

## The Effects of Animation and Format on the Perception and Memory of Online Advertising

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### Abstract

Based on a general framework of consumer perception and processing of advertising, this study examines the impact of animation and ad format on the attention and memorization of online ads. Consumer attention to a variety of real-world ads was measured with eye tracking and ad memory was assessed with recognition and recall tests. The results suggest that on average, animation had little or no effect on attention. We did nevertheless observe a strong interaction effect between animation and ad format, which suggests that the effect of animation is conditioned by ad format. Animation has a positive effect on attention to skyscrapers, but a negative one on attention to banners. As to memorization, animation improved recognition effects, but mainly for banners. Surprisingly, consumers could recognize ads without having looked at them, which suggests that online consumers are especially parsimonious in allocating their focal attention and memory resources to irrelevant ads when they are involved in other tasks.

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*Keywords:* Online advertising; Animation; Format; Eye movements; Attention; Memory

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### Introduction

Given the abundant information available on the web, it is important for practitioners and academics to understand how online consumers perceive and memorize online advertising. Consumers are exposed to online ads constantly during active use of online media, whether they are engaged in information search, entertainment, shopping, or exploration. A high number of ads in various formats on a single web page creates advertising clutter; it increases ad avoidance and reduces consumers' memory of online ads (Cho and Cheon 2004; Ha and McCann 2008; McCoy et al. 2007). Online users' attitudes towards different ad formats vary and this affects ad viewing (Burns and Lutz 2006). When assessing online advertising effectiveness, it is therefore vital to investigate how online ad characteristics such as format and animation influence users' attention and memory.

Research on the relative effectiveness of various online ad formats and on how people look at them is still in its infancy (Rayner and Castelhana 2008). The effectiveness of online ads has usually been measured by click-through rates. In the United States click-through rates have declined steadily from 7% in 1996 to approximately .1% in 2008 (Doubleclick 2009). Nevertheless, advertisers invest increasingly in online advertising even if the evidence of its effectiveness is equivocal. As online media revenues have become a dominant earning logic for many companies offering free services but selling media space, these firms try to maximize the number of ads on their sites, thus cluttering the advertisement environment for both advertisers and consumers (Ha and McCann 2008). Hence, online advertisers try to draw attention to their ads by means of a variety of advertising techniques such as animation.

A host of findings suggests that online advertisements have little effect on consumers: people avoid fixating their eyes on online advertisements and forget most ads instantly even if they have fixated them (e.g. Benway and Lane 1998; Burke et al. 2005; Cho and Cheon 2004; Drèze and Husherr 2003; Stenfors, Morén, and Balkenius 2003). As an ad technique, animation has

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proven especially divisive. Positive, neutral and even negative effects of animation on attention and ad memory have been reported; negative effects are typical especially when animation is excessive (e.g. Sundar and Kalyanaraman 2004; Yoo and Kim 2005). Furthermore, the effect of format on attention and memory appears to be almost unexplored in the Internet environment.

This paper examines how animation and format affect online consumers' attention and memory of online ads and seeks to evaluate the effectiveness of various ads. We utilized a real-world web page environment and stimuli to examine these effects. Consumers' attention was measured by eye fixation metrics and the memory effects by recognition and recall tests. Two ad formats, namely, horizontal banners on the top of the webpage and vertical skyscrapers along the right side of webpage were tested both in animated and motionless forms. In addition, we measured the impact of participants' visual short-term memory capacity.

In the following sections we will first describe the theoretical rationale behind our hypotheses and then our experimental design and test procedures. In presenting the results, we will discuss both the main effects of animation and format and their interaction effects separately, as well as the results of controlling for individual differences in memory capacity. Finally, we will discuss the theoretical and managerial contribution of the findings.

## Background Theory and Hypotheses

In advertising literature, attention capture and memorization are the cognitive processes most closely linked to advertising effects. The hierarchy models of advertising assume a positive link between the two processes; higher attention capture leads to better ad memorization. This general hierarchy-of-effects approach is a useful starting point for our discussion on the effects of online ad characteristics on ad effectiveness. We will next discuss how animation and ad format influence attention capture and memorization of ads in the online advertisement context. We seek to determine why it is not sufficient to focus on either of the aforementioned ad characteristics alone: the effectiveness of an online advertisement depends on both its placement and whether animation is used. Moreover, the two characteristics can also interact.

### Attention to Ads

Attention to ads depends on a variety of factors including ad content, ad characteristics, message conveying media (Calder, Malthouse, and Schaedel 2009), advertising clutter, and the congruency of ad content and editorial content of the conveying media (Ha and McCann 2008; Newman, Stem, and Sprott 2004; van Rompay, de Vries, and van Venrooij 2010). In addition, consumers' motivation, involvement and intention to allocate attention to ads is related to their sensorial and cognitive capacity to process information (e.g. Lutz and Huit 2003; McInnis and Jaworski 1989; Petty, Cacioppo, and Schumann 1983). Individual needs and tasks at hand (Vidnyánsky and Sohn 2004), liking of

the ad (MacKenzie, Lutz, and Belch 1986) and the frequency of ad exposure (Chatterjee 2005; Fang, Singh, and Ahluwalia 2007; Zajonc 1968) also affect how ads are perceived.

According to early 20th century researchers, attention refers to sensations. It results in increased awareness of the sensations and greater capacity to remember them later (Pashler 1998). It has been demonstrated that shifts in visual attention and eye movements are related (e.g. Hoffman 1998; Posner 1980). However, it has been argued that our eyes can be fixated on an object or a scene, although our attention is elsewhere. For example, Krugman (1977) presents a simple fourfold classification for looking at TV ads: to look and see, to look and not see, to neither look nor see, and to see without looking. In his taxonomy 'looking' (at) refers to eye fixations and 'seeing' refers to visual attention. At first sight, seeing without looking seems to be an implausible combination. According to Krugman's explanation most of our vision is peripheral which permits us to see without fixating the eyes — seeing without being aware that seeing has occurred. One may criticize this analogy as an oversimplification of how ads are perceived and processed, but it suggests that consumer attention to advertisements may take different forms and vary in quality.

Up to now, studies on visual attention to ads have primarily measured the amount of attention and less the quality of visual attention, the latter being perhaps more difficult to measure (Radach et al. 2003). Conventional advertising hierarchy models, such as the AIDA attention–interest–desire–action model (e.g. Aaker, Batra, and Myers 1992) or the AIETA awareness–interest–evaluation–trial–adaptation model (e.g. Krugman 1977), are based on cognitive information processing and presume that attention is required as a first phase and an antecedent for further information processing that proceeds in a hierarchic order from attention to action (Aaker, Batra, and Myers 1992) or from awareness to buying (Lavidge and Steiner 1961). These models seem to make the underlying assumption that ads either draw attention or are entirely ignored, and that visual attention to advertisements is best secured with salient ad characteristics. By visual salience we refer to image properties such as colour, orientation and motion (e.g. Brockmole and Henderson 2005). Hierarchy-of-effects models are conceptually useful but do not describe how consumers are exposed to advertising (Cho 1999). In addition, the quality of attention – either focal and consciously processed and only “peripherally seen” and pre-attentively processed – affects information processing and memory performance (Brockmole and Henderson 2005; Janiszewski 1993; Matthes, Schemer, and Wirth 2007; Ryu et al. 2007).

The motivation, ability and opportunity of consumers to process advertising also affect the amount and quality of attention allocated to an ad. High motivation and involvement are connected to active and intentional information search and processing whereas in low-involvement circumstances consumers' attention to advertisements can best be captured by the conspicuous visual cues and characteristics of an ad. The Elaboration Likelihood Model (Petty, Cacioppo, and Schumann 1983) explains advertising effects by type of elaboration. Elaboration takes place either through a high-involvement central processing route or a low-involvement, peripheral processing route. The ELM model assumes that these two routes to

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