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**The Value of Implicit Measures for Internet
Advertising: Evidence of Mere Exposure Effects
and their Impact on Consumer Preference for
Pop-Ups and Banner Ads**

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the requirements for the degree of**

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Abstract

Cognitive and neuropsychological research points to evidence that “repeated, unreinforced exposure to a stimulus is sufficient to enhance one’s attitude toward that stimulus”, referred to as the *mere exposure effect*. The main purpose of this study is to bring to attention sources of mere exposure effects data that, while rarely cited within the advertising literature, are highly relevant to questions of online advertising effectiveness. This study further sought to 1) investigate whether if pop-ups would be better recognised than banner ads, and 2) whether if pop-ups would be rated more favourably (due to the mere exposure effect) than banner ads (less liked due to devaluation-by-inhibition). The experiment was a 2 (Group A, Group B) × 2 (Advert Type: Banner Ads, Pop-ups) × 2 (Whether Seen: Seen, Not Seen) design. Twenty participants were instructed to read twelve articles on the screen, where each reading trial was presented with a banner ad located in the peripheral display of the full-screen article, and a pop-up that was sequentially displayed at the centre of the screen which would be instructed to click away. A total of 48 adverts (i.e., previously seen and not-seen pop-ups and banner ads) were then rated on each of the five affective dimensions (i.e., familiarity, eye-catching, appealing, memorable, and distinctive); followed by a recognition question as to indicate whether participants had seen the advert whilst reading the articles. As predicted, mere exposure effects occurred for all previously exposed adverts, but no difference in recognition was found between the advert types or any significant differences in the magnitude of favourability for the previously seen pop-ups and banner ads. These findings suggest that the magnitude to which favourability would be related to varying lengths of exposure durations presented with pop-ups and banner ads (i.e., brief vs. longer presentation times), and/or the level of attention guided towards pop-ups and banner ads (i.e., central, had to be clicked away vs. peripheral, could be ignored), was not supported. Practical implications and suggestions for future research regarding potential applicability of mere exposure theory in an Internet setting will be discussed.

Introduction

Internet Advertising

Internet advertising has undoubtedly attracted an enormous amount of investment from the commercial advertising industry. According to the Interactive Advertising Bureau (IAB) (2007), Internet advertising revenue increased by 26% from \$US16.9 billion in 2006 to \$US21.2 billion in 2007. In recent years, the Internet has evolved into an important medium for advertisers and marketers for both branding and direct-selling purposes (Hoffman & Novak 1996; Shen, 2002). During 2007, total spending on Internet advertising exceeded that of radio and cable television (TV) in the United States (IAB, 2007). It has been predicted that Internet advertising spending could surpass that of magazine advertising by 2010 (ZenithOptimedia, 2007). The commercial domain is by far the largest and fastest growing segment on the World Wide Web, with consumer-related advertisers continuing to represent the largest category of Internet advertising spending, accounting for 55 % of total advertising revenues in 2007. In particular, display-related advertising (e.g., display ads, rich media) accounted for 34 % of full-year revenues in 2007. Driving this rapid growth is the fact that the Internet has been drawing sizable audiences from other types of media (e.g. TV, magazines), which has turned the Web into a far more attractive venue for mass market advertisers (IAB, 2007; Shen, 2002). Nielsen/NetRatings (2008) estimates there are more than 1.4 billion Internet users worldwide with this number expected to grow dramatically every year.

Technological innovations have made the Internet an attractive medium for advertisers. Server-based technologies enable advertisers to display banner ads according to user profiles and interests. As an advertising medium, the Internet offers all the elements of other media and much more. Banner advertisements (or more commonly known as banner ads) can include everything from simple text and graphics, streaming audio and/or video, to highly dynamic plus interactive banner ads delivered with rich-media animations (Shen, 2002). In addition to conventional banner-ads, interstitials (or pop-up

ads) represent another popular techniques used to deliver rich media ads that can contain more sophisticated messages on the Web (Huang & Lin, 2006).

The Effectiveness of current Internet advertising campaigns

The growth in Internet advertising comes with an increasing demand for effective advertising and media planning strategies. Despite the Internet's phenomenal growth, measurement and pricing practices on the Web are far from being standardised. Added to this is the need for accurate information and tracking of site traffic, advertising delivery, and user response for both Web publishers and advertisers (Shen, 2002). Although numerous efforts have been made to facilitate the process of developing viable measurement and pricing standards, such as guidelines proposed by the IAB in 1997 and 2002, attempts at standardisation thus far have been unsuccessful (Bhat, Bevans, & Sengupta, 2002). Ongoing discussions of measurement standardisation have been based on whether Internet advertising effectiveness should be assessed by direct response (i.e., click-through) or through mere exposure (i.e., impressions). Because the Internet enables advertisers to track responses to Internet ads, some reason that advertisers should pay for their ads on the basis of responses or performances, as evident in most online advertising campaigns that click-through to websites; while others argued that Internet ads have a role in creating brand awareness and image, and that such pricing and measurement methods would dismiss online advertising's brand-building value (see Danaher & Mullarkey, 2003; Shen, 2002 for reviews).

Despite the importance of this issue for both Web publishers and advertisers, there is little research available on the methodology used by advertising agencies to price, measure, and pretest Internet ads. A recent review by Shen (2002) has addressed this gap and sought to determine which measures and methods are being used to gauge the effectiveness of banner advertising. The majority of advertising agencies have indicated the use of click-through rates (i.e., the percentage of users who click on ad banners to connect to an

advertisers' site) and outcomes (i.e., the number of products purchased) to measure campaign effectiveness, rather than banner ad exposures or impressions (i.e., a broad indicator of the overall exposure of an ad that measures success in terms of visibility or brand recognition). This use of click-through has highlighted the interactivity of the Internet, indicating an active response toward advertising, rather than probable exposure to it which is believed to be essential in gauging the performances of online campaigns. Conversely, advertisers remained sceptical about the brand-building capabilities of online advertising, due to concerns that they have limited control, if any, on the exposure of advertised content. It is believed that the exposure-based approach may not be a good indicator of user involvement with an ad, as it does not track whether users interacted with the ad (Bhat et al., 2002; Hoffman & Novak, 1996).

Regardless of all this, there have been concerns that the accepted click-through approach may still not be appropriate to evaluate the success of online advertising campaigns (e.g., Shen, 2002). It is argued that relying on click-through as a metric of effectiveness could underestimate the brand-building power of online advertising. This argument points to evidence that online advertising can create a brand-building effect in the absence of click-through, based on the notion that measuring exposure to an ad can lead consumers to go directly to the site reference or look up the Website or product later, regardless of whether or not they click on the ad (Bhat et al., 2002; Briggs & Hollis, 1997). These concerns are also consistent with the evidence that online commerce has experienced a downturn in the recent past, as determined by declining click-through rates registered for most Internet advertising (Danaher & Mullarkey, 2003; Hanson 2000).

As a result, more recent studies have made attempts to use traditional survey research to provide insights into viewers' attitudinal motivations (e.g., Chandon, Mohamed, & Fortin, 2003; Danaher & Mullarkey, 2003; Hollis, 2005). These studies have relied on explicit memory retrieval using conventional measures, such as ad memory, brand awareness, and purchase intention, to anticipate attitudinal behaviours (Shen, 2002). For example, Dynamic Logic's AdIndex has become the industry standard for measurement of the

attitudinal effects of online advertising, which in one study has found that, a single exposure to an online advertisement can have a positive impact on online advertising awareness, total brand awareness, and purchase consideration (Hollis, 2005), as summarised by the observation that “the least 20 memorable advertisements negatively impacted brand favourability and purchase intent and had little to no impact on brand awareness and online ad awareness” (Mallon, 2005, cited in Hollis, 2005, p. 262). Similarly, Danaher and Mullarkey (2003) concluded that the longer a person is exposed to a web page containing a banner ad, the more likely one will remember the ad.

In contrast, cognitive and neuropsychological research points to evidence that affect is generated for a stimulus by merely exposing the subject to that stimulus repeatedly, referred to as the *mere exposure effect*, rather than being based on the cognitive processing of information (e.g., Zajonc, 1980, 2000). This strongly suggests that explicitly remembering an advert is unnecessary, and perhaps even irrelevant, to the change in attitudes that result from a single exposure to Internet advertising (Perfect & Askew, 1994). Therefore, open questions can be raised regarding the reliability of existing design and measurement methods used for online advertising – most importantly, can the traditional practices of advertising campaigns reliably determine the true impact of online advertising effectiveness? In summary, it still remains unclear as to whether or not Internet ads are effective as a medium for marketing communication.

Although there is greater interest in understanding which methods or measures work better in gauging Internet advertising effectiveness within the advertising literature (e.g., Shen, 2002), there is little available comparative and empirical research to resolve the debate. Given the similarities and differences between the Internet and traditional media, it is expected that mere exposure effects on the Web may differ or be similar in certain ways to traditional media (e.g., television commercials, print advertising), and this deserves further investigation (Hoffman & Novak 1996; Wong & Fortin, 1999). Specifically, it has been suggested that the majority of Internet advertisements do not receive any active processing due to the attention-demanding nature of tasks involved; this may imply that

Internet ads receiving limited attention compete for control over resources that may influence affective evaluation (Edwards, Li, & Lee, 2002).

However, the context of Internet advertising may somewhat differ from traditional media due to the interactive nature of the Internet. The online medium allows advertisers to present Internet ads in a form (e.g., pop-up, banner ads) that requires sufficient interest and motivation on the part of the consumers to interact with the advertisement and access appropriate information, rather than being passive recipients of the message (Hanson, 2000). In addition, given the empirical evidence from cognitive and neuropsychological research, it is striking that those who have recently drawn attention to the attitudinal outcomes (e.g., brand awareness) have largely dismissed the underlying mechanisms that would influence consumers' responses resulting from exposure to a banner ad, namely the mere exposure effect. Although empirical studies of mere exposure effects in an advertising context are still rare, growing research attention has shown the importance of non-conscious processes on consumer choice, suggesting that advertising effectiveness can be shown in the absence of explicit recollection. In particular, Perfect and Askew (1994) have shown the existence of mere exposure in print advertising by measuring unconscious effects of prior experience through implicit tests of memory.

In contrast to the widespread notion that the issue of online advertising effectiveness has been settled in favour of the direct response approach due to the universal measurement of click-through (e.g., Hollis, 2005), the main purpose of this study is to bring to attention sources of mere exposure effects data that, while rarely cited within the advertising literature, are highly relevant to questions of online advertising effectiveness.

Seeing Leads to Liking: Evidence from “mere exposure” effect for visual stimuli

The “*mere exposure effect*” has been referred to as the tendency for repeated exposures to enhance an affective response such as liking (Zajonc, 1980, 2000). The phenomenon was first suggested in the monograph on the “Attitudinal Effects of Mere Exposure”, in which Zajonc (1968) described the mere exposure effect as the observation that “mere repeated exposure of the individual to a stimulus is a sufficient condition for the enhancement of his attitude toward it. By ‘mere exposure’ is meant a condition which makes the given stimulus accessible to the individual’s perception” (p. 1). Zajonc interpreted that this growth in affect with repeated exposures was based on feelings of subjective familiarity or recognition. Following Zajonc’s (1968) initial observations, numerous demonstrations of the mere exposure effect have been reported, with overall findings supporting the phenomenon for a wide variety of stimuli (e.g., nonsense words, line drawings, polygon stimuli, photographs), exposure environments (e.g., laboratory, in *vivo* settings), rating procedures (e.g., forced-choice preference judgments, Likert-type ratings), psychological phenomena (e.g., advertising effects, social perceptions and behaviours, implicit memory), and populations (for reviews, see Bornstein, 1989; Harrison, 1977). In particular, Bornstein (1989) concluded, through his meta-analysis of over 130 experiments covering the 20-year period from the discovery of the mere exposure effect, which this effect has proven to be a robust, reliable phenomenon. Several significant findings from Bornstein’s (1989) review revealed that the mere exposure effect was: (1) stronger for complex vs. simple stimuli; (2) found with many kinds of affective ratings; (3) stronger with brief vs. long stimulus-exposure durations (< 5 s); and (4) independent of whether or not the stimulus was recognised when tested.

Some studies challenged Zajonc’s (1968) notion that subjective familiarity underlies the mere exposure phenomenon, suggesting that stimuli recognition is not necessary for the occurrence of exposure effects (Bornstein, Leone, & Galley, 1987; Kunst-Wilson & Zajonc, 1980; Moreland & Zajonc (1977, exp 1 & 2); Seamon, Brody, & Kauff, 1983a, 1983b). Early investigations by Moreland and Zajonc (1977, exp 1 & 2), based on optimally presented

stimuli (i.e., Japanese ideographs) with a multiple regression procedure, concluded that stimulus recognition was a sufficient, but unnecessary condition for the mere exposure effect to occur. However, these findings have been called into question over the appropriateness of procedures for assessing the independence of affect and recognition judgments (Bornstein, 1989; Moreland & Zajonc, 1979), for which the concern was later addressed by later studies using subliminal stimuli to attenuate recognition accuracy (e.g., Kunst-Wilson & Zajonc, 1980; Mandler, Nakamura, & Van Zandt, 1987).

Subliminal Presentation Paradigm

A somewhat more stringent test of the role of stimulus recognition in the mere exposure effect was conducted by Kunst-Wilson and Zajonc (1980). They investigated whether the mere exposure effect could occur when the stimulus was presented subliminally, under conditions where subjects indicated no recollection of the stimulus. In a series of experiments, subjects were presented with irregular polygons subliminally on a computer screen (i.e., 1-ms exposure durations), which subsequently led to chance performance in a subsequent recognition test. Despite the initial inability to recognise the 'old' items, subjects later displayed an affective preference for the previously presented octagons. Results showed that recognition performance was at chance level (48%) and that subjects *liked* the previously seen stimuli over the novel stimuli 60% of the time (Kunst-Wilson & Zajonc, 1980, p 558). The results led to conclude that affective reactions to stimuli can be acquired by virtue of prior exposure to the items even if not accompanied by a rational process such as recognition of the stimulus. The results also revealed that preference judgments for a stimulus can be established even through a single prior exposure, and that such attitude changes are obtainable with exposure durations as brief as 1- ms.

Additionally, the findings of Kunst-Wilson and Zajonc (1980) are somewhat in line with those of the fluency/liking relationships theory (Jacoby & Kelly, 1992), with a similar notion that repeated events are processed more fluently even by a single prior

presentation, and that the feeling of familiarity resulting from ease of processing serves as a basis for recognition memory (Bornstein & D'Agostino, 1992). Furthermore, Bornstein's (1989) comparison of studies using subliminal stimuli with studies of very brief, but recognisable, exposures (i.e., stimulus exposures of less than 2s) revealed that mere exposure effects can be more pronounced when obtained under subliminal conditions than when subjects are aware of the repeated exposures. Hence, these findings also suggested that stimulus recognition may actually inhibit the mere exposure effect (Bornstein, 1989; Bornstein & D'Agostino, 1992; Murphy, Monahan & Zajonc, 1995).

Kunst-Wilson and Zajonc's (1980) subliminal presentation paradigm has since been replicated in numerous experiments adopting similar stimuli and experimental procedures (e.g., Bornstein & D'Agostino, 1992; Mandler et al, 1987; Murphy & Zajonc, 1993; Seamon et al., 1983 a, b; Winkielman, Zajonc, & Schwarz, 1997). A considerable number of subsequent studies, which have successfully induced a non-conscious affect using subliminal stimuli, have concluded that subjective familiarity is not a necessary precondition for the growth of affect associated with exposure (e.g., Monahan, Murphy, & Zajonc, 2000; Murphy & Zajonc, 1993). For example, Monahan et al. (2000) have demonstrated that a positive affect, which was enhanced by subliminally and repeatedly presented polygons, was generated in response to new polygons, which were similar to the presented stimuli in shape and substance.

Consideration of the mere exposure effect has had broader impact where the phenomenon has also been found to occur with social-relevant stimuli such as photographs of people (e.g., Bornstein et al., 1987; Rhodes, Halberstadt, & Brajkovich, 2000). Similar demonstrations have also been reported by researchers studying issues in consumer behaviour, who looked at how mere exposure can be pertinent to more complex, integrated stimuli from preference to brand names, magazine adverts, to supermarket products (e.g., Baker, 1999; Perfect & Askew, 1994). This opens up a wealth of opportunity for investigating the application of exposure effect in the relatively unexplored area of computer-mediated advertising, which may prove to be a fruitful avenue for future

research (Hanson, 2000).

Affective Priming Hypothesis: Affect without Cognition

Kunst-Wilson and Zajonc's (1980) subliminal presentation paradigm disputed the cognitive priming hypothesis posited by Lazarus (1984), arguing that subliminal stimuli may initiate affective responding while bypassing cognitive processes. The *Affective Priming Hypothesis* (Zajonc, 1980, 2000) rose to prominence in the early 1980s with Kunst-Wilson and Zajonc's (1980) paradigm, proposing that affective preferences are independent of, and precede, a semantic analysis of the stimulus (Zajonc, 2000). It was demonstrated, through Kunst-Wilson and Zajonc's (1980) subliminal presentation paradigm, which the effect of repeated exposure on liking occurs even in the absence of conscious processing of the attitude toward stimuli. In other words, none of these mediating cognitive or motivational processes are required for the effect of liking. Thus, Kunst-Wilson and Zajonc (1980) suggested the possibility that affect and cognition may not be one complex process, but two distinct processes that may be partially separate and independent. Zajonc (1980) later augmented the affective priming hypothesis, claiming that emotion and cognition, although in virtually continuous interaction, are in fact separate systems and the affective system often commands temporal primacy. Controversially, Lazarus (1984) contested such claims that semantic processing must precede affective processing, arguing that cognitive appraisal, which may not be conscious, precedes emotional experience (see Zajonc (1984) for a review; Storbeck, Robinson, & McCourt (2006) for an argument in support for the primacy of semantic processing).

Although the primacy of affect vs. cognition debate has not been settled (Storbeck et al., 2006), many recent lines of research were cited to be consistent with the affective primacy position advocated by Zajonc (1980, 2000). Most notably, researchers have argued in support of this hypothesis of independence between affective and cognitive processing, demonstrating that different anatomical structures of the brain are involved in both of

these processes, and specifically linking of the amygdala to memory processes for emotional events and the preference judgment for visual stimuli (Bargh, 1997; Murphy & Zajonc, 1993; see Zajonc, 2000 for review). Barge (1997) pointed out that affective reactions influence evaluations automatically without mediation by consciousness or choice. Much of this work has pointed to the sub-cortical route to evaluation identified by Le-Doux (2000), which provided neuropsychological evidence for the primitive pathway of fear without thought as neurological processes; this illustrates how emotion can be experienced before cognition. Furthermore, affective priming studies have repeatedly shown that emotional pictures can modify people's attitude toward an associated object, even if they are unaware of the emotional primes (e.g., Bargh & Ferguson, 2000; Ghuman & Bar, 2006; Murphy & Zajonc, 1993; Winkielman et al., 1997). For example, Murphy and Zajonc (1993) have demonstrated that preference ratings for an object can be influenced by an unconsciously (e.g., 10ms) presented affective stimulus, such as smiling or angry faces.

Mere Exposure Effect and Advertising

One of the most obvious potential applications of the mere exposure effect lies in the area of advertising, partly due to the importance of changing attitudes to the advertising industry (Belch & Belch, 2004, p. 301; Bornstein, 1989; Wolfe, Horowitz, & Michod, 2007). The notion that peoples' attitudes can be influenced by repeated, unreinforced exposures toward a stimulus (i.e., an advert) has generated much interest in the areas such as television commercials and print advertising (e.g., Bornstein, 1989; Perfect & Askew, 1994), and the recently emerging medium of computer-mediated advertising (e.g., Hoffman & Novak, 1996).

In light of rapidly evolving media and associated advertising opportunities, advertisers continue to allocate large budgets to a variety of advertising tools; therefore, it is important for these companies to gauge whether these expenditures are delivering their intended goals and to focus on improving the effectiveness of their advertising (Perfect &

Askew, 1994). However, prior advertising research has been repeatedly questioned over advertisers' heavy reliance on explicit memory tests as measures of advertising effectiveness. This leaves open questions of whether current advertising design and measurement of advertising campaigns could reliably indicate the true impact of advertising effectiveness, particularly concerning the relatively under-researched area of Internet advertising.

Use of Explicit memory measures by Advertisers: 'Information only available if remembered'

A primary challenge in creating effective advertising has been to ensure that the advertisement not only attracts the target consumer's attention, but also generates interest and educates the consumer about product benefits and positioning (Menon & Soman, 2002). Research in this area has been based on the assumption that purchases are made on the basis of informed choice, i.e., in order to make an informed judgment an individual must have the information available, and information can only be available if it is remembered (Perfect & Askew, 1994).

Based on this logic, it is important to make sure information will be retained in the consumer's memory so that it will be available when it is time to make a purchase (Belch & Belch, 2004, p. 114). Hence, advertisers have tried to make their advertising messages as amusing and distinctive as possible, employing a variety of techniques such as shock tactics, catchy straplines, emotional appeals, and other creative devices (Baker, 1999; Lohtia, Donthu, & Hershberger, 2003). For example, ads using humour, sex, and other appeals that are entertaining, arousing, upbeat, exciting are thought to affect the emotions of consumers and put them in a favourable frame of mind. Thus, it is generally believed that emotional advertising is better remembered than non-emotional messages (Batra & Ray, 1986; Belch & Belch, 2004, p. 270). Similarly, Lohtia, Donthu, and Hershberger (2003) cited Internet advertising studies suggesting the use of creative execution in Internet

advertisements impacts branding and recall, including interactive elements (e.g., flash), larger size of brand logos, and advertisement positions (e.g., interstitial). Prior studies investigating memory for advertisements of such kinds typically expose participants to advertisements and then, after a short delay, require them to recall or recognise information that appeared in the ads (Shapiro & Krishnan, 2001).

This emphasis on recall-related behaviours has gained a deeply rooted popularity in practice, for which prior advertising studies investigating memory for advertisements have relied almost exclusively on examining effects contingent on explicit memory retrieval (see, for example, Batra & Ray, 1986; Danaher & Mullarkey, 2003; Friestad & Thorson, 1993; Lohtia et al., 2003). This form of memory retrieval requires consumers to think back to a prior exposure episode in an attempt to retrieve information from memory associated with that episode (Schacter, 1987). Memory measures including free recall, cued recall, and recognition have been the predominant tests used to assess memory performance, by which each of these tests makes explicit reference to, and require conscious recollection of, a specific prior episode (Perfect & Askew, 1994).

However, research measuring advertising effectiveness using these explicit memory tests has been somewhat mixed. Studies in this area have shown that a lengthy delay between ad exposure and test, as well as divided attention during the ad exposure episode, all hinder or even eliminate successful explicit memory retrieval (e.g., Shapiro & Krishnan, 2001; Singh, Rothschild, & Churchill 1988). In particular, researchers have found that recall scores vary widely on retest, underestimate the effectiveness of emotional ads, and often fail to correlate with purchase behaviour or actual product choice (e.g., Friestad & Thorson, 1993; Singh & Cole, 1989). For example, Friestad and Thorson (1993) argued that if tested properly, emotions may have substantial effects on consumer memory. Their results led to the conclusion that the use of free recall, or an episodic memory task, as compared with the typical semantic retrieval cues (i.e. product category cues) contained in the customary cued recall measures, may lead to faster, and higher recall of emotional advertisements.

Comparable lines of findings have been found for the Internet advertising medium. Evidence about the effectiveness of this advertising medium has mainly come from industry reports (such as DoubleClick, IAB, or MSN) or advertising literature (e.g., Danaher & Mullarkey, 2003; Gong & Maddox, 2003). Other than the commonly adopted Internet measures, such as click-through rates, Internet advertising agencies tend to pretest or measure banner ads using conventional measures, such as brand attitude, ad memory, brand awareness, and purchase intention (Shen, 2002). These survey responses were typically captured by comparing the attitudes from those exposed to the test advertisement to those exposed to a control advertisement (Hollis, 2005). For example, Dynamic Logic (2000), an online research company specialising in measuring online advertising effectiveness, found that online banner advertising raises brand awareness by an average of 6%, based on more than 18,000 surveys covering multiple product categories.

Similarly, the IAB study (2001) conducted by Dynamic Logic, and the DoubleClick study (2001) conducted by Diameter, have jointly presented their findings showing that the use of larger ad size, Rich Media technologies (e.g., flash), interstitials, and standard banner ads have considerably increased brand measures, even at one exposure, including brand awareness, aided advertising awareness, ad attribute recall, and ad recall. In particular, The DoubleClick study (2001) presented striking results showing that interstitials work as much as 194% better at boosting brand awareness and recall.

However, the evidence that adverts are well remembered is extremely patchy, with these studies relying upon explicit measures, which may have disregarded the impact of advertising effectiveness concerning the effect of retrieval at a delay between ad exposure and provision of a memory test. For example, Singh et al. (1988) have found that both recall and recognition are affected negatively by time delay. Similarly, Krishnan and Chakravarti (1999) have argued with illustrated cases that an advertiser may have persisted with an ad based on high recall scores without taking into account poor

recognition and indirect test scores that signal serious discriminability problems.

Implicit memory measures: Evidence from cognitive psychology literature

Results on explicit memory have been repeatedly shown to be somewhat tenuous, yet it seems that advertisers have been reluctant to abandon the notion of using explicit memory tests to assess the efficacy of adverts (Michell, 1993, cited in Perfect & Askew, 1994). As a result, potential role or influence in the consumer choice process in advertising contexts is not clearly understood. A further possible role for memory in advertising emerges from consideration of work in cognitive psychology, which has drawn a crucial distinction between explicit memory tests such as recall and recognition, and implicit memory tests such as word stem or fragment completion (e.g., Duke & Carlson, 1994; Schacter, 1987), word identification (e.g., Jacoby & Dallas, 1981), and preference judgments (e.g., Kunst-Wilson & Zajonc, 1980).

These two distinct kinds of memory tests are susceptible to different kinds of manipulation to change attitudes, by which memory can be assessed explicitly by asking participants to recall or recognise prior events (as widely adopted by advertisers), or implicitly by engaging participants in apparently unrelated cognitive tasks that contain previously studied and unstudied stimuli (Perfect & Askew, 1994). Evidence suggests that tests of explicit and implicit memory do not respond similarly to the same experimental manipulations, for which it has been found that while depth of processing, divided attention, intentionality, and generation all affect explicit memory, these factors have either the opposite effect or no effect on implicit memory (Jacoby & Dallas, 1981).

Conversely, changes in modality, type font, and physical features of the stimulus all affect implicit, but have no effect on explicit memory (Roediger, Weldon, & Challis, 1989). The growing cognitive literature demonstrates that much information stored in memory is not available to such conscious retrieval, but is instead more implicit in nature, and is thus

accessed unconsciously or automatically (Schacter, 1987). This research may shed light on previously conflicting results by tapping into the unconscious effects of emotions on memory.

Jacoby's Attribution Theory of Memory: Fluency of Processing

Implicit memory effects were first observed in experiments that involved patients with amnesia (e.g., Hamann & Squire, 1997a); the findings demonstrated a normal mere exposure effect in subjects, despite a profound inability to recognize the exposed stimuli. Identification of this phenomenon led to studies with normal experimental participants (see, for example, Jacoby & Dalas, 1981; Schacter, 1987; Tulving, Schacter, & Stark, 1982), by which performance on various perceptual tasks, such as the word identification task (e.g., Jacoby & Dallas, 1981) was often enhanced for previously exposed items relative to unexposed items. This phenomenon is known as the *repetition priming* effect, that is the facilitation or bias in the processing of a stimulus as a function of a recent encounter with that stimulus (Butler & Berry, 2004; Roediger & McDermott, 1993). Stemming from roots in the attribution theory of memory, the fundamental notion of implicit memory is regarded as the non-intentional, non-conscious retrieval of previously acquired information (Jacoby & Kelly, 1992; Schacter, 1987).

Within the scope of dissociation between explicit and implicit memory processes, the perceptual fluency/attribution paradigm can be understood in terms of the contrast between automatic and consciously controlled information processing (see Jacoby & Kelly (1992) for a review). When presented with a stimulus that has been processed recently (either deliberately or incidentally), there are implicit memory effects whereby the perceptual system processes them more fluently. Usually, people experiencing such fluency for a stimulus do not report that their perceptual encoding processes for that stimulus have been enhanced. Rather, they will attribute these automatic effects to external sources resulting in a subjective experience, namely the properties of the stimulus

itself such as the apparent duration of a word (Masson & Caldwell, 1998, cited in Butler & Berry, 2004).

In a similar way, it has also been suggested that such fluency effects are attributed to liking (e.g., Bornstein & D'Agostino, 1992; Seamon et al., 1983). With regard to mere exposure effect, this ease of processing has been hypothesised to serve as the basis for preference judgment (Bornstein & D'Agostino, 1992). Thus, when asked to choose between previously shown and novel stimuli in a preference judgment task, subjects may prefer previously exposed stimuli (i.e., judged to be more appealing etc.) because they are easier to process although they do not remember why (Seamon et al., 1983a).

Despite research on implicit memory documenting a considerable amount of empirical support for its distinction from explicit memory (e.g., Schacter, 1987), it is argued that theories concerning the role or influence of implicit memory in the real world has been much neglected (Butler & Berry, 2001b, 2002). Arguably, only until recently has growing attention been guided toward the cognitive realm of consumer behaviour (Krishnan & Shapiro, 1996; Sanyal, 1992). A relatively small number of studies have emerged in the recent literature of applied cognitive psychology, in which their implicit evidence questions advertisers' reliance on explicit memory tests as measures of advertising effectiveness (see, for example, Butler & Berry, 2001; Butler & Berry, 2002; Buttle, Ball, Zhang, & Raymond, 2005; Buttle & Westoby, 2006; Coates, Butler, & Berry, 2006; Perfect & Askew, 1994; Krishnan & Chakravarti, 1999).

For example, Butler and Berry (2002) have assessed the influence of affective statements (i.e., additional information that are presented concurrently with the brand names) on performance of implicit and explicit memory tasks, by hypothesising that implicit memory retrieval may be successful even when deliberate attempts to retrieve information from the exposure episode fails. They have found that the mere presence of additional statements at study significantly reduced performance on a two-alternative forced recognition task, whereas the same manipulation had no effect on implicit preference judgement task

performance. Their results have suggested that because implicit memory does not rely on a directed search of memory, these manipulations have not been found to inhibit it to as great an extent; therefore, measures of prior experiences are valuable as indirect tests of memory (Butler & Berry, 2001; Schacter, 1987).

Prior advertising studies investigating memory for advertisements have relied almost exclusively on examining effects contingent on explicit memory retrieval; recent researchers from the advertising and consumer psychology area have increasingly called attention to the importance of non-conscious processes on consumer choice (see, for example, Baker, 1999; Bargh, 2002; Shapiro & Krishnan, 2001). Consistent with recent findings from cognitive research, these studies have found evidence of the impact of mere exposure on advertising stimuli (e.g., brand names, product packages, price information) that enhance brand evaluations or future buying decisions, even in the absence of cognitive processing and conscious assessment of messages (e.g., Chris, 1993; Franzen, 1994; Monroe & Lee, 1999; Shapiro, Macinnis, & Heckler, 1997). Moreover, various researchers have replicated the effects of processing type, word-frequency, name awareness and repetition and levels of processing found in the cognitive psychology literature for advertising based brand recall (e.g., Chung & Szymanski, 1997; Duke & Carlson, 1994; Krishnan & Shapiro, 1996). Overall, these studies have proposed the use of implicit memory measures as an alternative to the widely used explicit memory measures of advertising effectiveness.

Bridging the gap between implicit memory measures and advertising research

Although advertising has long incorporated the principles of mere exposure effect in designing and presenting their messages, current empirical studies of mere exposure in an advertising context are still rare (Baker, 1999; Bornstein, 1989). Similarly, while theoretical aspects of implicit memory have been studied extensively over the past three decades (Butler & Berry, 2006), this stream has made early progress in understanding the effects of

implicit memory in the cognitive realm of consumer behaviour, particularly in the relatively unexplored area of computer-mediated advertising.

It is noteworthy that the precise mechanisms of the phenomenon of mere exposure are still not well understood (Butler & Berry, 2004; Whittlesea & Price, 2001). However, cognitive and neuropsychological research has offered a strong argument for postulating that the mere exposure effect is an implicit memory manifestation, independent of explicit memory (e.g., Kihlstrom, Mulvaney, Tobias, & Tobis, 2000). These findings have shown the importance of non-conscious processes without cognition on consumer choice, suggesting that advertising effectiveness can be shown in the absence of explicit recollection. Growing research attention has recently been made by cognitive researchers in this regard (e.g., Butler & Berry, 2002; Chung & Szymanski, 1997; Krishnan & Shapiro 2001; Perfect & Askew, 1994; Sanyal, 2002). In particular, Perfect and Askew (1994) have demonstrated the existence of mere exposure in print advertising by measuring unconscious effects of prior experience through implicit tests of memory; their findings led to their conclusion that “explicitly remembering an advert is unnecessary (and perhaps even irrelevant), to the change in attitudes that result from a single exposure to print advertising” (p. 700).

Furthermore, recent lines of evidence emerging from the advertising field seem consistent with, if not supportive of, the notion of shifts in attitudes without the need of conscious recognition. Much of this work has pointed to similar concerns regarding the use of explicit memory measures as means of assessing advertising effectiveness, and has clearly addressed this gap in the advertising literature (e.g., Baker, 1999; Shapiro & Krishnan, 2001).

Notwithstanding such an overwhelming body of evidence, it is inevitably still a popular conception that explicitly remembering an advert is important to the advertising industry. Prior advertising studies (e.g., Batra & Ray, 1986; Friestad & Thorson, 1993) and practitioners investigating memory by consumers for advertisements have relied almost

exclusively on examining effects that were contingent on explicit memory retrieval, ignoring the potential impact of advertisements on consumers' implicit memory. Despite their evidence being widely criticised over inconsistent results from both cognitive and the emerging advertising research in support of implicit measures, it is still commonplace to find remarks from the literature, as follows:

- (1) "...the more often a stimulus was presented, the more likely the individual would to be (consciously) recognize it, and the more chances the person would have to intentionally consider and form an attitude about it" (cited in Bargh, 2001, p.26);
- (2) "An advertisement fails to do its work unless it persuades the consumer and the consumer remembers the message at purchase time" (cited in O'Barr, 2006); and
- (3) "... online advertising awareness was the precursor to further advertising effect. People must remember that they have seen a brand advertised if that advertising is likely to have a more substantial effect on the recipient's relationship with the brand"(cited in Hollis, 2005, p.261).

In summary, the citations above would seem to suggest that advertising practitioners and academics are still reluctant to abandon the notion of using explicit memory tests to test the efficacy of adverts. Clearly this warrants further investigation concerning the current applied issues of advertising design and measurement of advertising campaigns embraced by the advertising industry. This also shows that further research attention needs to be guided to address the identifiable gap between the two disciplines. Furthermore, it is surprising to find little available research in the area of computer-mediated advertising. Owing to the growing popularity of this medium, the issue of online advertising effectiveness appears to be an aspect that has been neglected and warrants further investigation.

Perfect & Askew (1994): Print Adverts are not remembered, but memorable

“Implicit memory is a reasonably robust framework for many applications in consumer behaviour. If the idea of consumer memory is restricted to existing recall/recognition tests then consumer researchers may be ignoring a potentially influential dimension of consumer evaluation and decision making. The notion of consumer memory may thus need to be expanded to include the concept of implicit memory” (Sanyal, 1992).

Perfect and Askew (1994) followed Sanyal’s (1992) line of argument in the discussion of prior cognitive research that has shown to measure unconscious effects of prior experience through implicit tests of memory that are independent of explicit recollection. In line with the cognitive literature, Perfect and Askew (1994) found the same pattern of findings using print advertising in an ecologically valid situation. The study investigated implicit memory for advertising material by designing an indirect test of memory for magazine adverts and found that subjects demonstrated no effect of consciously recognising an advert on favourability.

In their experiment, subjects were exposed to full-page colour magazine adverts in either an incidental or deliberate study condition, by which a set of adverts including the target adverts were subsequently rated on four salient dimensions (i.e., eye-catching, appealing, memorable, and distinctive), followed with a standard yes/no recognition test. Implicit memory was revealed by a difference in ratings over four scales between seen and unseen adverts that were found to be independent of recognition level and encoding conditions. Their results found that previously viewed adverts, whether deliberately studied or not, were rated more favourably. This data led to the conclusion that it is possible to show shifts in attitudes that are independent of explicit recollection, and that explicitly remembering an advert is therefore unnecessary.

This data further questions advertisers’ reliance on explicit memory tests as measures of advertising effectiveness. In line with Sanyal (1992) and more recent lines of arguments for

implicit memory measures, Perfect and Askew (1994) urge research to close the gap between explicit and implicit memory measures, with this statement: "... by ignoring the wealth of implicit memory research advertising researchers have seemingly limited their ability to demonstrate the true impact of advertising" (Perfect & Askew, 1994, p. 701).

The Scope of the Present Study

Further to the work of Perfect and Askew (1994), the present study aimed to test implicit memory by designing an indirect test of memory for advert stimuli (i.e., pop-ups and banner ads) in a pseudo-web setting, and sought to determine whether it was possible to demonstrate the same pattern of findings for Internet advertising.

The experimental design was similar to that used in the study conducted by Perfect and Askew (1994), but with the newer medium of web-style presentation as opposed to the magazine-style presentation. Specifically, participants were instructed to read a series of articles on the screen, where each reading trial would begin with the presentation of a full-screen article with an attached banner ad that was simultaneously displayed on the periphery of the article, and a pop-up that was sequentially displayed at the centre of the screen 5-s after the article initially appeared, which participants would be instructed to click away.

Participants were then asked to indicate whether they had seen the adverts (i.e., previously seen and not-seen pop-ups and banner ads) whilst reading the articles previously (rendering this a recognition question), by which to investigate whether if there was a difference between pop-ups and banner ads in recognition and that if it affected favourability towards the adverts. Affective evaluation was then measured over five affective dimensions (i.e., familiarity, eye-catching, appealing, memorable, and distinctive) between seen (target) and not-seen (novel) adverts (pop-ups and banner ads).

As discussed in the earlier sections of the paper, available cognitive and neuropsychological data strongly support the proposition that “repeated, unreinforced exposure to a stimulus is sufficient to enhance one’s attitude toward that stimulus” (Bornstein, 1989, p. 283). Hence, the present paper proposed that mere exposure effects would occur for both pop-ups and banner ads.

Affective Influences of Selective Attention: Investigating the Internet setting

The present study further sought to systematically control one's attentional state so that the influence of attention on emotional responses could be observed, by which to determine how participants process information on computer screens in the pseudo-web setting. Specifically, affective evaluation was measured to see whether if pop-ups and banner ads would be rated more (due to mere exposure effect) or less (due to devaluation-by-inhibition) favourably.

Research in this area was based on the assumption that visual attention and emotional systems coordinate activity to prioritise processing (e.g., Fenske & Raymond, 2006; Raymond, Fenske, & Tavossili, 2003). Prior research has demonstrated that selective attention has a robust impact on subsequent affective evaluations of abstract visual patterns (Raymond et al., 2003) and photographs of unfamiliar faces (Raymond, Fenske, & Westoby, 2005, exp. 3).

Raymond and colleagues (2003) were the first to demonstrate that visual attention could influence emotional evaluation. It was shown that evaluation of the emotional tone (cheery/dreary) of complex but meaningless visual patterns can be modulated by the prior attentional state (attending vs. ignoring) used to process each pattern in a visual selection task. Their main finding was that previously ignored stimuli, compared with previously attended or novel stimuli, were subsequently emotionally devalued (i.e., liked less). These results showed the generality of distractor devaluation to complex visual scenes,

suggesting that the inhibitory devaluation might play a significant role in everyday tasks.

Raymond et al. (2003) proposed an inhibition-based account of the influence of attention on emotion, namely the “*Devaluation-by-inhibition*” effect. Contrary to the phenomenon of mere exposure effect, this effect reveals that, in a given effortful visual selection task, previously ignored stimuli (i.e., distractors) may be evaluated more negatively than either previously attended or novel stimuli. By “devaluation” it is meant that the stimuli seen under some conditions are valued less than similar stimuli seen under other conditions.

Further to Raymond et al. (2003)’s work, the present study aimed to examine the possible effects of selective attention on subsequent affective evaluations in a pseudo-web setting, by comparing the magnitude of favourability in adverts that were either previously attended (i.e., pop-ups), or ignored (i.e., banners ads).

Investigation for Internet adverts: Pop-Ups and Banner Ads

In an Internet advertising context, the Web often represents an intensive information environment where only a subset of the information (i.e., the primary information) present within the communication medium will occupy focal attention. However, the remainder of the environment (i.e., peripheral stimuli) is not completely ignored. Given its attention-demanding nature of web-viewing, viewers often focus their attention on a primary task (e.g. reading an article), thus reducing the resources available to process peripheral stimuli (e.g. advertisement) surrounding the primary information (Edwards et al., 2002; Wong & Fortin, 1999). This may imply that previously viewed ads receiving limited attention compete for control over resources, which may influence affective evaluations.

In order to systematically control one’s attentional state, the present study’s test instructions emphasised that participants read the articles at their own pace, inducing the

process of *relaxed-viewing* in an experimental condition. This methodology entails an *exploratory web browsing* behaviour (i.e., surfing) which simulates how people normally experience the Web (Danaher & Mullarkey, 2003). Affective ratings were then compared for adverts that were previously attended (i.e., pop-ups had to be clicked to be removed) or ignored (i.e., banner ads), or were never seen before (not-seen ads).

Pop-Ups

Due to increased technological innovations of the Web, different forms of Internet ads can be programmed, which varies in the manner in which they are displayed. This in turn leads to the common situation where a viewer may be exposed to different forms of Internet ads (i.e., banner ads, pop-ups) on the same Web page at the same time. According to IAB's (2001) guidelines, pop-ups (formally termed interstitials) refer to a form of rich media ads that "automatically launch in a new browser window when a Web page is loaded". They are designed to appear when entering or exiting a Web page, after a certain amount of time on a Web page, or when a link is selected. The pop-up window then can be programmed to remain for a predetermined length of time or until the viewer chooses to close the window (Edwards et al., 2002).

The present study involved participants being exposed to a single brief presentation of a pop-up ad, while reading each article which also required them to attend to the pop-up by clicking it away. This methodology assesses the evidence for mere exposure effects when the advert is deliberately attended to (i.e., appears centrally over the article being read and has to be clicked away). This is similar to Perfect and Askews's (1994) deliberate study condition with print adverts.

Banner ads

In the Internet advertising context, conventional banner ads are distinct from pop-up ads in the manner in which they are displayed. Banner ads appear when viewing Web pages, usually at the top or along the sides of the page. They are generally displayed on the periphery in the manner that they do not interrupt the activity of Web viewers (Edwards et al., 2002).

The present study involved participants being exposed to a banner ad located in the peripheral display (left or right) of each reading article on the computer screen. While participants were given instructions to click away the pop-ups, no instructions would be given on banners, which differ in the sense that attention is not required toward the banner ads. This was intended to associate the ignored banner ads (i.e., distractors) with an inhibitory state. By inducing the ignoring process, the banner ads are regarded as intrusive advertising, which elicit a reduction in affect because of the distraction and accompanying inhibition it provokes. Because participants did not respond to the banner ads, attentional inhibition may be applied to the ignored banner ads as the articles (i.e., target) appeared. This might demonstrate that banner ads may be inhibited more, suggesting that underlying mechanisms other than mere exposure effect may be at work.

Contrary to the phenomenon of mere exposure effect, the theory of attentional inhibition offers an alternative account to the way selective attention might affect subsequent emotional evaluation in the computer-mediated setting. It would be striking to find that the selective ignoring process itself, as opposed to attending, appears to exert influence on emotional evaluation. If the phenomenon of attentional inhibition is successfully attributed to the banner ads tested in the current study, this might challenge the widespread belief that pop-ups are intrusive and distracting, and that peripherally placed banners are relatively non-distracting.

Exposure Durations and Mere Exposure Effects

Furthermore, prior research on subliminal mere exposure effects has demonstrated a robust exposure effect for visual stimuli presented so briefly at study that they were not recognised by subjects on a subsequent memory test (e.g., Bornstein et al., 1987; Bornstein & D'Agostino, 1992; Kunst-Wilson & Zajonc, 1980). These findings suggested that the effect is stronger with brief vs. long stimulus durations of < 5-s (Bornstein, 1989).

Based on this proposition, the present study further hypothesised that mere exposure effects may be more pronounced when obtained under conditions similar to the methodology of subliminal presentation through very brief, but recognisable, exposures for pop-ups (i.e., up to 5-s to click them away), than when obtained with relatively longer exposure durations (i.e., for banner ads), in which participants may be more likely to be aware of the repeated exposures.

On the other hand, banner ads are displayed for the same duration as reading each article, which simulates in the manner in which people normally experience the Web. Because participants experience relatively longer exposure durations with the banner ads than the pop-ups, it is anticipated that the positive relationship between mere exposure and affect toward banner ads would become weaker with an increasing level of familiarity. This proposition is in line with previous findings which suggested that stimulus recognition may actually inhibit the magnitude of the mere exposure effect (e.g., Bornstein, 1989; Bornstein & D'Agostino, 1992).

H1: Recognition and Advert Type Hypothesis:

Will pop-ups and banner ads be recognised with the same accuracy? (pop ups would have to be attended as they have to be clicked away, appear centrally over the article being read, and are presented relatively briefly; while banner ads could be ignored as they are peripheral and are displayed on the screen for longer). Hence, it is anticipated that pop-ups would be better recognised than banner ads.

However, this was not anticipated to influence the mere exposure effect as the past cognitive and neuropsychological research clearly indicated that stimulus recognition is not a prerequisite for the production of mere exposure effects (e.g., Kunst-Wilson & Zajonc, 1980; Monahan et al., 2000; Perfect & Askew, 1994).

H2: Mere exposure and Advert Type Hypothesis:

Will the mere exposure effect occur for both pop-ups and banner ads? (Pop-ups are attended, central, and brief, while banner ads could be ignored as they are peripheral). Hence, it is anticipated that pop-ups would be rated more favourably (due to the mere exposure effect) than banner ads (less liked due to devaluation-by-inhibition; collectively, this would provide evidence of attentional inhibition).

Methods

Participants

In total, twenty adults (12 female, 8 male) participated in the experiment. Of these, ten participated in Group A (i.e. set A stimuli), and ten participated in Group B (i.e. set B stimuli). All participants were selected from a convenience sample via advertisement, ranging in age from 18-40 years. Participants were selected to be first language English speakers who had been resident in New Zealand for at least 5 years. All participants reported normal or corrected-to-normal visual acuity and were naïve to the purpose of the experiment. Informed consent was obtained prior to participation (*Information sheet: Appendix 1*) and were debriefed at completion of the experiment. Each participant received a cash reimbursement of \$10 (NZ) for their participation.

Apparatus

The experiments were programmed in E-Prime 1.1 Software (Psychology Software Tools, 2002) and run on a Pentium desktop computer with a 17-in (45-cm) colour monitor. Participants were seated at a viewing distance of approximately 50cm from the screen. Testing was conducted in a sound-free laboratory room. Participants were supplied with a print-out that outlined the briefing instructions of the reading task prior to the experiment (*Reading task instructions: Appendix 2*).

Materials and Stimuli

Twelve articles were used in the reading task of the experiment. They were either digitally scanned from magazines or downloaded from the Internet. The article clippings were selected from magazines such as Listener and Scientific Mind, and downloaded via web in

the New Zealand Herald under the news section. All readings were selected for the purpose of easy reading and being interesting to general audiences. Each of the articles was selected to be a brief reading (approximately 250 words) and took approximately five minutes reading time. All articles were digitally sized to a full page presented on a grey background that fitted the screen.

A total of forty-eight adverts were used in the reading task which imitate real website advertisements in the Internet setting. Two types of target stimuli were used. These were (1) *Pop-Ups*: twenty-four advert images with brand names and associated brand logos and pictures displayed within imitation popup window borders; (2) *Banner Ads*: twenty-four advert images with brand names and associated brand logos and pictures captured to fit on the periphery of the reading articles (*See Appendix 3 for samples of the advertising stimuli used in the experiment*).

All advert images were either digitally scanned from magazines or downloaded from the Internet in the format originally displayed by that company. All advert were saved as Bitmap files to ensure maximum resolution and were slightly digitally manipulated (Photoshop, v.8.0) in contrast and colour to ensure quality. Each of the pop-ups was adjusted to similar height and width (approximately 220cm X 450cm) while maintaining its normal spatial proportions and scale. Similarly, each of the Banner Adverts was proportionally adjusted in size (approximately 450cm X 130cm) so that the height and width was approximate to the display of the reading articles. An attempt was made to select all the adverts from low-profile companies to limit the effects of prior learning and familiarity with adverts or associated brands (*An alphabeticised list of the adverts used is given in Appendix 4*).

There were two sets of target stimuli: Set A stimuli and set B stimuli. The first half of pop-ups and banner ads were assigned to set A stimuli (i.e. group A), while the remaining half of each advert type were assigned to set B stimuli (i.e. group B). In other words, the adverts viewed in A are the novel items in B, and the adverts viewed in B are the novel

items in A. These novel adverts served to test whether the effects of favourability were specific to stimuli just previously viewed in the reading task or whether they were generalised attitudes to adverts. The adverts in each of the target stimuli were then presented in two separate formats. (1) *Banner ads with Articles*: Banner ads displayed on the periphery of each of the twelve reading articles (presented alternately on the left or right hand side); (2) *Pop-ups and Banner Ads with Articles*: Pop-ups presented at the centre of the stimuli on the respective banner ads and reading articles.

Design

The experimental design was similar to that used in the study conducted by Perfect and Askew (1994), but with the newer medium of web-style presentation as opposed to the magazine-style presentation. The experiment was a 2 (Group A, Group B) x 2 (Advert Type: Banner Ads, Pop-ups) x 2 (Whether Seen: Seen, Not Seen) design, with the Group as the between subject factor, and Advert Type and Whether Seen as the within subject factors. Participants in each group were presented with the same sets of pop-ups and banner ads in the respective reading articles. The order of reading articles was randomized by the programme for each participant.

For the rating task, rating of each advert was preceded by a standard yes/no recognition question to indicate whether they had seen the advert while reading the articles. Participants then rated each advert regarding how 'familiar with the product or brand', and how 'eye-catching', 'appealing', 'memorable', and 'distinctive' is the advert, on a seven-point Likert-type scale (1-7), with the higher the score the more favourable. Participants in each group were randomly presented with a total of 48 adverts (sets A and B), half of which the participants had been exposed to.

Procedure

After providing informed consent, participants were presented with verbal briefing instructions and on-screen instructions that outlined the aim and the procedure of the experiment. Participants were informed that the study aimed to examine how people visually process information on computer screens in the Internet setting. On initiating the reading task, participants were instructed to read a series of articles on the screen at their own pace where pop-ups would appear and they should remove them by clicking a mouse. Once they had completed reading an article, they were to press the space bar to initiate the next article. Participants were also supplied with a briefing instructions sheet to familiarize them with the procedure.

Each reading trial would begin with the presentation of a reading article with an attached banner ad that displayed on the periphery of the article (presented alternately on the left or right hand side in an attempt to avoid practice effects). On pop-up trials, a pop-up was sequentially displayed at the centre of the screen 5-s after the article initially appeared. Participants were instructed to left click the mouse to remove the pop-up. The screen would then be returned to the preceding presentation of the full-screen article and the banner ad. When ready the participant would initiate the next article by pressing the space bar until completion of the twelve articles. Each article would take approximately five minutes to complete. In order to reduce fatigue effects, participants were then asked to take a 5-minute break before proceeding with the computer-guided rating task.

For the rating task, participants were to rate a total of 48 adverts (sets A and B) on the screen. For each of the adverts displayed on the screen, the computer would prompt the participant to indicate whether they had seen the advert while reading the articles (rendering this a recognition question), followed by the ratings on each of the five seven-point Likert scales (familiarity, eye-catching, appealing, memorable, and distinctive). The order of presentation of the adverts was randomized for each participant and responses were recorded by the program E-Prime. The rating task would take

approximately 20 minutes per participant to complete.

On completion of the experiment, the participants were debriefed and thanked for their time and participation. Each participant received \$10 for their participation. The experiment would take approximately one and a half hours per participant to complete.

Results

The experiment was a 2 (Group A, Group B) x 2 (Advert Type: Banner Ads, Pop-ups) x 2 (Whether Seen: Seen, Not Seen) design. The data were subjected to Repeated Measures ANOVAs (Analysis of Variance) with the Group as the between subject factor, and Advert Type and Whether Seen as the within subject factors.

Prior to analysis, filtering of the data required two participant data sets to be removed from the total data, due to a recording problem. One participant from each group was removed from the data set. Hence, a total of eighteen participants (9 participants in Group A, 9 participants in Group B) were used in the data analysis.

Familiarity Effects

Results found a main effect of Advert Type, $F(1, 16) = 8.691, p < 0.05$, where pop-ups were rated significantly higher on Familiarity ($M = 2.95, SD = .20$) as compared to banner ads ($M = 2.59, SD = .23$). However, there was also an interaction of Advert Type and Group, $F(1, 16) = 9.826, p < 0.05$, where the effect of pop-ups only occurred for group A ($M = 3.25, SD = .28$). The ratings for Group A banner ads, Group B pop-ups and banner ads, were all very similar with means and standard deviations of $M = 2.5, SD = .32$; $M = 2.66, SD = .28$; $M = 2.68, SD = .32$, respectively. This in turn needs to be interpreted in view of a 3-way interaction effect of Advert Type, Group, and Whether Seen, $F(1, 16) = 4.669, p < 0.05$. This

indicated that Group A only had significantly higher Familiarity scores with the seen pop-ups (*Mean familiarity ratings for each group for pop-ups and banner ads, previously seen and not-seen, are shown in Figure 1*). There were no main effects of group, nor whether seen, nor any other interactions involving Familiarity.

Due to the effect of Group on the Seen Pop-ups, individual Familiarity ratings were then examined per advert item in Set A Pop-ups to look for any large item variations. These items could then be removed from the analyses so that the effects would be clear and not confounded with individual item effects. For instance, if a pop-up had been particularly prominent to participants (due to its brand familiarity, colour or another feature) this would have affected the results. Therefore, filtering of the data was required when closer inspection revealed that four (Black Knight, Seek, P&G, Real Groovy) out of twelve individual advert items scored very high on the Familiarity scale within the Set A Pop-ups data. A second ANOVA was then conducted on the adjusted set of data where no main effects or interactions were found.

Therefore, all other analyses use this adjusted set of data, which removed the bias of Familiarity (*this will be thoroughly discussed in the Limitations section under the discussion*)

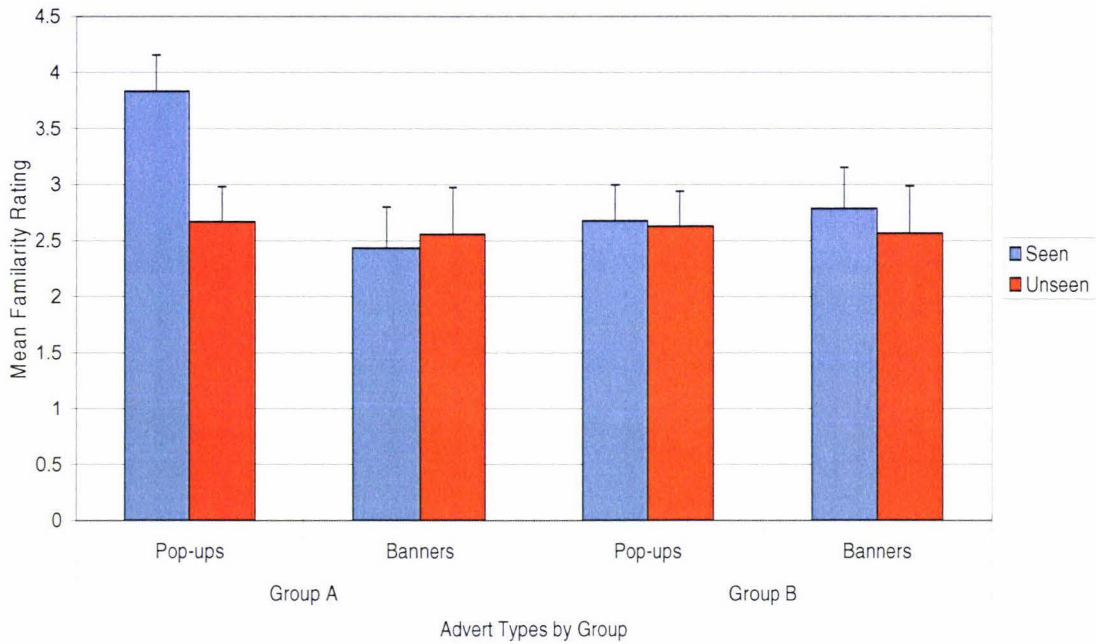


Figure 1: Mean Familiarity ratings for each group for pop-ups and banner ads, previously seen and not-seen.

Recognition

On average, the accuracy rates for recognising previously seen adverts were similar for both pop-ups (61%) and banner ads (62%). Group A correctly recognised 73% of previously seen pop-ups, and 65% of banner ads; group B correctly recognised 48% of previously seen pop-ups, and 59% of banner ads. False alarm rates were similar (8%) for both groups of participants.

The ANOVA concerned the recognition accuracy level for the adverts, as measured by the number of previously seen advert items that the participants claimed to correctly

recognise adjusted for items that were stated as recognised, but had not been shown (*false positives*). Therefore, Recognition score used was hits - false positives (as used in Perfect & Askew, 1994). Despite Group A's means being somewhat higher than Group B, a 2 X 2 ANOVA (Advert Type X Group) on Recognition scores found no significant main effects or interactions.

All of the following questions were subjected to a 2 (Group A, Group B) X 2 (Banner Adverts, Pop-up Adverts) X 2 (Seen, Not Seen) ANOVA design, as seen previously with the question of Familiarity (*The mean ratings for previously-seen and not-seen adverts items for each affective dimension are summarised in Figure 2*).

Distinctive

Results found a significant effect of Whether Seen, where the previously seen adverts were rated significantly higher on Distinctiveness than that of the not-seen advert items ($F(1, 16) = 9.194, p < 0.05$), indicating the existence of "mere exposure" effects. The mean advert ratings were 3.48 ($SD = .23$) and 2.88 ($SD = .21$), respectively. Distinctive scores found no other significant main effects or interactions.

Eye-catching

Results found a significant effect of Whether Seen, where the previously seen adverts were rated significantly higher on Eye-catching than that of the not-seen advert items ($F(1, 16) = 12.368, p < 0.05$), indicating the existence of "mere exposure" effects. The mean advert ratings were 3.8 ($SD = .26$) and 3.2 ($SD = .28$), respectively. There was also a significant interaction for the ratings of Whether Seen and Advert Type ($F(1, 16) = 4.5, p = .05$). Post-hoc t-tests revealed that while both types of adverts produced this effect of exposure, there was also a significant difference between previously Seen Pop-ups ($M = 3.77, SD$

= .28) and Not-seen Banner Ads items ($M = 3, SD = .29$), and also there was a significant difference between Not-Seen Banner Ads and Not-Seen Pop-ups ($M=3.39, SD = .28$). Eye-catching scores found no other significant main effects or interactions.

Memorable

Results found a significant effect of Whether Seen, where the previously seen adverts were rated significantly higher on Memorability than that of the not-seen advert items ($F(1, 16) = 10.671, p < 0.05$), indicating the existence of “mere exposure” effects. The mean advert ratings were 3.23 ($SD = .25$) and 2.58 ($SD = .22$), respectively. Memorability scores found no other significant main effects or interactions.

Appealing

Due to a recording problem, the data for Pop-ups were unusable, and hence the analyses on Appealing are based on Banner Ads only. Within the banner ads condition, the previously seen adverts ($M = 3.24, SD = .26$) were rated significantly higher on Appealing than that of the not-seen advert items ($M = 2.6, SD = .22$), indicating the existence of “mere exposure” effects, ($F(1, 16) = 5.673, p < 0.05$). Appealing scores found no other significant main effects or interactions.

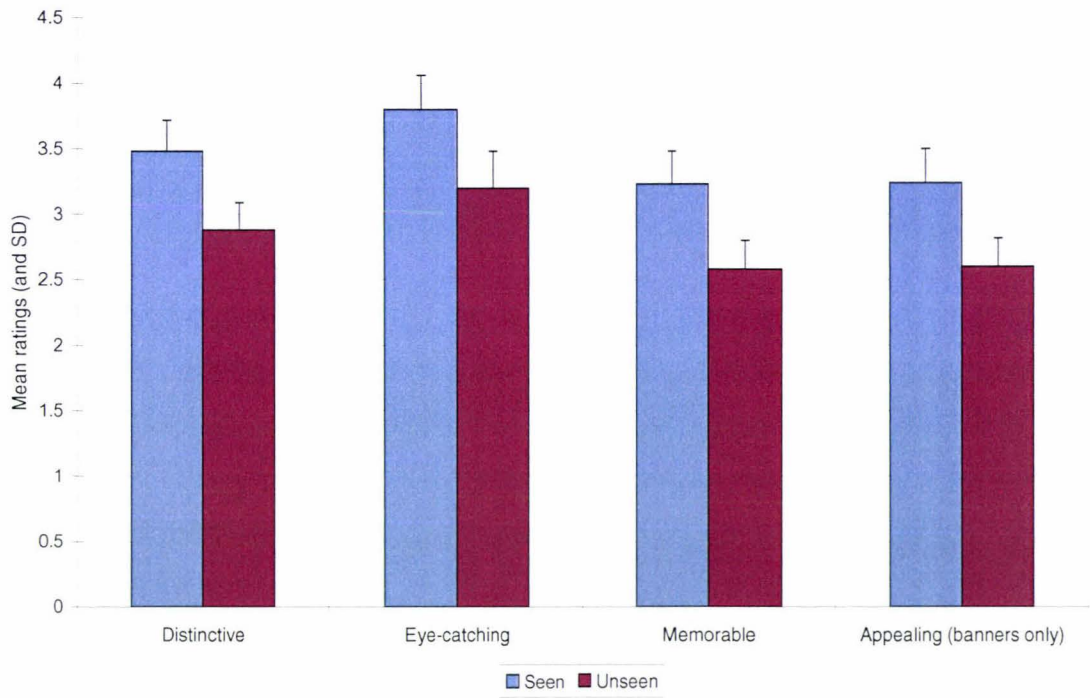


Figure 2: The mean (and SD) of ratings for previously-seen and not-seen adverts, on the four dimensions of distinctive, eye-catching, memorable, and appealing.

Overall analyses revealed that recognition data was non-significant; and that all the mean recognition accuracy scores were similar across banner ads and pop-ups for both groups of participants.

Overall, there was evidence of “mere exposure” effects for the four affective dimensions of distinctive, eye-catching, memorable, and appealing. On each of the four scales, the previously seen adverts (target items) were rated significantly more positively than that of the items that have not been previously seen (novel items). This held for pop-ups as well as banner ads for both groups. Further analyses also found no significant main effects or interactions on advert types over the affective ratings.

Discussion

Recognition and Pop-ups vs. Banner ads

Recognition data showed that despite group A had somewhat higher recognition accuracy on the pop-ups and banner ads than group B, no significant difference in the recognition accuracy scores was found. Overall analyses revealed that all the mean recognition accuracy scores were similar across banner ads and pop-ups for both groups of participants. The results suggest that previously seen pop-ups and banner ads were recognised with the same accuracy, and that the proposition that pop-ups would be better recognised than banner ads was not supported.

It was originally predicted that in the experimental condition of relaxed viewing in a pseudo-web setting, the level of recognition accuracy would vary in terms of advert types (i.e., pop ups would have to be attended as they have to be clicked away, appear centrally over the article being read, and are presented relatively briefly; while banner ads could be ignored as they are peripheral and are displayed on the screen for longer). Hence, it was anticipated that pop-ups would be better recognised than banner ads.

However, this was not anticipated to influence the mere exposure effect as the past cognitive and neuropsychological research clearly indicated that stimulus recognition is not a prerequisite for the production of mere exposure effects (e.g., Kunst-Wilson & Zajonc, 1980; Monahan, Murphy & Zajonc, 2000; Perfect & Askew, 1994).

Mere Exposure Effects and Pop-ups vs. Banner ads

The mere exposure effect was revealed by a significant difference in ratings over four affective dimensions (i.e., distinctive, eye-catching, memorable, and appealing) between previously exposed (target items) and not-seen adverts (novel items). As predicted, the

results showed that mere exposure effects occurred for both advert types, where an enhancement in attitudes was evident with repeated exposures toward the previously exposed pop-ups as well as banner ads. The results strongly support the past cognitive and cognitive neuropsychological findings that “repeated, unreinforced exposure to a stimulus is sufficient to enhance one’s attitude toward that stimulus” (Bornstein, 1989, p. 283).

It was also predicted pop-ups would show greater mere exposure effects than banner ads (due to devaluation-by-inhibition); this will be discussed in the following section.

This was not the case, however, as results found no significant main effects or interactions on advert types over the affective ratings (i.e., distinctive, eye-catching, memorable, and appealing), suggesting no difference in the magnitude of favourability for the previously seen pop-ups and banner ads.

Hence, the results did not support the proposition that the magnitude of the mere exposure effects would differ in terms of the varying lengths of exposure durations presented with the pop-ups and banner ads (i.e., brief vs. longer presentation times), and the level of attention guided towards pop-ups and banner ads (i.e., central, had to be clicked away vs. peripheral, could be ignored). This will be discussed thoroughly in the following sections.

Exposure durations and Pop-ups vs. Banner ads

It was originally predicted that mere exposure effects would be lessened for the banner ads in part due to the relatively longer exposure durations of the stimuli (as compared to relatively briefer presentation times with the pop-ups). It was thought that participants would be more likely to be aware of the repeated exposures as they were exposed to a given banner ad for the same duration as reading each article, and therefore would be

more likely to rate less favourable over the affective dimensions on 'eye-catching', 'appealing', 'memorable', and 'distinctive'.

This was predicted because it has been suggested that recognition improves with longer durations, and that stimulus recognition may actually inhibit the mere exposure effect (Bornstein & D'Agostino, 1992; Butler & Berry, 2004; Murphy et al., 1995; Ye and Raaij, 1997). For example, Ye and Raaij (1997) found that a high level of familiarity with stimuli may inhibit the mere exposure effect, in which affect would decrease when stimulus familiarity exceeded a certain level.

Conversely, it was also predicted that mere exposure effects would strengthen for the pop-ups due to briefer presentation times as compared with banner ads.

The available evidence suggests that, short exposures typically produce greater mere exposure effects than longer exposures (e.g., Bornstein, 1989; Bornstein & D'Agostino, 1992; Kurst-Wilson & Zajonc, 1980). Previous subliminal experiments have shown that mere exposure effect may be more pronounced when obtained under subliminal condition than when subjects are aware of the repeated exposures. For example, Bornstein and D'Agostino (1992) conducted experiments comparing the magnitude of the mere exposure effect produced by subliminal (i.e., 5-ms) stimuli and stimuli presented for longer durations (i.e., 500 ms). Their study found that subliminal stimuli produced significantly larger mere exposure effects, than did the supraliminal stimuli (by which subjects were more likely to be aware of the repeated exposures).

However, the proposition that the magnitude of the mere exposure effects differ in terms of the varying lengths of exposure durations presented with the pop-ups and banner ads was not supported, as the present results found no evidence for banner ads to be better recognised than pop-ups, and no significant differences in the magnitude of favourability between the advert types.

It could be argued that such pattern of results found in previous subliminal experiments (e.g., Bornstein, 1989) can only be demonstrated under the subliminal versus supraliminal exposure conditions, resulting in differences in the magnitude of the mere exposure effect. Based on this account, the greater mere exposure effect may result from one's misattribution of perceptual fluency to liking for a stimulus in the subliminal exposure conditions (Bornstein & D'Agostino, 1992). However, the present study did not obtain greater mere exposure effects for pop-ups which may possibly be due to a much longer range of supraliminal durations employed for a given pop-up stimulus (i.e., take approximately 5-s to remove a pop-up after its exposure), than other studies which incorporated some near subliminal durations (i.e., 5-ms). It is possible that a different pattern would have emerged for pop-ups which incorporated some near subliminal durations. This warrants further investigation.

Mere Exposure Effects vs. Attentional Inhibition

Furthermore, in addition to the varying lengths of exposure durations presented with the pop-ups and banner ads, it was also predicted that the level of attention guided towards the pop-ups and banner would further contribute to the proposition that pop-ups would be rated more favourably than banner ads.

In the experimental condition of relaxed viewing in a pseudo-web setting, pop-ups would have to be attended as they appear centrally over the article and have to be clicked away; however, while banner ads would not have to be attended as they are peripheral. And therefore, it was anticipated that pop-ups would be rated more favourably (due to the mere exposure effect) than banner ads (less liked due to devaluation-by-inhibition; collectively, this would provide evidence of attentional inhibition).

It was originally predicted that the ignored banners ads (i.e., distractor), as compared to the previously attended pop-ups, would be subsequently emotionally devalued (i.e., liked

less), due to the distraction and accompanying inhibition it provokes (evidence of attentional inhibition) (e.g., Raymond et al., 2003). However, interestingly, mere exposure effect was evident in banner ads (as well as pop-ups), regardless of the level of attention guided towards the adverts (i.e., attending versus ignoring).

The proposition that previously ignored stimuli may be evaluated more negatively than either previously attended or novel stimuli, is particularly interesting in light of the recent claims that under some conditions, the underlying mechanisms other than mere exposure effect may be at work (e.g., Fenske & Raymond, 2006; Raymond et al., 2003). Based on this account, it is argued that the persistent effect of ignoring the emotional evaluations of stimuli may serve to reduce the emotional salience of distracting stimuli so that, in future, they will be less likely to attract attention (Raymond et al., 2005). For example, when inhibition is applied to generally found mildly pleasant stimuli, such stimuli might reflect a process of affective neutralisation (i.e., a reduction in the emotional salience of previously inhibited stimuli). However, contrary to Raymond's (2003) theory of attentional inhibition, the present study found no evidence of "devaluation-by-inhibition" effect attributed to the banners ads. Further discussions on this topic will be followed in the *Practical Implications and Suggestions for Future Research*.

Familiarity effects

Initial results found significant difference in the familiarity scores on advert type, where pop-ups were found to be significantly higher on familiarity as compared to banner ads. However, further data analyses revealed that the effect on advert type only occurred for the *seen pop-ups within Group A*, where large item variations were found among four individual adverts within group A, which were then removed in order to avoid the bias of familiarity as the result of individual item effects (*this is discussed in more detail in the Limitations section*). The adjusted set of data has found no main effects of group, nor whether seen, nor any other interactions involving familiarity.

This demonstrated that mere exposure effects for pop-ups and banner ads for both groups occurred regardless of familiarity. This further supports the proposition that subjective familiarity is not a necessary precondition for the growth of affect associated with exposure (e.g., Kunst-Wilson & Zajonc, 1980; Monahan et al., 2000). A substantial body of literature can be found to support the proposition that the repeated exposure of an individual to a stimulus will enhance that person's familiarity with liking for the stimulus. This feeling of familiarity has been interpreted as a preference for the stimulus even though individuals are not aware of the preference formation process (e.g., Bornstein 1989; Mandler et al., 1987; Zajonc, 1980).

It is also interesting to note that, during debriefing, the participants were asked to casually speculate as to the possible evaluation outcomes of these adverts which they have just seen, after they were informed that half of the adverts (pop-ups and banner ads) were repeated during the rating task. The vast majority of participants predicted that the previously exposed pop-ups would lead to decreased liking, due to their perceived intrusive nature of the ad format (i.e., had to be clicked away while reading the articles). These naïve hypotheses clearly indicated that participants were not “aware” of the potential affective influence of these previously exposed pop-ups and banner ads. This lack of conscious recollection regarding the actual source of the affect, namely that repeated exposures leads to increased liking, strongly suggests the existence of mere exposure effect for these adverts.

Limitations

Bias of Familiarity Effects

Initial data analyses revealed that the familiarity effects occurred for the *seen pop-ups within Group A*, where large item variations were found among four individual adverts within group A (i.e., Black Knight, Seek, P&G, Real Groovy). These items were then removed from the group A pop-ups data set in order to avoid the bias of familiarity as the result of individual item effects. After removing the bias of familiarity from the initial results, the adjusted set of data has found no main effects of group, nor whether seen, nor any other interactions involving familiarity.

Given the limited amount of control over such real-world stimuli, it is possible that these individual advert items which score highly in the familiarity scale to be partly due to their physical features of the adverts (e.g., colour), or prior learning towards specific brands or adverts.

Familiarity effects: Physical features of the adverts

It has been suggested that implicit memory (but not explicit memory) is sensitive to factors such as physical features of the stimulus (e.g., Roediger et al., 1989). In this instance, the high familiarity scores for these individual adverts may be due to the result of their stimulus artefacts (e.g., bright, bold colour background). This was an unanticipated finding that a pre-test for the adverts prior to the experiment would be valuable to reduce the clumping of familiarity scores in future testing.

It is also important to note that using adverts that may be initially well-liked (or disliked) may illuminate the influence of affective responding, which may be reflected in their high familiarity scores. Past researchers have typically used neutral stimuli (e.g., nonsense

syllables) to avoid potential confounds (e.g., Bornstein, 1989). Hence, using Internet ads that are nonneutral (i.e., ads that are less likely to elicit strong emotional aspects) may also prove to be a fruitful avenue for future research.

Familiarity effects: Prior experience with adverts

Although care was taken to select adverts from low-profile companies to minimise prior experience with specific adverts and associated brands, some unidentified biases may have occurred due to the absence of pre-testing for these adverts prior to the experiment. In this instance, the 'Real Groovy' advert and its associated brand may be more 'noticeable' than anticipated due to its strong advertising exposure towards the younger audience in the New Zealand market (i.e., a majority of participants in this study).

Future research may suggest a pre-testing for the adverts to be devised prior to the experiment. For example, a selection of relatively unfamiliar internet adverts from low-profile companies, that are foreign to New Zealand audience, may be useful to reduce the bias of prior experience; a more randomised selection of adverts according to categories may also to be devised. This would mean that the participants may be exposed to a wider range of advertising categories that may reduce the clumping of familiarity scores.

Practical Implications and Suggestions for Future Research

Despite overwhelming evidence that casts doubt on the conventional marketing wisdom that 'I remember it therefore I like it', the potential application of implicit memory to the issues of advertising design and measurement of advertising campaigns have been overlooked (e.g., Shapiro & Krishnan, 2001). These concerns point to issues such as the reliability of existing design and measurement methods used for online advertising, and the kind of online advertising strategies that would best promote implicit memory.

The following sections will explore insights into the potential applicability of mere exposure theory in an Internet setting. In effect, these suggestions may provide future directions in issues as to what constitutes an effective online ad that are of potential value to managerial practice.

Quality vs. Quantity of advertising exposure

Some early research has suggested that number of stimulus exposures typically increases the size of mere exposure effect (e.g., Batra & Ray, 1986). Based on this notion, it is anticipated that 'advertising effectiveness increases with frequency of exposure'. Hence, online advertisers have tried to make their adverts as 'frequent' and 'intrusive' as possible, in an attempt to promote brand preference (Dreze & Hussherr, 2003; Perfect & Askew, 1994). As an advertising medium, the Internet often deliver intrusive advertising messages with repeated exposures which can be perceived as distracting and intimidating for web viewers. These can include everything from display ads such as pop-ups, rich media ads, to email spam.

Despite the notion of repetition has been embraced by the online advertisers as justification for intrusive image presentations, a considerable number of prior cognitive studies have demonstrated a robust mere exposure effect that result from a single prior

exposure (e.g., Kunst-Wilson and Zajonc, 1989; Perfect & Askew, 1994).

However, few other studies may suggest otherwise. For example, Bornstein (1989) has demonstrated in his early experiments that mere exposure effects peak after a fairly small number of exposures and level off after 10-20 stimulus presentations; the recent study by Butler and Berry (2004) suggest that multiple exposures might be most beneficial in the formation of new stimulus representations.

Although the present results suggest evidence that a single prior exposure is sufficient to preference formation, it is beyond the scope of the present study to claim the notion that repeated exposures may be unnecessary, or even irrelevant. Further studies should be guided in this regard in order to investigate the true impact of exposure frequency on online advertising effectiveness (i.e., quality vs. quantity of exposure). For example, future studies may wish to examine the impact on consumers' attitudes toward the ads as well as the brand name in regards to the frequency with which ads pop up, or presentations of multiple banner ads on the same Web page (Edwards et al., 2002).

It is believed that the issue of exposure frequency would be of considerable economic and social importance. Future investigations into the true impact of exposure frequency on online advertising effectiveness (i.e., weighing quality vs. quantity of exposure in practice) may lead to eventual marketing and financial benefits. Specifically, advertising agencies may wish to consider cutting down or readjusting the unnecessary use of Internet adverts on websites; future software development may also be potentially valuable for companies to test the success of their own online adverts. In effect, individual Internet users may also benefit from the corresponding reduction of intrusive and distracting display-ads on websites.

Investigation for Attentional Inhibition: Relaxed-viewing vs. Goal-directed context

One of the hypotheses in the current study tested whether if the ignored banners ads, as compared to the previously attended pop-ups, would be rated less favourably due to the distraction and accompanying inhibition it provokes (evidence of attentional inhibition). However the results suggest the otherwise, as mere exposure effect was evident in banner ads (as well as pop-ups), regardless of the level of attention guided towards the adverts (i.e., attending vs. ignoring).

Raymond et al. (2003) demonstrated that visual selective attention could influence emotional evaluations through systematically controlling one's attentional state (attending vs. ignoring) in a given effortful visual selection task. Thus it could be argued that such a pattern of results may only be demonstrated in the condition in which stimuli receiving limited attention compete for control over resources, given its attention-demanding nature of the task (Wong & Fortin, 1999).

Since the present study was tested through inducing the process of relaxed-viewing in an experimental condition (i.e., where participants were instructed to read the articles at their own pace), which simulates when viewers are mindlessly surfing through the Web without any specific purposes; and so the ignored banner ads may not be associated with an inhibitory state.

Perhaps a different pattern of results would have emerged if participants were involved in a task that is more effortful, attentional-demanding, within a goal-directed context (i.e., where participants were instructed to read the articles in a timed condition or instructed to read with an expectation that a quiz would follow after the reading).

It would also be interesting to track the eye movements of participants. This would allow examination of how much time and how many saccades are made to the pop-ups and banner ads in the pseudo-web setting. Further research attention should be guided in this

area.

Investigation of long-term effects underlying the mere exposure effect

It has been suggested in some studies that extending the range of other methodological variables such as inducing a longer delay between exposures and ratings would be useful in determining parameters and limits of the mere exposure affect (e.g., Bornstein, 1989; Bornstein, Leone, & Galley, 1987). In the current study, affective judgments on tested adverts were measured only under conditions of immediate responding. It would also be interesting to examine the duration of this attitude change towards the merely exposed Internet adverts over time.

Previous studies have indicated that implicit memory is insensitive to factors that manipulate explicit memory such as a lengthy delay between ad exposure and test (e.g., Shapiro & Krishnan, 2001). These studies have demonstrated that a delay between stimulus exposures and rating may result in a stronger mere exposure effect (e.g., Bornstein, 1989; Seamon et al., 1983b; Tulving et al., 1982). For example, Seamon et al. (1983b) have demonstrated that affective judgments for previously exposed polygon stimuli did not decline over time, and in fact, increased between 1-day, and 1-week postexposure periods.

Therefore, examination of true impact of online advertising effectiveness may result in a more accurate representation of the impact that Internet adverts can have on long-term memory. Investigation as to what extent typical mere exposure effects may be obtainable long after stimulus exposure under web-viewing conditions (e.g., 6 months following exposure) would be fruitful for future research and directions for online advertising campaigns.

Future Investigations for new online ad formats

Technological advances have opened up a wealth of opportunity to adopt a variety of advertising strategies and designs in the computer-mediated environment. In addition to the conventional pop-ups and banner ads, the relatively new ad formats, such as pop-unders, represent another popular techniques used to deliver rich media ads on the web. Also, the advent of more interactive forms of advertising now mean that advertisers can deliver dynamic and interactive ads (e.g., rich media ads that deliver high visual impact) that can contain more sophisticated messages on the Web. Therefore it will be worthwhile to expand the range of online advertising stimuli tested in future studies, in order to test how viewers are posed to these new ad formats (Edwards et al., 2002).

Furthermore, some studies have suggested that stronger mere exposure effects may elicited by more complex visual stimuli (e.g., with photographs), as compared to more simple stimuli (e.g., simple paintings and drawing) (e.g., Bornstein, 1989; Edwards et al., 2002; Fortin, 1997). Based on this notion, it would support the proposition that effects of mere exposure on ad attitudes may be moderated by the complexity of the ad. For example, Fortin (1997) has found support for the positive relationship between the level of vividness (i.e., the number of sensory dimensions, cues and senses presented, such as colours, graphics), level of interactivity of an advert and the level of arousal observed during exposure to the ad in an Internet setting. Future research should also be guided in this area.

Measurement and Design issues

The current study intends to raise concerns as to whether traditional practices of advertising campaigns could reliably determine the true impact of online advertising effectiveness. Despite confusion concerning the effectiveness of online advertising surrounds with discussions around measurement, it has been suggested that a majority of advertising agencies still remained to use click-throughs and outcomes (e.g., purchases of products), rather than exposures to gauge online advertising effectiveness (Huang & Lin, 2006; Shen, 2002).

The results of the present study led to question the existing Internet advertising research (e.g., Lohtia et al., 2003) that relies on explicit memory retrieval using attitudinal outcomes (e.g., brand awareness, ad memory) that have largely dismissed the underlying mechanisms of the mere exposure effect. In effect, these findings point to practical implications in which future practices of advertising campaigns may wish to address some basic issues regarding the exposure-affect relationship for adverts presented in the Internet setting.

The present study may also offer insights for future managerial implications as related to design and pricing issues of online advertising. For instance, should companies pay merely for 'click-through'? How do we quantify the exposure of an ad (i.e., quantifying the magnitude of ad favourability)? How do we quantify the effect of an ad that is not perceived as such? And how should the price of a banner ad vary based on its placement (top, left or right) and attributes (animated vs. static graphic), etc.

Contributions to Research

A considerable number of previous studies indicate that the mere exposure effect originally obtained by Kunst-Wilson and Zajonc (1980) and Seamon et al. (1984) with simple polygon stimuli is *robust* and *replicable*, and *generalisable* to complex, social-relevant stimuli such as photographs of faces (e.g., Bornstein, Leone, & Galley, 1987, exp 2). More recent studies emerged from cognitive and advertising literature have also found evidence of the impact of mere exposure effects to advertising stimuli (e.g., brand names, product packages, price information, and print adverts) to enhance brand evaluations or future buying decisions, even in the absence of cognitive processing (e.g., Baker, 1999; Monroe & Lee, 1999; Perfect & Askew, 1994; Shapiro & Krishnan, 2001). The present study extend the scope of the mere exposure effect to the pseudo-web setting, where an enhancement in attitudes was evident with repeated exposures toward the pop-ups as well as banner ads. The results from this study add to the growing literature of cognitive and cognitive neuropsychological research in an advertising context, specifically in an Internet setting.

The present study is also in line with existing cognitive and neuropsychological research (as well as the recent advertising research who made attempts to bridge the gap) that has offered a strong argument for postulating that the mere exposure effect is an implicit memory manifestation, independent of explicit memory (Butler & Berry, 2006; Duke & Carlson, 1994; Krishnan & Chakravarti, 1999; Krishnan & Shapiro, 1996; Kihlstorm et al., 2000).

Along with these recent findings, the present study support the notion that implicit memory for advertising material can be a more sensitive gauge of prior experience than explicit memory (e.g., Butler & Berry, 2001; Perfect & Askew, 1994). This is highly relevant to the (Internet) advertising context as it demonstrates that the unconscious automatic effects of mere exposure are distinct from the deliberate inferences that individuals may make about the conscious familiarity created by advertising exposure (Baker, 1999).

Conclusion

The results of the present study (i.e., evidence of mere exposure effects for both pop-ups and banner ads) led to question the online advertising research that have recently drawn attention to the attitudinal outcomes (e.g., brand awareness) that have largely dismissed the underlying mechanisms of mere exposure effect. The present study brings to attention sources of mere exposure effects data that, while rarely embraced by the Internet advertising industry, are highly irrelevant to online advertising effectiveness.

One important question for future research is to explore issues regarding the potential applicability of mere exposure theory in an Internet setting. Another interesting question will be to further investigate the underlying mechanisms other than mere exposure effect that may be at work in an Internet advertising context, namely the evaluation-by-inhibition effect as investigated in the current study. The present findings also suggest that a pre-test for the adverts prior to the experiment, may be valuable to reduce the clumping of familiarity scores in future testing. Answers to these questions hold practical implications concerning the online advertising design and measurement of advertising campaigns that could reliably indicate the true impact of Internet advertising effectiveness

Word Count: 15, 413

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Appendix 1: Information Sheet

Information Processing and Reading of Web-based Content

INFORMATION SHEET

Researcher Introduction

This piece of research is being conducted by Kuen Fong (Jenny) Cheung, as part of her Master of Arts degree specialised in Psychology, and supervised by Dr. Heather Buttle, an academic staff member in the School of Psychology at Massey University. Should you have any questions or concerns about the study, their contact details are:

Kuen Fong (Jenny) Cheung

Telephone: [REDACTED]

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Research Aim

Visual attention is an important aspect of human behaviour. It is important to people in many different settings, from supermarkets to all kinds of advertisements. This study aims to understand how people visually process information presented on computer screens in the internet setting.

Your role

This study will require you to read a series of articles (12 of them) on a computer screen. You are to read these articles at your own pace and you may move on to the next article by making a keyboard press. During the reading task, pop-ups will appear on your computer screen and you may remove them by clicking a mouse. The whole reading process should take no longer than 60 minutes. This study will then require you to complete a rating task guided by your computer. Your task is to respond each question by making a keyboard press and your responses will be recorded by the computer. This task should take no longer than 20 minutes.

- You should be proficient in English language, and should have English as your first language.
- You will be given a 10 minute break after reading the articles, prior to the rating task.
- You should be prepared to be seated at a computer screen for the duration of the study.

- You will receive a \$10 reimbursement fee to cover travel and time involved in the **1 ½ hour study (100 minutes maximum)**.

Confidentiality

- While you gave your name to the researcher when enquiring about the study, the information collected from you during the study is assigned a unique number that keeps your data anonymous.
- The data remains confidential with only the researcher and the research supervisor having access. It will remain secure at all times, with paper based data held in a locked file and computer based data stored on a computer where the researcher has sole access.

Your Rights

You have the right to:

- decline to participate;
- decline to answer any particular question;
- withdraw from the experimental session at any point, and withdraw your data up to a month after the experimental session was conducted;
- ask any questions about the study at any time during participation;
- provide information on the understanding that your name will not be used unless you give permission to the researcher;
- be given access to a summary of the project findings when it is concluded (please indicate on the consent form that you wish to receive a summary).

Project Contacts

- If you have any question before, during, or after the study, please contact the researcher and/or the research supervisor as detailed above. They will be more than happy to answer any queries.

Ethics Approval Statement

- This project has been evaluated by peer review and judged to be low risk. Consequently, it has not been reviewed by one of the University's Human Ethics Committees. The researcher named above is responsible for the ethical conduct of this research.

If you have any concerns about the conduct of this research that you wish to raise with someone other than the researcher(s), please contact Professor Sylvia Rumball, Assistant to the Vice-Chancellor (Ethics & Equity), telephone 06 350 5249, e-mail humanethicsouthb@massey.ac.nz.

Appendix 2: Reading task instructions

Sample article # 1

Pop-up

Pop-up appears on screen



Mouse click to remove



Keyboard press to move onto the next article

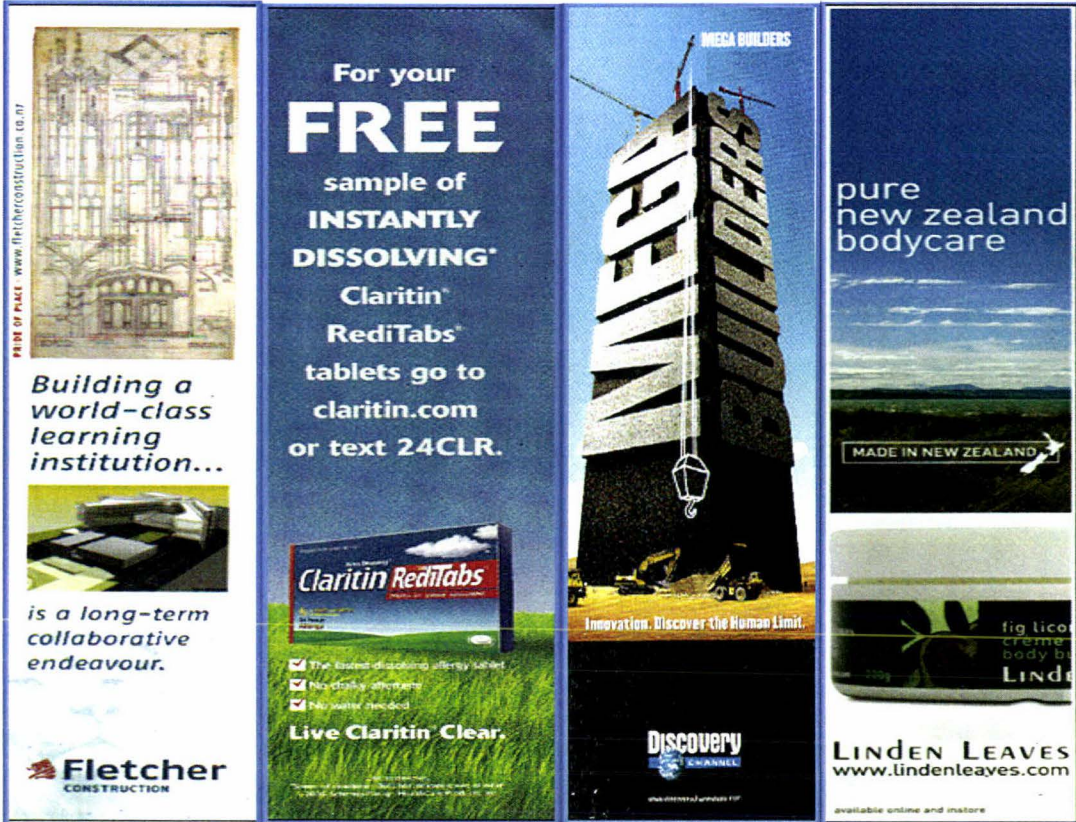


Sample Article #2 ...



YOU ARE TO READ THESE
ARTICLES AT YOUR OWN PACE

Appendix 3: Samples of the advertising stimuli used in the experiment



Appendix 4: An alphabeticised list of the adverts used in the experiment

AA Life
Audi
Bidz
Black Knight
BMW Finance
Bridgecorp
Business Week
Canderel Cystals
Change Training
Chartered Accountants
Claritin
Cool Water
Datatools
Discovery
Email Cash
Excel Learning
Fletcher Construction
Fuji Films
Ginkgo-Max
Good Health
Health Pro
Johnson's
Kent University
Kia Motors
Kiwibank
Libman Wonder Mop
Linden Leaves
Maori TV
Mojo Sound
New Scientist Jobs
Niche Media NZ Limited
One Square Meal
P & G
Paypal
Quaker
Real Groovy
Schmooze
Seek
Skoda
Synergy
Swirled Berries
Time
Unlimited
Waiwera Infinity water
Webdrive
Wises Map
Working Style
York Street