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-ACHIEVING VISUAL ATTENTION IN PRINT – EVIDENCE FROM NEUROSCIENCE

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Abstract
This paper argues for the importance of using visuals in print; suggests a framework for classifying different visual tactics; and provides evidence from neuroscience showing that we are biased towards deviant and evocative cues for evolutionary reasons.

Introduction

Clutter continues to be one of the biggest issues in advertising. Belch and Belch (2001) pointed out that the number of TV ads has grown by an additional 30% since the 1990s. The same sort of clutter is also seen in the print medium where on average, a consumer magazine contains about 48% ads (and 52% editorial), according to Magazine Publishers of America (cited in Belch and Belch 2001). Furthermore, the more ads, a magazine has, the more likely it is to impact negatively on its circulation and financial returns (Ha and Litman, 1997). The sheer amount of clutter, compounded by ever-rising media costs, puts a premium on the ability of an ad to cut-through and capture our attention. And as Bill Bernbach (1989) said, "If your advertising goes unnoticed, everything else is academic". But how does one achieve cut-through in print given the fact that there is no sound (like radio) or movement (like TV)? In this paper we suggest attention in print can be gained by utilizing certain classes of visual tactics and go on to theorise the reason for its effects may be due to evolutionarily bias.

Importance of the visual component

Of all the components in a print ad, the two most important in capturing our attention are the picture and the headline (Pieters, Rosenberg and Wedel, 1999). However, studies have shown that we tend to be biased toward the picture: (a) people generally spend more time looking at pictures than words (Franzen, 1994), also confirmed by the observation that pictures have the highest level of fixation (Pieters et. al., 2002); (b) in 90% of cases, people tend to look at the visual before the words (Kroeber-Reil, 1990); (c) the more words an ad has, the worse its recognition - both in terms of the 'Noted' and 'Read Most' Starch scores (Vilente, 1973; Franzen 1994, p. 57-59); (d) under time pressure, it is the textual information that tends to suffer the most (Pieters and Warlop, 1999).

Visuals also have memory and processing advantages over words. People tend to remember pictures better than words (Paivio 1971). They also tend to process pictures faster and more holistically than words. For instance, in the same time it takes people to mentally process a picture of average complexity, they can only process about 7-10 words (Franzen 1994). This is because visual elements can be processed in a more gestalt way (Holbrook and Moore, 1981). The holistic property also makes pictures much more effective than words in activating our emotions. Mitchell and Olson (1981) found that the

presence of illustrations in an ad increases the appeal of both the ad and the brand (than just ads with just words). More recently, Heath and Nairn (in press) found that ad recognition, a visual memory cue, is a better predictor of brand favourability compared to ad recall, a verbal memory cue. Finally, the universal nature of visuals has greater currency for international advertising. If the right picture is selected for an ad, it will be universally understood without the need for words (and hence translations) (Dzamic 2001). Thus, it seems logical that one effective way of gaining attention in print ad is to use visuals.

Literature review

The study of attention has a long history in psychology often attributed to William James (1890) as its forefather. He argued that there two main types: Voluntary and involuntary. One can think of voluntary attention as being inner-directed, like when we are deliberately searching for information, controlled by top-down factors like our expectations, knowledge and goals. On the other hand, involuntary attention tends to be a bottom-up process, where the power resides in the nature of the stimuli. This can take the form of a forceful sensorial kind like intensity or suddenness; or of the instinctive and novel kind. In modern advertising, due to clutter, the main interest is that of involuntary attention or what is often dubbed the "orienting reflex" (Pavlov, 1927).

Although there is a growing interest in visuals (e.g., Batra and Scott 2000), there is surprisingly very little research into the studying of visual "orienting reflex" in advertising. Most advertising research with a few exceptions tend to focus on the verbal strategies, or how visuals influence our memory or attitude (e.g., Mitchell and Olson 1981; Heckler and Childers, 1992; Peracchio and Meyers-Levy, 2005). Furthermore, Starch studies do not directly measure attention, but instead ad recognition, which is a memory assessment. They also tend to investigate mechanical factors like picture size, length of the headlines, the presence of nouns, or verbs (e.g., Hendon, 1973; Rossiter, 1981). These are largely empirical, and devoid of theories. Third, and more importantly, none of the Starch studies have examined the nature of visuals and its attention-eliciting power.

If attention is assessed at all, surrogate measures like viewing time, or even self-rated measures tend to be used. For instance, Celsi and Olson (1988) found that the more involved the reader is, the longer their viewing time. Olney, Holbrook and Batra (1991)

found that if the ad content is unique, it will be perceived to be more interesting; and both of these factors increase viewing time independently. Dahl et al (2003) asked students to self-report whether shocking posters are more attention-getting than fearful ads, and found that the former is more effective. Such methods of assessing attention can be problematic since our orientating reflex can be fleeting or even unconscious (see later) suggesting that advertising can be effective without our full conscious attention (e.g., Janiszweski, 1990, 1993; Heath, 2000). Thus being able to assess the 'fleeting nature' of our attention is important. The use of eye scanning technology to capture our visual orientation *in situ* is a step in the right direction (Krober Riel and Barton, 1980). For instance, Wedel and Pieters (2000) found that print ads that have originality qualities tend to draw greater attention (as measured by eye fixation) to the brand and if the ad is also familiar, the draw to the advertised brand will be even greater, leading to better brand memory (Pieters, Warlop and Wedel, 2002). But aside from these methodological issues, we face another challenge - how does one make sense of the plethora of visual cues used to capture our attention? And why should they be effective? One needs to start with a theoretical framework.

A Visual-led Framework of Attention Triggers

Building principally on the original work of Krober Riel (1993), Berlyne (1958), Beiderman et al (1982) and Lang et. al (1993), our framework is shown in table 1 below. The first category of attention-getting tactics refers to stimuli that are visually odd. We call such stimuli 'deviant cues' because they violate our expectations, either due to their inherent property (e.g., size distortion), or their odd relationship with other visual elements in the picture (e.g., misarrangement). When we first encounter such visuals, we tend to be surprised, arousing a sense of curiosity, which encourages further exploration and learning. Such stimuli are primarily cognitive in their effects.

The second category refers to stimuli that quickly trigger our emotions. We call such stimuli, 'evocative cues'. They are cues that immediately arouse a 'deep visceral' reaction (i.e., autonomic arousal) accompanied by feelings of strong like or dislike (i.e., valence effects) from which we have minimal conscious control. These cues can be positive-approach (e.g., sex), or negative-avoid in nature (e.g., snakes). Unlike deviant cues, the identity of these cues is immediately obvious and our reaction swift. Such stimuli are primarily emotional in their effects.

Finally, the third category is simply called 'visual magnifiers'. These tactics serve to amplify the ad itself or the elements within. They are mechanistic in nature (e.g., size or colour).

Deviant Cues	Evocative Cues
Property deviant cues (e.g., size)	Positive-approach cues (e.g., eroticism)
Relational deviant cues (e.g., misarrangement)	Negative-avoid cues (e.g., snakes)

Visual Magnifiers (e.g., size and colour)

Table 1: A visual-led framework of attention triggers

Of the three classes of cues discussed above, perhaps the most interesting are the first two – deviant and evocative cues. The third class, visual magnifiers is better studied (e.g., see Rossiter and Percy, 1997), and will not be dealt with in this paper. We will now explore in greater depth the first two classes; in particular we ask: (i) what evidence do we have to support our argument that such cues trigger an orienting reflex; (ii) why should these visual cues be more effective than others, and finally (iii) the marketing implications & caveats of using such cues?

Supporting Evidence

Since orienting reflex has not been studied in mainstream advertising research as reviewed above, we turn to neuroscience. Four lines of evidence will be cited to suggest why we involuntarily attend to deviant and evocative cues: (i) comparative studies of different species, (ii) unconscious response, (iii) brain wave activations, and the (iv) existence of an underlying vigilance system.

(i) Comparative studies

One line of supporting evidence can be seen in comparative studies. Scientists have found a commonality in orienting response across many animal species. For instance, across many comparative studies, Campbell consistently found two kinds of orienting reaction: (1) a "What is it?" orienting reaction in response to unknown environmental information; and (2) a "Is it dangerous? Or Is it food?" reaction in response to known stimuli, that has

appetitive or aversive qualities (Campbell et al, 1997). This uncannily mirrors our two classes of attention triggers: deviant and evocative cues respectively (see table 1). Interestingly, Campbell et al (1997) also found that the orienting reflex to a novel (or deviant) stimulus is only present in mammals (e.g., not present in lizards and birds), but the emotional orienting reflex is present in wide ranging vertebrate animals. This implies that our emotional brain circuit is phylogenetically older than that which detects deviancy.

(ii) Unconscious response

Another line of evidence comes from human conditioning studies where it is consistently found that ancient conditioned stimuli like snakes, spiders and even angry faces are less likely to be susceptible to extinction compared to neutral stimuli (Ohman, et al, 1974; Ohman, 1986; Dimberg and Ohman, 1996). Our response to such stimuli is so automatic that we are not even conscious of it. Using a masking technique, Ohman and his associates very briefly (33ms) present subjects with emotional faces (e.g., happy or fearful faces) or neutral stimuli (e.g., flower and mushroom). Because the exposure of the stimuli is so brief (masked), most subjects do not report seeing them but did exhibit greater skin conductance response (an unobtrusive measure of anxiety and orientation) to emotional faces compared to neutral stimuli (e.g., flower and mushroom) (Soares and Ohman, 1993a; Soares and Ohman, 1993b; Ohman and Soares, 1994). In a subsequent study, they found that the 'emotional brain centre' (specifically the right amygdala) was simultaneously activated when the masked aversive stimulus was used (Morris, Ohman and Dolan, 1998). Thus, even without full consciousness, evocative stimuli can still evoke a response.

(iii) Brain waves activations

Another line of evidence comes from studying the changes in brainwave when subjects are exposed to various visual stimuli. Neuroscientists have been measuring orienting response covertly by observing changes in brain waves, called event-related potential (ERP). These studies have identified a reliable signature brain wave thought to signal involuntary orienting reflex. Known as the novelty P3 signature, it is consistently activated whenever a novel stimulus is encountered. It is characterised by a positive spike occurring at about 300ms after exposure and is absent if the stimuli is not novel (Courchesne et al, 1975). Furthermore, in a review of 102 studies spanning 35 years, Friedman, Cycowicz and Gaeta

(2001) concluded among other things, that if the novel stimuli is continuously presented, leading to eventual decline in novelty, the attenuation of P3 is also observed.

In addition to deviant cues, activation of P3 is also observed with evocative stimuli. For instance, Radilova et al. (1983, 1984) found that erotic pictures showed larger P3 amplitudes than non-erotic pictures (e.g., flowers, landscapes). Similarly, Johnston, Miller and Burleson (1986) found that female subjects watching sexual pictures of male models exhibited larger P3 compared to pictures of neutral (e.g., ordinary people), pleasant (e.g., babies) or unpleasant (e.g., dermatological) pictures (see also Johnston and Wang, 1991; Mini et. al, 1996). In fact, the larger the P3 amplitude, the greater the recall of the evocative stimuli (r =.53) (Palomba, Angrill and Mini, 1997).

(iv) Our underlying vigilance system

Neuroscientists have recently proposed the existence of a 'vigilant system' in our brain, with the amygdala playing a dominant role in this system (Davis and Whalen, 2001; Whalen, 1998; Holland and Gallagher, 1999). The amygdala is identified as two-pea shaped structures that sit below the cortex and is a part of the 'old brain'. It is well known that the amygdala is closely associated with our emotions, becoming activated whenever we encounter evocative visual stimuli whether it is positive or negative (Hamann, et. al, 1999; 2002; Breiter, et. al, 1996). It is also activated when we encounter novel stimuli, even though these stimuli may be *neutral* in their valence (Wright et. al., 2003; Schwartz et. al. 2003). In humans, when novel stimuli are shown, the characteristic novelty P3 is seen in conjunction with the activation of the amygdala (Halgren, 1992). Finally, after reviewing over 290 papers which cover neuroanatomy, animal conditioning studies, and human neuro-imaging studies, Davis and Whalen (2001) offered the strongest evidence yet for the vigilance hypothesis:

(i) Lesion or damage to the amygdala area consistently results in attenuation of response related to attention and generalised arousal (e.g., galvanic skin response, fear-related response - vocalisation and freezing, and avoidance of shock) ;

(ii) Changes in learning contingencies result in higher amygdala activation; (e.g., like the use of variable or partial reinforcement, or the sudden absence of an expected stimuli).

Why should this be so? A Survival-Adaptive hypothesis

Why should such cues involuntarily orient us? Our hypothesis is that our brains have been pre-wired to be differentially sensitive to these cues because they carry important information. For instance, due to its novelty, deviant cues signals that something is different. This allows us to learn (and adapt) to the ever changing environment. Therefore our ability to first detect changes or differences is an important survival skill. On the other hand, evocative cues through their emotional content (i.e., arousal and valence) signal whether something is 'friend or foe', and hence to approach or avoid. Thus our ability to appropriately activate the two basic motivational systems is also an important survival faculty.

However, invoking an evolutionary argument is fraught with problems since one can never prove it. Following the guidelines of Tooby and Cosmides (1990), we offer the following arguments: First, we assume that our ancestors also suffer from limited processing capacity, which means that some cues have to be given more attention than others. Second, as seen in our review above, we tend to orient consistently (and even unconsciously) to such cues. Third, the existence of neural substrates helps explain why we tend to orient to such cues. This is a powerful support for our evolutionary hypothesis because it implies an underlying organic process that is invariant (seen across many species).

Marketing implications & caveats

So what does all this mean for advertising? The implications and caveats are as follows:
First, if deviant and evocative visual cues elicit our attention involuntarily, then advertisers should be encouraged to adopt such tactics *whenever appropriate*. If it is not appropriate, the triggering of our attention (involuntarily) may lead to a boomerang effect (i.e., negative brand attitude). Such tactics may not be appropriate for conservative brands that only use 'straight' pictures; or high involvement goods that require verbal information to reduce perceived risk. Second, it is conceivable that a visual that is both deviant and evocative is likely to be most effective. This should lead to better ad memory though not necessarily better *brand* memory. This is because the picture of the ad is likely to capture disproportionate amount of our attention. Thus to be effective, the brand (and its message) must be somehow visually incorporated into the deviant or evocative

nature of the picture, preferably in a unique (and consistent) way. Finally, the power of these visual tactics may be moderated by different conditions, including individual differences like the ‘Need for Cognition’ (Cacioppo et al, 1984) for deviant cues; and ‘Affect Intensity’ (Larsen and Deiner, 1987) for evocative ones.

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