

# The Impact of Content and Design Elements on Banner Advertising Click-through Rates

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This study investigates the impact of content and design elements on the click-through rates of banner advertisements using data from 8,725 real banner advertisements. It is one of the first empirical studies to examine banner advertising effectiveness (measured by click-through rates) and also one of the first to examine the differences between business-to-business (B2B) and business-to-consumer (B2C) banner advertisements.

Content elements examined include the use of incentives and emotional appeals. Design elements examined include the use of interactivity, color, and animation. Results suggest that content and design elements do not work the same way for B2B and B2C banner advertisements.

In 1994, the now ubiquitous banner advertisement was first introduced. In the eight years since, the internet advertising industry has exploded. According to the Interactive Advertising Bureau (IAB: [www.iab.net](http://www.iab.net)), internet advertising in 2001 was approximately a \$7.2 billion industry in the United States alone. About 35 percent of that was accounted for by banner advertisements (Interactive Advertising Bureau, 2002).

Evidence about the effectiveness of this advertising medium has come mainly from industry reports. Five recent reports conclude that internet advertisements build brands (i.e., increase advertisement awareness, brand awareness, brand image, or intent to purchase). These studies suggest that size, use of interactive elements (such as flash or DHTML), and advertisement position (such as interstitial) increase branding (Interactive Advertising Bureau, 2002).

Industry beliefs also suggest that creative execution impacts branding. Advertisements that perform best reveal the brand early on. Similarly, lighter backgrounds, high contrast, and dynamic messages improve branding. Another study concludes that limiting clutter, using larger brand logos, and depicting human faces improves brand-

ing. Keeping the message simple and straightforward helps advertising performance (Briggs, 2001b).

This study, based on a large sample of real data from an online advertising company, comprehensively explores the effectiveness of internet banner advertising. The objectives of this research are twofold: to define what constitutes an effective banner advertisement and to analyze if there are differences in what constitutes effectiveness across business-to-business (B2B) versus business-to-consumer (B2C) banner advertisements.

While a lot of resources are being spent on internet banner advertising, there has been little formal empirical research that provides guidelines for effective banner advertising. Most industry reports are based on market polls or experiments and have examined the effectiveness of banner advertisements on branding. Market polls ask respondents for their opinions about banner advertising effectiveness and are qualitative in nature. In experiments, groups of consumers are shown an advertisement and their branding scores (or other dependent measures) are examined before and after the advertisement is shown. Any changes in branding scores compared to a control group are attributed to the banner advertisement (Inter-

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active Advertising Bureau, 2002). Most of this research, however, has examined the effectiveness of only a few advertisements (ranging from 1 to 45), and often advertisements of well-established brands (Li and Bukovac, 1999). Thus the results may not be generalizable. Further, subjective inferences are made to determine what makes certain advertisements more effective (Briggs, 2001b; Briggs, Sullivan, and Webster, 2001a, 2001b, 2001c). Consumers need to agree to participate in these research studies, and this can bias the results. In addition, while branding is important, click-through is the most commonly used measure of success in the advertising industry. Market polls and experiments often do not measure click-through rates (CTRs).

This study overcomes some of the limitations of previous research. It uses a large sample of real banner advertisements to examine what constitutes the effectiveness of banner advertisements. We used 10,000 actual advertisements placed by an internet advertising company on different websites for its customers over a period of time. The click rate used in the analysis is the actual click rate recorded by the advertising company for each of the advertisements. Further, the consumers were not aware that they were involved in an advertising effectiveness study. Using judges to code the advertisements with respect to their characteristics, we empirically examine what banner advertising characteristics impact the effectiveness of B2B versus B2C advertisements.

This research makes several contributions to both practice and theory. First, it is one of the first empirical studies to examine what constitutes banner advertising effectiveness (measured by CTRs). Second, it is based on an extremely large sample of real banner advertisements, making the results extremely reliable. Third, it is one of the first to examine

## **... people tend to process information differently depending on their level of involvement with the message.**

the differences between B2B and B2C banner advertisements. Very few studies have focused on comparing B2B and B2C advertising (Lambert, Morris, and Pitt, 1995). This research will help B2B and B2C media planners use their online dollars more effectively.

### **DEPENDENT VARIABLE: CLICK-THROUGH RATE (CTR)**

While there is no industry standard for measuring the effectiveness of a banner advertisement, one specific metric that has been used extensively is CTR. According to a recent online advertisement measurement study (PriceWaterHouseCoopers, 2001), a click is a "user-initiated action of clicking on an ad element, causing a redirect to another web location" (p. 17). Clicks and advertisement impressions, i.e., number of times an advertisement is served to a user's browser, are the top two metrics used for advertisement delivery reporting and audience measurement. CTR is the ratio of number of times an advertisement is clicked to the number of advertisement impressions.

### **The role of advertising context in banner advertising effectiveness**

It is well established in the literature that, depending on certain environmental, personal, or contextual characteristics, people utilize different information processing approaches (Meyers-Levy and Malaviya, 1999; Petty and Cacioppo, 1986). The primary driver of information processing strategy is involvement, resulting in what is known as the dual-process model of information processing. The basic tenet to this model, also known as the Elaboration

Likelihood Model, is that people tend to process information differently depending on their level of involvement with the message. For a high-involvement situation, people tend to use "central route" processing, meaning that they make a cognitive effort to evaluate statements or attend to claims or other message stimuli. It has been shown that during central route processing, nonessential stimuli, such as colors or sound, are not processed very heavily. Because these "secondary" elements do not convey any specific information, they merely exist as a background to the content that is most important, namely the more cognitive elements of the advertisement, such as incentives.

On the other hand, in situations of low involvement, people tend to use "peripheral route" processing, meaning that they are engaged in more subconscious processing where they simply do not make an effort to attend to any specific message elements. Affective components take the lead in this situation, and attitude change is effected through the use of peripheral cues, such as color, animation, or music.

To apply this model to this research, we utilized the context of the banner advertisements (B2B versus B2C) as a moderating variable. It is a common belief that business purchase decisions are more likely to be high involvement compared to consumer purchase decisions. Products purchased are often customized, are seldom impulse purchases, and are usually the result of group decision making. The purchase cycles are also longer, and purchase scales are considerably larger. Because involvement drives the information process-

ing task, we suggest that viewers will process banner advertisements differently based upon the advertisement context. B2B advertisements should be more cognitive in nature, because in high-involvement situations, people tend to use central route processing where cognitions are used heavily. B2C advertisements should be more affective in nature, because low-involvement situations are more conducive to peripheral route information processing.

**INDEPENDENT VARIABLES: MESSAGE CONTENT AND ADVERTISEMENT DESIGN**

To determine the advertisement characteristics that may have an impact on CTR in these two contexts, we examined advertising research in traditional media such as print, broadcast, and billboards (Bhargava, Donthu, and Caron, 1994; Henssens and Weitz, 1980; Lohtia, Johnston, and Aab, 1995; Stewart and Furse, 1986; Wells, Burnett, and Moriarty, 2000). This research suggests that both the content and design of banner advertisements should impact click-through. Within each of these types of variables, we selected variables to represent both cognitive and affective components. Thus, we identified banner advertisement characteristics for each of four groups: cognitive content, affective content, cognitive design, and affective design (see Table 1).

**Content elements**

Content elements include message, appeal type, and offers made and can in-

volve the viewer at a cognitive or affective level. Message content is often used to deliver a message making some claim and utilizing some appeal type. We look at two message content characteristics, one cognitive and one affective. We chose the use of incentives to measure cognitive message elements. It is thought that while banner advertisements are typically more useful for improving brand attitude or recognition, action can be generated if the advertisement offers an incentive for action (Krishnamurthy, 2000). For example, a banner advertisement could offer a dollars-off coupon in return for clicking on a banner advertisement. According to a survey conducted by Greenfield Online Inc. (Mullaney, 1999), most web surfers are looking for incentives to read an advertisement before they click to another page. For example, 66 percent look for an advertisement containing a free offer.

For the affective message element, we measured the use of emotional appeals. A popular method of gaining attention and generating action from any type of advertising is through the use of an emotional appeal (Holbrook and Batra, 1987). Emotional appeals can take the form of fear, love, happiness, etc. By eliciting an emotional response from an advertisement, we expect greater CTR through increased involvement with the advertisement. Research suggests that, in general, consumer advertisements are less factual and more emotional in appeal (Lambert, Morris, and Pitt, 1995).

**Design elements**

To assess the design characteristics of a banner advertisement, we selected three criteria: interactivity, color, and animation. While there may be other design elements that could be considered, these three seem to be emerging in the industry as key factors to banner advertising success (Krishnamurthy, 2000).

As with the content elements, design elements can be used to elicit either a cognitive or affective response. Interactive elements of a banner advertisement attempt to elicit a cognitive response by allowing the viewer to submit searches, enter forms, or simply click to visit the advertiser's website. By allowing interactivity, the advertiser is attempting to increase viewer involvement by creating two-way communication, instead of the usual one-way communication that most traditional types of advertising accomplish. There is evidence that interactivity of banner advertisements has a substantial impact on CTR (Mand, 1998). However, superfluous interactivity can be distracting and should be avoided (Interactive Advertising Bureau, 2001).

Affective components are intended to elicit some type of emotional or feeling response, usually invisible to the viewer. Typical ways that advertisements can be used to elicit affective response are through the use of color and animation. The amount of color used in advertising has been shown to impact advertising effectiveness in traditional media (Gronhaug, Kvitastein, and Gronmo, 1991). Past research suggests that there may not be a direct positive relation between color and effectiveness. Gronhaug, Kvitastein, and Gronmo (1991) found that low levels of color increased effect, while adding more colors beyond that had no effect at all. This suggests that there may be an optimum level of color in an advertisement. Perhaps too much color detracts from the message. According to a survey

**TABLE 1**  
Cognitive and Affective Content and Design Variables

Variables	Cognitive	Affective
Message content	Incentives	Emotional appeal
Advertisement design	Interactivity	Color, Animation

done by Greenfield Online Inc. (Mullaney, 1999), bright colors in web advertising were of interest to few respondents. However, DoubleClick, an Internet advertising agency, recommends the use of bright colors in banner advertisements ([http://www.doubleclick.com:8080/learning\\_center/research\\_findings/effectiveness.htm](http://www.doubleclick.com:8080/learning_center/research_findings/effectiveness.htm)).

The final independent variable is animation. The first banner advertisements were simply static images containing advertising content, much akin to print advertisements. However, new technologies such as plug-ins, java script, and streaming media have transformed banners in remarkable ways (Wells, Burnett, and Moriarty, 2000, p. 277). Many advertisers have begun to implement loop-animated banners to deliver a progressive and sequential image. It is well known that television is one of the most intrusive, involving media forms because of its ability to use moving images. When banners use animation, they also take on the character of television advertisements, and this may suggest that animated banner advertisements will attract more attention and hence be clicked more (Wegert, 2002). Studies of side-by-side performance of advertisements for different companies conducted by ACNielsen suggest that animation increases click rate (Briggs, 2001b).

Based on an experiment, Li and Bukovac (1999) illustrate that animation increases response times and recall of banner advertisements. They use distinctiveness theory to suggest that animated banner advertisements are distinctive from static ones and are more likely to attract attention. Li and Bukovac state that banner advertisements are likely to "... create unique memory traces" (p. 342) and result in better recall.

Looking at our five independent variables (Table 1), incentives and interactivity deal more directly with central route processing, i.e., both of these variables deal with

active, cognitive thought processes. We suggest that B2B advertisements are viewed more often in high-involvement situations and hence are processed through more central route processing. The other three independent variables (emotional appeal, color, and animation) are usually not actively processed and can be considered peripheral cues. Therefore, emotional appeals, color, and animation are likely to be used more in low-involvement situations. We have suggested that B2C advertisements are more likely to be viewed in low-involvement situations. Based on the above discussion, we present the following hypotheses:

- H1a: When the banner advertising context is B2B, the relation between incentives and CTR is stronger than when the banner advertising context is B2C.
- H1b: When the banner advertising context is B2B, the relation between interactivity and CTR is stronger than when the banner advertising context is B2C.
- H2a: When the banner advertising context is B2B, the relation between use of emotional appeals and CTR is weaker than when the advertising context is B2C.
- H2b: When the banner advertising context is B2B, the relation between color level and CTR is weaker than when the advertising context is B2C.
- H2c: When the banner advertising context is B2B, the relation between animation and CTR is weaker than when the advertising context is B2C.

## METHODOLOGY

The empirical study was conducted at the individual banner advertisement level. A

large online advertising company provided us with 10,000 banner advertisements that were randomly selected out of an inventory of real world banner advertisements that were online in the previous months. Five independent judges remotely coded these advertisements. The judges were marketing doctoral candidates that completed a joint training session where they were familiarized with the coding scheme. An online coding tool was developed, and each coder had a unique password to the website where the banners could be viewed and coded.

We measured incentives by evaluating the banner advertisements for the presence or absence of incentives to click. The literature has conceptualized emotion in different ways (Batra and Ray, 1986; Chandy, Tellis, Macinnis, and Thaivanich, 2001), either treating each emotion as a construct itself or treating all emotions as a scale from negative through neutral to positive (Bagozzi and Moore, 1994). In this research, we followed the latter route. We assessed banner advertisements' use of emotional appeals by capturing a range of positive and negative emotions. Some advertisements used no emotional appeal at all. Because less than one percent of the advertisements used negative emotions, we defined emotion as a binary variable to capture the use of emotions or the lack thereof.

We measured interactivity by evaluating the banner advertisements for the presence or absence of interactive elements. To assess the impact of color on the level of banner advertising effectiveness, we evaluated the impact of the number of colors present. Then we collapsed that scale to low, medium, and high color. We conceptualized animation to be either present or not, and we measured it on a two-point scale.

The judges were instructed to check boxes for the banner advertisement's appeal, num-

**TABLE 2****Mean Usage of Content and Design Elements in Banner Advertisements**

	Incentives	Interactivity	Emotional Appeals	Low Color	Moderate Color	High Color	Animation
B2B advertisements	35%	36%	55%	4%	42%	53%	29%
B2C advertisements	32%	37%	54%	5%	37%	58%	27%

ber of colors, inclusion of interactive elements, animation, and direct incentives to click. They also were instructed to code the advertisements' context as either B2B or B2C. To ascertain interjudge reliability, all judges coded a subsample of 100 randomly selected advertisements. For all independent variables, we estimated the interjudge reliability coefficient using Rust and Cooil's (1994) proportional reduction in loss (PRL) reliability measure, which can be evaluated using the same criteria as evaluating Cronbach's alpha—i.e., 0.70 is acceptable, 0.90 is desirable. All reliabilities were high and in the desirable range (mean = 0.94).

The actual CTR for each banner advertisement was provided by the online advertising firm; however, not all advertisements had click data. Those advertisements without click data were eliminated from the data, leaving a total of 7,421 B2C advertisements and 1,304 B2B advertisements, for a total of 8,725 advertisements. The banner advertisements included in the sample represented a wide variety of products and services.

Analysis of variance (ANOVA) was used to test the moderating effect of advertisement context. The results of this analysis are discussed in the following section.

**RESULTS**

Table 2 shows the usage of the various elements in B2B and B2C banner advertisements. It appears that both kinds of advertisements use all the elements. No specific content or design strategy seems

to be dominating in either type of advertisements. The ANOVA (results in Table 3) confirms that for all the relationships the moderating effect of advertisement context is significant at the 0.01 level.

To support our hypotheses that advertisement context moderates these relationships, we need to see a significant difference in CTR between the interaction term measures. Consistent with Hypothesis H1a, the results show that for B2B banner advertisements, the relationship between incentives and CTR was stronger than for B2C advertisements. Figure 1(A) demonstrates the dramatic impact of advertisement context on this relationship. It also shows that, while the presence of incentives does not influence the CTR of B2C banner advertisements, the presence of incentives hurts B2B banner advertise-

ment CTR. Hypothesis H1b suggests that for B2B advertisements, the relationship between interactivity and CTR is stronger than for B2C advertisements. This moderating role of advertisement context as illustrated in Figure 1(B) is supported by ANOVA. It appears that interactivity actually lowers CTR; however, in B2C banner advertisements, the losses are far less than those for B2B banner advertisements.

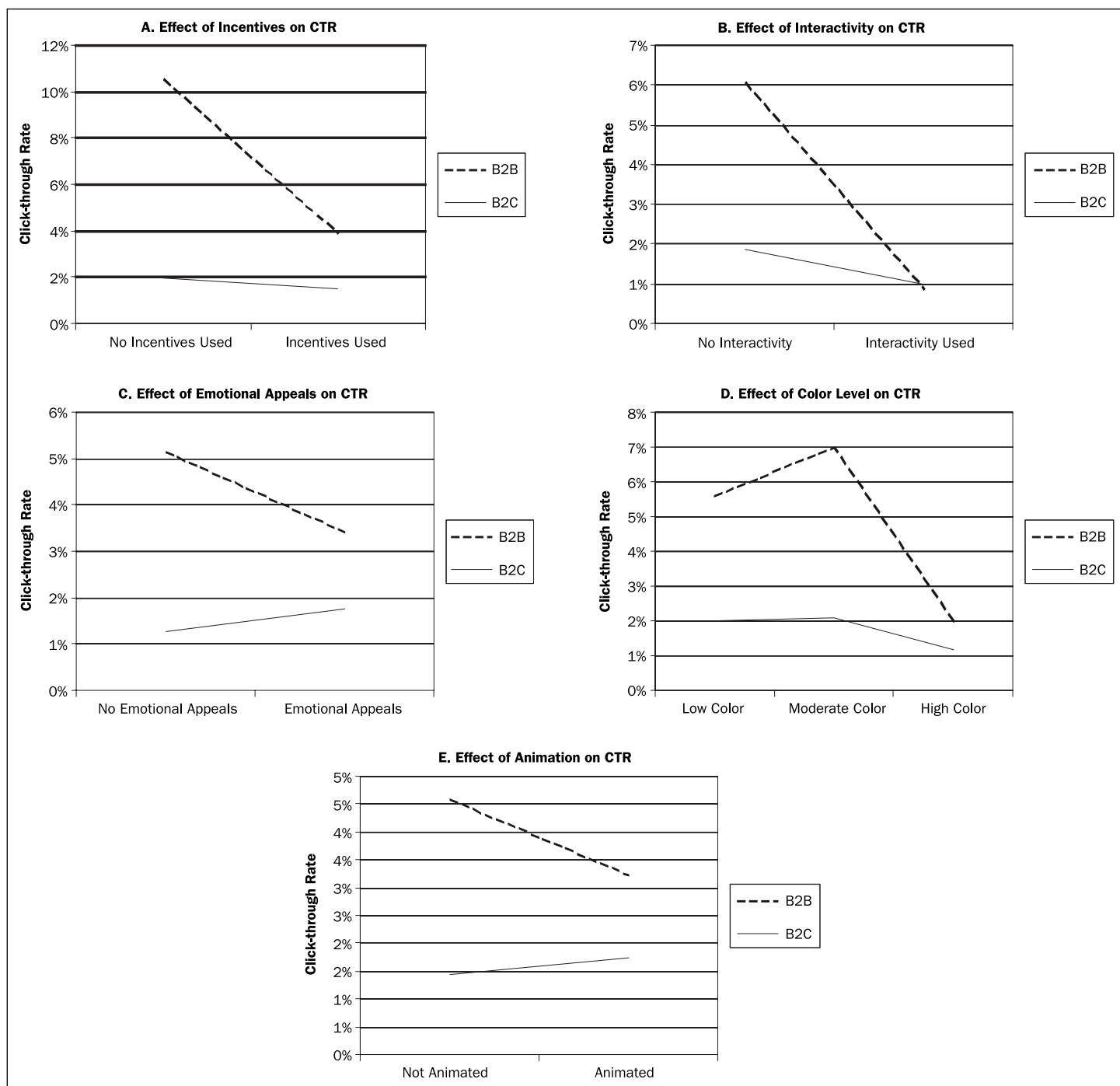
The second set of hypotheses dealt with design elements, namely the use of emotional appeals, color, and animation. Hypothesis H2a suggested that the relationship between the use of emotional appeals and CTR is stronger for B2C advertisements than B2B advertisements. Figure 1(C) shows that advertisement context plays a substantial role in the effect of emotional appeal use. For B2B banner advertisements, emotional

**TABLE 3****ANOVA for Testing Moderating Effect of Advertisement Context on the Impact of Content and Design Elements on CTR**

Source	F
Incentives × advertisement context	11.196*
Interactivity × advertisement context	33.286*
Emotional appeal × advertisement context	19.689*
Color level × advertisement context	24.642*
Animation × advertisement context	7.524*

\*Significant at the .01 level.





**Figure 1** Interaction Effects

appeals decrease CTR; however, for B2C banner advertisements, there is an increase in CTR when emotional appeals are used. According to Hypothesis H2b, color would have a greater impact on CTR for B2C ad-

vertisements than for B2B advertisements. The results, however, show (see Figure 1(D) and Table 3 results) that color has a strong impact for both B2B and B2C banner advertisements. For both B2B and B2C banner

advertisements, a medium level of color produces the highest CTR. As hypothesized in H2c, the interaction effect between context and animation is significant and is illustrated in Figure 1(E). We see that animation

lowers CTR in B2B advertisements, but increases CTR in B2C advertisements.

## DISCUSSION

After analyzing the CTRs of a large sample of banner advertisements, the main conclusions are:

1. Contrary to our expectation, the presence of incentives and interactivity lowered the CTR of banner advertisements. This was especially true for B2B banner advertisements than B2C banner advertisements.
2. As expected, the presence of emotion and animation increased the CTR for B2C banner advertisements and decreased the CTR for B2B banner advertisements.
3. Medium level of color was better than low or high levels of color for B2B and B2C banner advertisements.
4. B2B banner advertisements had higher CTR than B2C banner advertisements.

It is possible that the presence of incentives and interactivity detracts from the content of B2B advertisements because their presence lowered CTR considerably. Given that B2B purchases are often customized and high in dollar value, incentives that are tailored to specific customers and their needs may be more appropriate. Future research should examine if offering tailored incentives for B2B customers increases click rate.

The above information is very useful for web designers and banner advertisement producers. If a B2B banner advertisement aims for high CTR, then it should not use incentives, interactivity, emotion, and animation. These things are best left for B2C banner advertisements. For both B2B and B2C banner advertisements, the use of too much color is not recommended, but a medium level of color is

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preferred over a low level of color, especially for B2B banner advertisements. For B2C banner advertisements, the use of emotions and animation is especially recommended. It will be interesting to determine what types of emotional appeals and animation techniques are more effective for B2C advertisements.

The above findings and recommendations are not obvious and that is where the main contribution of this research lies. Content and design elements do not work the same way for B2B and B2C banner advertisements. Additionally, they do not work the same way as advertisements in traditional media. Given that the hypotheses were developed from literature based largely upon traditional advertising, it is obvious that in many cases, online banner advertising does not operate in the same way as traditional advertising does. One possible reason for this is the lack of media planning in the online advertising industry. A certain level of sophistication in traditional media planning has been achieved to date. That is to say it is likely that advertisements in traditional media have the benefit of proper placement and timing through the use of highly developed media planning models. By and large, banner advertisements are still placed randomly on websites. Characteristics of the viewer and the website should be incorporated in determining where to place banner advertisements.

Our research was based on the reasoning that in general, B2B purchase decisions are more likely to be high involvement compared to B2C purchase decisions. How-

ever, we need to recognize that not all B2B purchase decisions are high involvement and not all B2C purchase decisions are low involvement. In future research, it may be useful to categorize the advertisement context into four categories: B2B high involvement, B2B low involvement, B2C high involvement, and B2C low involvement, and then examine the impact of advertisement content and design variables on CTR in these four contexts.

Future empirical studies should look at other measures of banner advertising effectiveness such as branding. Industry reports have shown that banner advertisements can impact these metrics favorably and that click-through may not always be an appropriate measure of the effectiveness of internet advertisements (Briggs, 2001a). However, given that CTR was higher for B2B banner advertisements, it is possible that CTR is a more appropriate measure of effectiveness for B2B advertisements than B2C advertisements. In this study, we only looked at five independent variables. Other content and design elements need to be investigated. It will be interesting to see how the message content and advertisement design variables influence other dependent variables. While this study is based on an extremely large sample of banner advertisements and should be generalizable, the impact of content and design elements on different types of internet advertisements should be examined.

Future studies may investigate the effectiveness of banner advertisements using experiments. Unlike experiments, our

methodology did not allow us to control for all elements. Future research should investigate the relationship between banner advertising effectiveness and the websites where they are placed. Such efforts will have implications for banner advertising media planning. **JAR**

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