 0.001$). In contrast, headlines featuring negative words were recognized more often in the text-based condition than in the picture-based condition ($M_{\text{negative/picture-based}} = 0.26, M_{\text{negative/text-based}} = 0.37, F(1, 126) = 6.332, p = 0.013$). Confirming H5, with regard to headline word valence, the recognition performance for text-based webpage was different from recognition performance for picture-based webpage.

In contrast, the analysis revealed no interaction between headline word arousal and web information type ($F(1, 126) = 2.973, p > 0.05$). In the picture-based condition, participants recognized significantly more high arousal than low arousal emotional headlines ($M_{\text{high arousal/picture-based}} = 0.55, M_{\text{low arousal/picture-based}} = 0.25, t(63) = 7.630, p < 0.001$). Similarly, in the text-based condition, participants recognized significantly more high arousal than low arousal emotional headlines ($M_{\text{high arousal/text-based}} = 0.47, M_{\text{low arousal/text-based}} = 0.29, t(63) = 3.636, p = 0.001$). Inconsistent with H5, with regard to headline word arousal, the recognition performance showed no difference between text-based webpage and picture-based webpage.

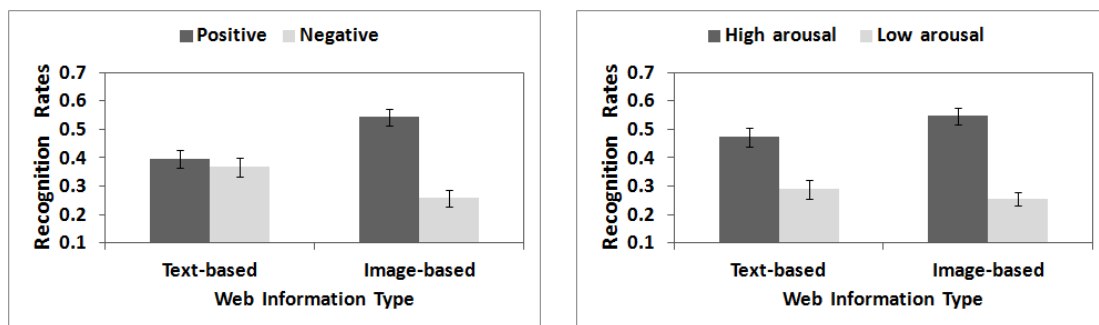


Figure 5. Recognition rates of ad headlines across emotional valence, arousal, and web information type

5. Discussion

The research findings showed that embedding emotional words into nonfocal ad headlines results in increased explicit memory for headlines featuring those words. Evidence supports that preattentively semantic analysis triggers subsequent attention shifts to emotional advertising headlines. Overall, headlines featuring positive words were recognized more often than headlines featuring negative words, especially in the picture-based webpages. Similarly, headlines featuring high arousal words were recognized more often than

headlines featuring low arousal words, in both text-based and picture-based webpages. In contrast to Nielsen and colleagues' (2010) findings, we found the main effect of headline word valence on headline recognition, which is possibly resulted from the experiment design: the advertisements appeared on the RVF in our study versus the LVF in Nielsen and colleagues' (2010) study. Different research findings could possibly be explained by that positive words presented to the RVF/LH are processed significantly more quickly and accurately than negative words (Ali & Cimino 1997; Holtgraves & Felton 2011), while positive and negative emotional words presented to the LVF/RH demonstrate comparable performance (Atchley et al. 2007; Mneimne et al. 2010; Nagae & Moscovitch 2002).

In addition, the effects of emotion on ad headlines recognition differ as a function of processing load and web information type. Under text-based webpage condition, when the primary task required a greater allocation of attentional processing resources, headlines featuring positive emotional words were recognized more than the same headlines in the low processing load condition. The effect of processing load is also evident for headlines featuring high arousal emotional words. These findings are consistent with preattentive resource strategy explanation, according to which more demands on the resources allocated to one hemisphere (the primary task) lead to matching resources in the opposing hemisphere allocated to preattentively process the secondary nonfocal stimulus. The higher level of available resources for preattentive processing improves the level of preattentive analysis of the irrelevant stimuli. As a result, the emotional content of a word is correctly identified more often on an unconscious level, thus facilitating memory trace and conscious recognition. In strong contrast, under picture-based webpage condition, when the primary task required a greater allocation of attentional processing resources, headlines featuring negative emotional words were recognized less than the same headlines in the low processing load condition. The effect of processing load did not interact with the arousal level.

Further, the result showed an interaction between headline word valence and web information type. While in the picture-based condition positive emotional headlines were recognized more often than negative emotional headlines, in the text-based condition the difference between positive and negative emotional headlines was not significant. Further, headlines featuring positive words were recognized more often in the picture-based condition than in the text-based condition, whereas headlines featuring negative words were recognized more often in the text-based condition than in the picture-based condition. Thus, to reach consumers in the midst of ad clutter, positive emotional headlines should be used in the picture-based webpage whereas both positive and negative emotional headlines could be used in the text-based webpage.

Our findings contribute important insights into preattentive processing research. First, the empirical evidence suggests that preattentive processing can extract enough semantic information from nonfocal verbal stimuli to determine the emotional content of a nonfocal word. Second, we extend research on attentional interference by demonstrating that the driver of attentional interference effects may be impacted by the visual field. Specifically, positive emotional headlines placed on the RVF have higher processing priority than negative emotional words. Finally, the comparison between text-based and picture-based webpage indicates that the recognition of positive emotional headlines outperform the recognition of negative ones in the picture-based webpage, whereas no valence difference in the text-based webpage. This provides the strategy of ad copy and placement for marketers. To reach consumers in the midst of ad clutter, positive emotional headlines should be used in the picture-based webpage whereas both positive and negative emotional

headlines could be used in the text-based webpage.

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國科會補助專題研究計畫成果報告自評表

請就研究內容與原計畫相符程度、達成預期目標情況、研究成果之學術或應用價值（簡要敘述成果所代表之意義、價值、影響或進一步發展之可能性）、是否適合在學術期刊發表或申請專利、主要發現或其他有關價值等，作一綜合評估。

1. 請就研究內容與原計畫相符程度、達成預期目標情況作一綜合評估

達成目標

2. 研究成果在學術期刊發表或申請專利等情形：

論文：已發表 未發表之文稿 撰寫中 無

專利：已獲得 申請中 無

技轉：已技轉 洽談中 無

其他：(以 100 字為限)

(Conference) Mei-Chun Wu (2012). "The effects of emotionality, web information type, and task demand on orienting attention responses in advertising", International Conference on Business and Information, July 3–5, Sapporo, Japan.

3. 請依學術成就、技術創新、社會影響等方面，評估研究成果之學術或應用價值（簡要敘述成果所代表之意義、價值、影響或進一步發展之可能性）（以 500 字為限）

行銷研究指出，字詞所具有的不同情緒效價（emotional valence）扮演引起注意力的重要角色。然現有的研究尚未有系統地探討情緒字詞所引起的注意力效果，是否受到網頁資訊型態及使用者任務負荷之影響。本研究檢視不同的網頁資訊型態是否造成對週邊廣告可用資源的差異。並檢視在以文字為主與以圖片為主的網頁內容情境中，廣告裡出現的言辭情緒線索是否會在前注意階段（preattentively）被察覺，以及是否被以不同的方式處理。此外，我們操弄任務負荷量以探究其如何影響注意力資源策略（前注意力 vs. 注意力）。

研究結果對於前注意處理提出幾個重要的洞見。首先，實證結果指出前注意處理可以從非中央視野的文字刺激物獲取足夠的語義資訊、決定情緒字的內容。其次，我們延伸注意力干擾之研究，證實注意力干擾的趨力受到視野的影響。當情緒字置於右視野（RVH, right visual field）時，正向情緒標題比負向情緒標題有更高的優先處理權。最後，比較以文字為主與以圖片為主的網頁，發現在以圖片為主的網頁中，正向情緒標題的再認記憶優於負向情緒標題；而以文字為主的網頁中，正負向情緒字的再認記憶則無差別。此可提供行銷人員對於廣告文案及配置的策略：在廣告充斥的環境中，在圖片為主的網頁中，廣告應使用正向情緒標題，而在文字為主的網頁中，正負向情緒標題皆可使用。

國科會補助專題研究計畫項下出席國際學術會議心得報告

日期：102年7月18日

計畫編號	NSC 101-2410-H-343-003		
計畫名稱	情緒、網頁資訊型態與任務需求對廣告注意力導向之影響		
出國人員姓名	吳梅君	服務機構及職稱	南華大學資訊管理學系 助理教授
會議時間	102年7月8日至 102年7月9日	會議地點	Prague, Czech Republic
會議名稱	(中文) 國際經濟與行銷管理研討會 (英文) International Conference on Economics and Marketing Management (ICEMM 2013)		
發表論文題目	(中文) 多工處理對衝動購買行為之影響 (英文) Multitasking influences impulse buying behavior		

一、參加會議經過

International Conference on Economics and Marketing Management (ICEMM)為跨領域之國際研討會，本研討會旨在促進科學與科技發展之研究及其對人類行為的影響，提供最新的科技議題討論交流的場域。本屆會議地點為捷克布拉格，會議時間為7月8日至7月9日。本次 poster 題目為”Multitasking influences impulse buying behavior”，會議期間也積極參加不同主題的 session 及 oral presentation，包含 Business Intelligence、Consumer Behavior、Financial Economics、以及 Organizational Behavior & Theory。

二、與會心得

1. 在 poster presentation 中，因能與研究者進行直接面對面的互動，而能深入了解研究的動機及重要性，並從中快速學習不同主題的研究者如何進行數據分析、結果呈現。儘管研究主題不同，一樣可以從其他研究者的方法中學習他人的智慧。
2. 數位學習動機的影響因素、消費者對於以不同成份組成的食物之接受度、賦稅競爭

對國家稅收之影響、虛擬組織在多層次行銷組織之管理，從個人層次、組織層次到社會層次來探討科技對人們的行為影響、國家政策對經濟之促進效果等，凡此等等都是個人於此研討會上所習得之科技發展對決策及行為影響之研究。

3. 很高興能參與這一場具研究深度度的國際研討會，令人無時不感受到科學研究的深奧，而研究者積極互動交流的態度，不僅深深吸引著我，更激起自己內在的研究熱情。

三、考察參觀活動(無是項活動者略)

無是項活動，省略

四、建議

在本次的會議上認識了許多來自其他領域及國家的研究學者，ICEMM 目前邁入第 5 年(自 2007 年開始)，由於包含主題相當廣泛，並可讓與會者自由參加任何一場 session，因此，對我們來說是一個不錯的觀摩。唯可惜的是，目前未能在研討會開始前於網站上提供論文摘要，讓與會者能在出席研討會前先行研究要聽取的報告場次。

五、攜回資料名稱及內容

1. ICEMM 2013 Conference Program
2. ICEMM 2013 Conference Abstracts
3. (CD) Conference Proceedings of ICEMM 2013, Prague Czech Republic, 08-09, July

國科會補助計畫衍生研發成果推廣資料表

日期:2013/10/31

國科會補助計畫	計畫名稱: 情緒、網頁資訊型態與任務需求對廣告注意力導向之影響
	計畫主持人: 吳梅君
	計畫編號: 101-2410-H-343-003- 學門領域: 行銷
無研發成果推廣資料	

101 年度專題研究計畫研究成果彙整表

計畫主持人：吳梅君		計畫編號：101-2410-H-343-003-				計畫名稱：情緒、網頁資訊型態與任務需求對廣告注意力導向之影響	
成果項目		量化			單位	備註（質化說明：如數個計畫共同成果、成果列為該期刊之封面故事...等）	
		實際已達成數（被接受或已發表）	預期總達成數（含實際已達成數）	本計畫實際貢獻百分比			
國內	論文著作	期刊論文	0	0	100%	篇	
		研究報告/技術報告	0	0	100%		
		研討會論文	0	0	100%		
		專書	0	0	100%		
	專利	申請中件數	0	0	100%	件	
		已獲得件數	0	0	100%		
	技術移轉	件數	0	0	100%	件	
		權利金	0	0	100%	千元	
	參與計畫人力 （本國籍）	碩士生	3	3	100%	人次	
		博士生	0	0	100%		
博士後研究員		0	0	100%			
專任助理		0	0	100%			
國外	論文著作	期刊論文	0	0	100%	篇	
		研究報告/技術報告	0	0	100%		
		研討會論文	1	1	100%		
		專書	0	0	100%	章/本	
	專利	申請中件數	0	0	100%	件	
		已獲得件數	0	0	100%		
	技術移轉	件數	0	0	100%	件	
		權利金	0	0	100%	千元	
	參與計畫人力 （外國籍）	碩士生	0	0	100%	人次	
		博士生	0	0	100%		
博士後研究員		0	0	100%			
專任助理		0	0	100%			

<p>其他成果 (無法以量化表達之成果如辦理學術活動、獲得獎項、重要國際合作、研究成果國際影響力及其他協助產業技術發展之具體效益事項等，請以文字敘述填列。)</p>	無。
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	成果項目	量化	名稱或內容性質簡述
科 教 處 計 畫 加 填 項 目	測驗工具(含質性與量性)	0	
	課程/模組	0	
	電腦及網路系統或工具	0	
	教材	0	
	舉辦之活動/競賽	0	
	研討會/工作坊	0	
	電子報、網站	0	
	計畫成果推廣之參與(閱聽)人數	0	

國科會補助專題研究計畫成果報告自評表

請就研究內容與原計畫相符程度、達成預期目標情況、研究成果之學術或應用價值（簡要敘述成果所代表之意義、價值、影響或進一步發展之可能性）、是否適合在學術期刊發表或申請專利、主要發現或其他有關價值等，作一綜合評估。

1. 請就研究內容與原計畫相符程度、達成預期目標情況作一綜合評估

達成目標

未達成目標（請說明，以 100 字為限）

實驗失敗

因故實驗中斷

其他原因

說明：

2. 研究成果在學術期刊發表或申請專利等情形：

論文： 已發表 未發表之文稿 撰寫中 無

專利： 已獲得 申請中 無

技轉： 已技轉 洽談中 無

其他：（以 100 字為限）

(Conference) Mei-Chun Wu (2012). 'The effects of emotionality, web information type, and task demand on orienting attention responses in advertising', International Conference on Business and Information, July 3-5, Sapporo, Japan.

3. 請依學術成就、技術創新、社會影響等方面，評估研究成果之學術或應用價值（簡要敘述成果所代表之意義、價值、影響或進一步發展之可能性）（以 500 字為限）

行銷研究指出，字詞所具有的不同情緒效價（emotional valence）扮演引起注意力的重要角色。然現有的研究尚未有系統地探討情緒字詞所引起的注意力效果，是否受到網頁資訊型態及使用者任務負荷之影響。本研究檢視不同的網頁資訊型態是否造成對週邊廣告可用資源的差異。並檢視在以文字為主與以圖片為主的網頁內容情境中，廣告裡出現的言辭情緒線索是否會在前注意階段（preattentively）被察覺，以及是否被以不同的方式處理。此外，我們操弄任務負荷量以探究其如何影響注意力資源策略（前注意力 vs. 注意力）。研究結果對於前注意處理提出幾個重要的洞見。首先，實證結果指出前注意處理可以從非中央視野的文字刺激物獲取足夠的語義資訊、決定情緒字的內容。其次，我們延伸注意力干擾之研究，證實注意力干擾的趨力受到視野的影響。當情緒字置於右視野（RVH, right visual field）時，正向情緒標題比負向情緒標題有更高的優先處理權。最後，比較以文字為主與以圖片為主的網頁，發現在以圖片為主的網頁中，正向情緒標題的再認記憶優於負向情緒標題；而以文字為主的網頁中，正負向情緒字的再認記憶則無差別。此可提供行銷人員對於廣告文案及配置的策略：在廣告充斥的環境中，在圖片為主的網頁中，廣告應使用正向情緒標題，而在文字為主的網頁中，正負向情緒標題皆可使用。