

Examining the Effects of Traditional Advertising on Online Search Behavior

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Abstract

Examining the Effects of Traditional Advertising on Online Search Behavior

Nectarios Economakis

Cross-channel advertising has grown tremendously in recent years as a means to better reach consumers. Television and the internet as well as other channels are used in conjunction to market products. This study attempts to determine the effects of television advertising and its impact on consumer search behavior. More specifically, how search behavior is affected by exposure to television advertising. Actual data over a period of 78 weeks from a large Canadian telecommunications company is employed. The analysis examines how advertising exposure and expenditure impacts search behavior for the company's brand.

The study supports the hypothesis that traditional advertising does have a short term impact on online search behavior for a particular brand. A lift in brand queries was noted in relation to advertising exposure and spending albeit for a short time period. The findings suggest that the current theory on advertising effectiveness needs to be revised to include online effects more specifically in relation to consumer's search habits online. Marketers that wish to study these effects must examine these effects over time and using time series analysis. Finally, marketers must be cognizant of the synergistic effects on online behavior and must plan their media campaigns accordingly. The link between traditional advertising and online search behavior merits further research.

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Examining the Effects of Traditional Advertising on Online Search Behavior

Chapter 1 - Introduction

Search engines have changed the way people look for information. Consumers head to search engines as the first place to find information on products ([Appendix 1](#)). The tremendous growth of companies like Google and Yahoo can be attributed to the change in the way consumers seek information using new technology. The effect on advertising has been quite apparent. Internet advertising is growing rapidly and is taking budget away from more traditional channels ([Appendix 2](#)). However, one area that is often overlooked in this discussion is how traditional media channels affect the use of new media. The internet does not exist in a bubble and discussion around its expansion should not neglect to mention what the role other channels play. The focus of this study is to examine how advertising in traditional channels affects consumer behavior in new channels; more specifically, how television advertising affects online search behavior for a company's brand.

The hypothesis we wish to test is that an increase in advertising causes consumers to more pro-actively search for information online for the company's brand. By examining search engine queries, we can then correlate an increase in user searches to an increase in media exposure

Current State of Practice

Marketers have not fully adopted an integrated marketing approach when deciding upon their media mix. Paid listings using search engines is often not the first element of the media

mix. The main broadcast channels still garner the lion's share of advertising revenue (Appendix 2). However, the tide has turned and many companies have started to allocate a larger portion to search engine marketing (Broderick 2007). The main challenge for advertisers is to integrate search into their traditional advertising campaign. Since this new channel has only been in existence for less than ten years, a clear methodology has not yet emerged to understand the synergies the various channels have on each other. Few advertisers right now are examining results from all their advertising channels in relation to their search engine marketing efforts. One of the goals of the proposed testing methodology will be to test for effects on consumer behavior after exposure to mass advertising channels such as television and radio; the behavior in question is their online search habits.

Relevance of chosen topic

Consumer media behavior is rapidly changing. The effectiveness of traditional advertising channels can now be put into question. In March 2009, there were 3.18 billion searches conducted by Canadians across all search engines, an average of 131 searches per searcher per month (comScore Media Metrix, April 2009). Canadians use search as an everyday tool and marketers must better seek to understand its impact on their brand.

Employing both digital and traditional advertising channels will improve overall advertising effectiveness (Naik, Raman 2003). Prior research has shown that the use of multiple channels in advertising increases brand recall and attitude towards the brand. Our study is relevant for marketers today since advertisers have more channels at their disposal.

The study is also very relevant since search behavior has rapidly shifted and its effects are not well understood. The importance of this topic cannot be understated. Consumers are more than ever using digital platforms to search for product information. Marketers must be fully aware of not only the tool's potential but also how to employ these channels. Consumers using search engines to look for information are in active mindset; they are looking for products and services that they are interested in. A marketer can be present on search engines and will not be interrupting the consumer's experience; they will be presenting relevant information that might help the consumer buy their products.

Chapter 2 – Literature Review

Previous academic literature on synergies between online search behavior and traditional advertising channels is fairly limited. This section will attempt to understand what previous models have been employed to understand synergistic effects from advertising.

Since there are no prior studies that examined specifically several advertising channels' effect on consumer online search behavior, we will first examine several key constructs. The area of television advertising effectiveness in relation to direct response variables will be examined. This theory lies at the heart of the study; there is a need to understand what the key variables behind direct response television are. Next, we will turn our attention to online advertising and search marketing in particular. The efficacy of this tool will be examined.

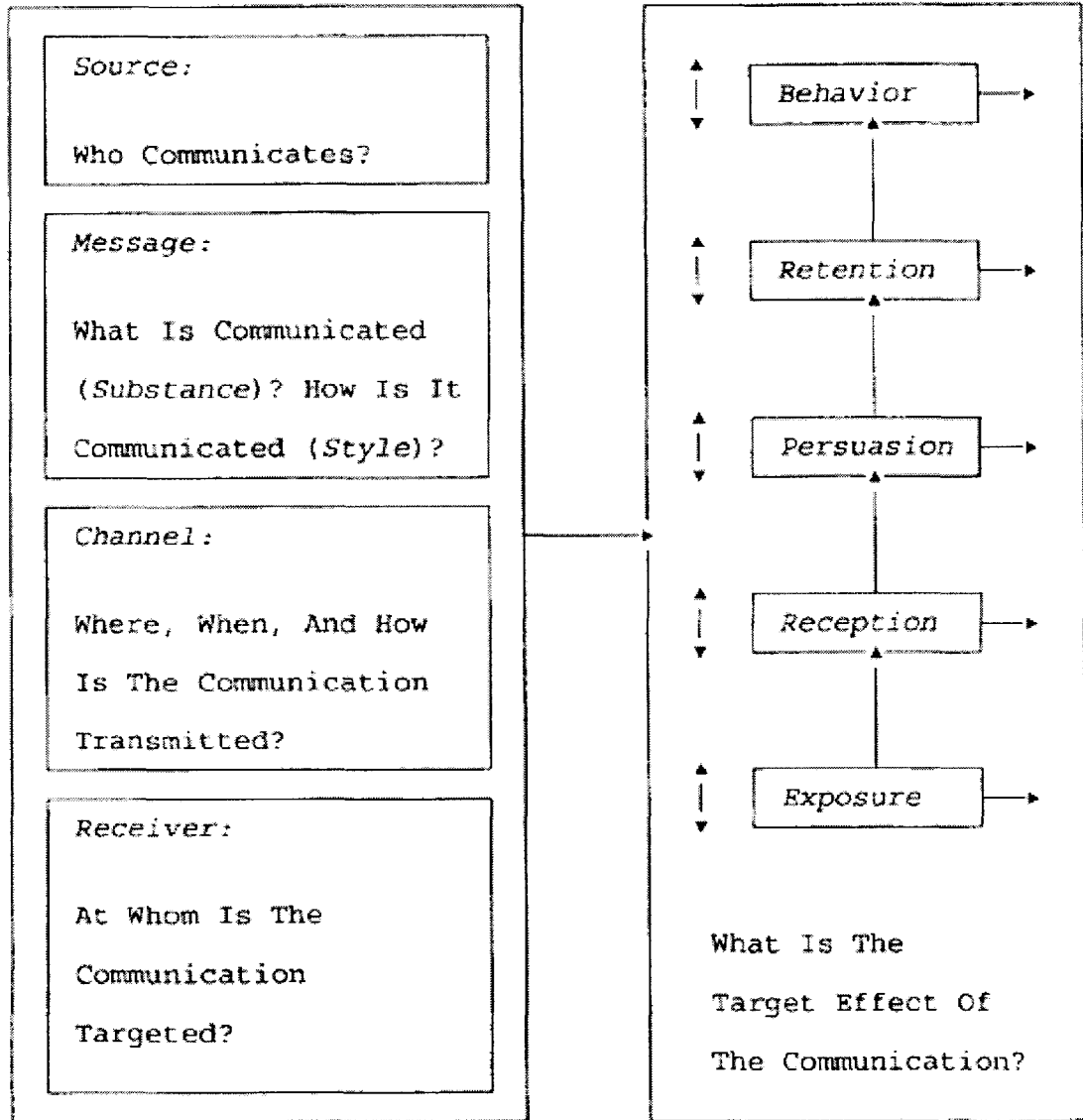
Furthermore, the issue of interactivity will be examined. The notion of interactivity is crucial to understanding the effectiveness of online advertising. Next, we will inspect the issue of cross-channel marketing and how synergistic effects occur. This is a key section of our study since it will help us understand prior academic research and thus build our theories on existing findings

Definition of Key Concepts

We will first examine several key definitions in order to better understand the nature of the themes studied. A first construct we will look is *advertising effectiveness*. Scholten (1999) investigates the information processing model of advertising effectiveness.

A proposed definition of advertising effectiveness is: the relationship between advertising expenditure and brand sales, the affect of demand by establishing a hierarchy of intermediate

effects in its audience. Scholten examines three models of advertising effectiveness (the hierarchy of effects paradigm, elaboration-likelihood model and the information processing model). Scholten proposes a model of the revised information processing model (Appendix 3).



Revised Information Processing Model (Scholten 1999)

The author states that this model provides a general framework of advertising effectiveness since: it captures the four major classes of antecedents of advertising effects, identifies five major classes of advertising effects, conceives advertising effectiveness as a sequence of responses, conditions the effect of an advertising treatment on other advertising treatments and on the marketing context in which the advertising treatments are implemented. More concisely, the model incorporates source factors, message factors, receiver factors, channel factors and destination factors

One particular area of interest for our study is the progression from exposure to behavior. Consumers exposed to an advertisement can be involved with the message or not, the area that is of interest to our study is the link between consumers that are exposed and their resulting behavior on search engines.

An important construct that is also examined is *Interactivity*. This notion is important since we will examine advertising's impact on the online consumer behavior. Liu and Shrum (2002) propose that interactivity is the degree to which two or more communication parties can act on each other, on the communication medium, and on the messages and the degree to which such influences are synchronized. This notion is important to understand on the basis of our current study. The impact of several advertising channels on consumer search behavior is an interactive one. Consumers look for information online after having been exposed to offline and online messages. The advertiser can reciprocate online by ensuring that its message is reinforced on the search results page.

Television Advertising Effectiveness

Understanding how television advertising affects consumer behavior is an important aspect of the proposed research model. Television advertising is the key antecedent to behavioral change in our construct. Television advertising lies at the exposure level of advertising effectiveness. To elicit a behavioral change, exposure to television advertising and its impact must be understood. We will examine some key research articles in this area.

Lodish et al (1995) examined how effective advertising was in relation to sales in the consumer packaged goods category. The authors identify four broad explanatory factors: 1) brand and category conditions, 2) business strategies objectives, 3) media usage and 4) copy related measures. The dependent variable that was examined was sales. They examined new products versus existing products since the role of advertising in each category is different.

The results indicate that it is easier for less well established brands and smaller brands than well established brands to effect a change with increased weight (in advertising). The study calls into question the fact that there is an increased advertising response function for an established brand. Finally, the authors find a negative relationship with increased ad weight and sales volume changes. This article establishes television advertising's credibility for marketers. It has shown to have an effect on sales for established and non-established brands. Therefore in the discussion of cross-channel strategies, we will be able to suggest the employment of television advertising as a legitimate channel for behaviour change. The target company used in our study is an established brand and thus should be harder to effect a change with increased advertising exposure.

Tellis et al (2000) inspect relationships of ad effectiveness in the case of direct television advertising. Direct television is being employed more and more as a marketing tool. Direct television calls users to take specific actions.

The authors state that previous research has shown that the effects of television advertising on sales are significantly greater than zero but vary by market and product characteristics. The repetition effects of advertising can be classified into three broad categories: current effect on behaviour, carryover effect on behaviour and non-behavioural effect on attitude and memory. The authors want to answer the question: which ad works where, when and for how long. The study focuses on television advertising by a firm that provides a referral service for consumers seeking a medical service. A toll free number was advertised. The customer service representatives that answered customer phone calls made recommendations and referred the callers to suitable service providers. Contact between service providers and customers were called referrals. The hypothesis the authors tested is that advertising is going to have a clear, positive effect on referrals.

The results of the analysis suggest that consumers did not respond immediately to the ad. The referrals vary by time of day and decline in the evening. The peak usually occurs during day time advertising. Daytime advertising decay follows an exponential decay pattern, whereas morning advertising decay follows an inverted U-shape pattern. Finally, advertising response is similar across markets but stronger in larger markets. The results indicate that consumers did respond in this direct response model and carried out the appropriate action.

Danaher and Green (1997) also scrutinize the impact factors that influence the effectiveness of direct response television advertising. Their definition of direct response

television advertising (DRTV) is: DRTV incorporates a response mechanism, usually via a toll-free phone number, embedded within a conventional television advertisement. The measures of success typically of DRTV campaigns are sales per ad, responses per ad and responses per rating point. The authors wished to examine the factors that make DRTV advertising effective. The data collected comprised over 700 advertising spots across 12 DRTV campaigns. Phone responses were collected for each spot and the television advertising was based in New Zealand.

Appendix 4 shows the characteristics of the direct response television advertisements. The results of the study indicated that Sunday and Monday have significantly higher response rates. As reach of the population goes up, the number of responses goes down. Day parting was found to be the most important factor along with program type. This article thus adds to the research that television advertising, especially direct response television advertising has proven to influence consumer behaviour.

These last articles provide important background for our study. Consumers do take actions after consuming advertising messages. In this instance, they made a telephone call. This shows that consumers respond using other mediums. Consumer behaviour can be said to be affected by television advertising. One important caveat here is that the advertising message has to be relevant and the product within the person's consideration set before this behavioural outcome occurs. The results point to television exposure creating a change in consumer behaviour further down the hierarchy of effects paradigm. Our study will expand upon previous studies to incorporate the relatively new channel of search engines and study traditional advertising's impact on online behaviour.

Online Advertising Effectiveness

Online marketing has only been around for a few years but already has made a huge impact on advertising. There have been few academic studies that attempt to demonstrate the effectiveness of online advertising. There have been numerous studies conducted by agencies and companies. One such study by the Interactive Advertising Bureau and Nielsen Net Ratings is showcased in *Advertising Age* (Maddox 2004). Their findings suggest that search engine marketing ads and contextually targeted online text ads can have a significant impact on branding. The research studied the impact of search and contextual text ads on an array of brand metrics, including aided brand awareness, unaided brand awareness, brand image association, and purchase intent. The results indicated that the text ads caused a 23% lift in unaided brand awareness among respondents who saw the ads compared with those who did not. There have been few studies that look at search engine marketing specifically; the above results provide that evidence that search engine advertising can be effective.

Cho (2003) also analyses banner advertising effectiveness. His study examines levels of involvement in relation to online advertising, in this case banner advertising. He defines voluntary exposure to the ad as someone who clicks on the banner itself. Based on Petty and Cacioppo's Elaboration Likelihood model (1986), consumers in low involvement situations use low levels of elaboration to process advertising messages and thus engage in the peripheral route to persuasion, while consumers in high involvement situations have high elaboration levels and engage in central route processing. The author used this theory as a basis for his research.

The findings of the study indicate that those with high product involvement were more likely to click on the banner ad. The main managerial implication is that the consumer's level of product involvement can be used to identify target audiences for advertising campaigns on the

internet. In addition, the study also found that the positive relationship between peripheral cues (banner size, animation) and banner clicking were more prominent among those with low rather than high product involvement. This study also adds evidence to the fact that levels of involvement can play an integral in advertising response.

Manchanda et al (2006) study the effect of online advertising in relation to online purchase. Their main research question is whether or not advertising affects purchasing patterns on the internet. They measure the impact of banner advertising on current customers' probabilities of buying again, while accounting for duration dependence. Some findings from previous research indicate that click-through is a relatively poor measure of advertising effectiveness because it results in a very small proportion of overall purchases. Also, banner advertising has attitudinal effects and that clickthrough is a poor measure of advertising response. They authors develop a model which investigate the purchase behavior of customers who are exposed to banner advertising by the web site. A total of 13 weeks' worth of data were collected for one web site.

The results show that exposure to banner advertising has a significant effect on internet purchasing. As a managerial implication, campaigns should be designed such that customers are exposed to fewer (and more consistent) creatives across many pages and web sites. The above findings are noteworthy in our proposed study because online advertising has been proven to be effective. Behavior can manifest itself into actual purchase and not just attitudinal change as demonstrated above.

The previous studies help demonstrate the effectiveness of online advertising. They do for the most part only consider banner advertising and search related advertising is largely

ignored. Our proposed study examines consumer search behaviour specifically. Advertisers can place ads in relation to specific keyword queries users make; academic research on the effectiveness of this kind of advertising strategy is lacking. Display advertising is also situated at the exposure level in Scholten's hierarchy of effects paradigm; the impact of consumer search behaviour further down the process has not been examined.

Interactivity

Another important stream of research that we consider is interactivity. Interactivity is of importance in our study since the synergistic effect we will attempt to measure is interactive in nature. Companies can respond to search queries by customers in an interactive fashion.

The first article we examine in this field comes from Liu and Shrum (2002). The authors attempt to identify the key constructs around the notion of interactivity. There are three aspects of interactivity that they identify. Active control is the voluntary and instrumental action that directly influences the controller's experience. Two way communication which is reciprocal communication and synchronicity which is the degree to which user's input into a communication and the response they receive from the communication are simultaneous. There is also a difference between structural and experiential interactivity. Structural interactivity refers to the hardwired opportunity, or the real opportunity to engage in information exchange. Experiential interactivity refers to the perception of interactivity. The authors also state that the nature but also the level of interactivity can differ. The reason for their research is that previous studies have shown inconsistency.

In their model of interactivity, user cognitive involvement is introduced. Interactivity creates cognitively involved experiences through active control and two way communication. The reason for this addition is that users are actively engaged in the communication process on the internet. The authors offer several propositions as a program of research. The most interesting proposition in relation to our research is P2 which states that two-way communication is positively related to user cognitive involvement. This proposition might better help us understand how interactive communication on a search engine is related to user involvement.

Another study of interest comes from Levy and Nebenzahl (2006). They examined programme involvement and interactive behaviour in interactive television. Even though interactive television is not part of our research, the interactive nature of the relationship between involvement and interaction is of interest to us. Interactive television (ITV) is a form of technology expected to grow in the years to come and advertisers have begun using this new form of advertising. The authors state that the factors that influence how viewers process television advertisements are: the attributes of the advertised product and the corresponding advertisement messages, the medium that carries the advertisement and its environment and attributes of the viewer and his or her state of mind while receiving the communicated advertisement. Another principal element is the consumer's level of involvement with the programme. High programme involvement may block mental processing of the advertisements but the opposite approach is also examined. Appendix 6 shows the results of the study. Results indicated that the likelihood of entering interactive behaviour is negatively impacted by the viewer's involvement in the programme, but only after a certain threshold is passed. Important managerial implications of this research are that the likelihood of entering into interactive behaviour is determined by the media environment and the content of the advertisements in

relation to the interests of the target viewers. Also, the extent of interactive behaviour given that the viewer entered that mode, is determined solely by the content of the ads in relation to the interests of the interactive viewers. This outcome is of interest to our study, programme involvement is a mediating variable that needs to be considered. Interactive behaviour will occur in an online setting but might be influenced by programme type and content of the ad. Unfortunately, this is a key limitation to our study since user involvement is not measured.

A study by Fortin and Dholakia (2005) focuses on how new media are similar and/or different from traditional media and how these differences might influence advertising effectiveness. Fortin and Dholakia state that the web gives users the ability to respond and react to advertisements which changes the traditional parameters of advertising. They define interactivity as: the degree to which a communication system can allow one or more end users to communicate alternatively as senders or receivers with one or many other users or communication devices, either in real time (as in video teleconferencing) or on a store and-forward basis (as with electronic mail), or to seek and gain access to information on a on-demand basis where the content, timing and sequence of the communication is under control of the end user, as opposed to a broadcast basis. They add vividness as a construct, vividness relates to the breadth and depth of the message: breadth being the number of sensory dimensions, cues, and senses presented (colors, graphics, etc.), and depth being the quality and resolution of the presentation. They propose the model of the impact of interactivity on advertising effectiveness (Appendix 7).

The results supported that there is a positive relationship between the degree of interactivity of an advertisement and the social presence it conveys; the most significant impact of interactivity is on social presence. The most important result for our study is that vividness

and interactivity both impacted social presence and indirectly, involvement. Thus, web advertising can be seen to impact attitude change and is an important channel for marketing communication.

Search marketing ads are also based on relevance. Marketers can adjust their ads based on the results they obtain thus attempting to increase the relevance of each ad. In terms of the hierarchy of effects paradigm, marketers can help stimulate behavior by being present during consumer searches related to their products. They can also engage with consumers in an interactive fashion by optimizing their ads in order to increase relevance.

Cross-Channel Effects

The last line of research that will be examined, but perhaps the most crucial to our research is cross-channel effects. Since we will be looking at the effects of several different channels on consumer behavior, we must first examine previous academic research in this area.

One of the first studies to examine synergistic effects across media channels was from Edell and Keller (1999). They studied the effects of a coordinated TV-print media campaign on consumers' comprehension and evaluation of advertising. The results of their research demonstrated that a coordinated television and print media strategy led to greater processing and improved memory performance than either television or print media alone. Also, the nature of the processing in the respondent's mind depended on the exposure order. Several important managerial implications were put forth. A print reinforcement strategy that links a print ad to an existing television ad that has been seen, can improve the chance of the print ad being read. The process is mediated by consumer motivation, ability and opportunity to read the ad. This result

adds to our theory that web and TV will create better recall and thus more action on the part of the consumer in an online setting.

Chang and Thorson (2004) study the synergistic effects of television and the internet. The goal of their study was to test the above effects and to compare the information processing model of synergy with that of repetition. The study integrates television and web advertising since more and more of these two channels are used in conjunction. They base their research on Edell and Keller (1999) discussed above and Putrevu and Lord (2003); these last two authors suggested that a second exposure to a novel stimulus containing similar information will attract more attention than exposure to the same stimulus. The results showed that TV Web synergy did produce an effect that was superior to the repetitive ad condition. The synergistic effects on perceived ad credibility, brand credibility, attitude toward the ad, attitude toward the brand and purchase intention were not found. Little impact on the consumer's affective and conative was noted, but more cognitive impact and finally higher overall processing were found.

Naik and Raman (2003) studied the impact of synergy in multimedia communications. They state that integrated marketing communications (IMC) emphasize the benefits of harnessing synergy across multiple media to build brand equity of products and services. They define synergy as the combined effect of multiple activities exceeds the sum of their individual effects. The authors wish to answer if synergy moderates the effect of advertising carryover and they wish to analyze theoretically the effects of synergy in multimedia communications.

Their resulting analysis presents evidence on the existence of synergy between television and print advertising in consumer markets. They provide interesting insight into budget allocation for advertisers.

Finally, we examined Briggs, Krishnan and Borin (2005) which conducted a case study on a real advertising campaign by Ford and its F-150 pickup truck. Ford was launching the F-150, their highest selling and most profitable truck and wanted to be able to measure the return on their investment. In multi-channel marketing, traditional media is experiencing declining audiences due to fragmentation of media channels and the rise of non-traditional channels the authors conclude. Online advertising on the other hand, is becoming a powerful new medium for driving sales through multiple channels delivering high-impact targeted messages and building brands.

The results showed the highest cost per impact is generated on television. The lowest was online. Some of the key learnings from the campaign analysis were: advertising works, but the price of some media has been bid up to make it inefficient compared to alternatives, and TV generates the greatest level of absolute reach and produces high levels of purchase-consideration impact, but is less cost effective compared to magazine and online.

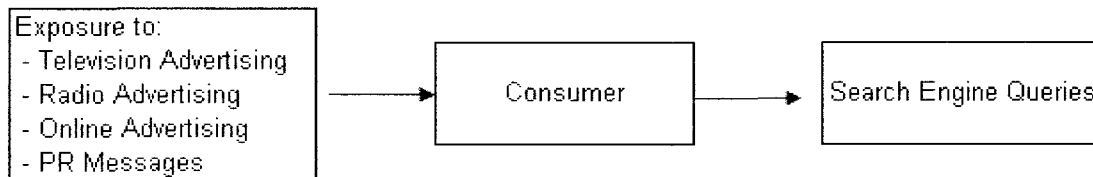
This case study is important because it demonstrates that cross-channel marketing is being currently used and being analysed not just in silos but congruently with other channels. The previous academic research helps us understand the synergistic effects across different media. For our research, claiming that there are synergies between search behaviour and multiple advertising channels will not be breaking new ground. Consumers move from exposure to retention to behaviour when exposed to multiple channels based on the extant literature. We will attempt to narrow our focus on behavioural changes in an online setting.

Chapter 3 - Proposal of New Research

In this section, we will propose new research in the area of cross-channel advertising and advertising effectiveness.

The literature review helped us establish that advertising can impact consumer behavior (exposure to retention to behavior). Traditional channels such as television as well as online display advertising have been proven to stimulate behavioral changes. We turn our attention to behavioral shifts online in particular brand searching behavior.

The proposed research will focus on multiple advertising channels and its effect on online search habits. The proposed conceptual model is as follows:



In relation to the hierarchy of effects paradigm, we wish to study the link between exposure and behavior. We seek to uncover the specific behavioral effects that occur in an online setting. Specifically, the impact of brand searching behavior is of particular interest. Does advertising exposure lead to brand searching behavior? This question is important to understand given multiple channel advertising today. The causal link between advertising exposure and search behavior has yet to be fully studied – in particular when it applies to brand searching. Consumers are looking for a company’s brand (behavior), how does traditional advertising (exposure) play a role in this reality?

Hypotheses

The extant literature on the subject of cross-channel effects on online behavior is relatively nascent. The effects examined in our study have not been previously tested.

H1: The number of search engine queries for a company's branded keywords is a function of the exposure to advertising placed in more than one medium (television, radio, online).

H2: An increase in total advertising expenditure will lead to increased searches for the company's brand online.

Based on Chang and Thorson's research (1999), multiple message sources enhance message credibility. They found that if a person is exposed to multiple message sources, they will hold positive responses towards that message. Harkins and Petty (1987) also find similar results; multiple sources lend credibility versus a single source. Our study looks at this process one step further and examines the subsequent effect of multiple advertising sources on online search behavior. The online search behavior signifies queries on the major search engines for that company's branded keywords. This synergistic effect is examined using existing data from actual advertising campaigns. All concurrent advertising campaign data was collected and compared against their online search behavior.

Furthermore, several additional hypotheses are tested for each medium

H3: An increase in television advertising will lead to increased searches for the company's brand online.

H4: An increase in radio advertising will lead to increased searches for the company's brand online.

H5: An increase in online advertising will lead to increased searches for the company's brand online.

Additional metrics from the company's web site were also captured; we will evaluate our hypotheses on these metrics as well.

H6: An increase in advertising exposure will lead to increased organic clicks

We hope to uncover using time series analysis any short-term and long-term effects of advertising exposure on the above hypotheses.

Data Collection Methodology

Data from a Canadian telecommunications company was gathered from January 1st, 2007 to June 30, 2008.

Television Advertising: The company employs television advertising on an almost continuous basis to help promote its products. Impression, cost and GRP (gross rating points) data were collected. Cost refers to the media cost for each television spot. Impressions refer to the estimated number of viewers of the television program in question. Data from all the Canadian markets and various business units were aggregated for this study

Radio Advertising: Radio advertising is also used consistently. Impressions and cost data were also captured. The data was aggregated from market specific data.

Online display Advertising: Online display refers to banner advertising on various web sites the company chose to advertise on. Impressions are counted each time the banner loads on person's browser.

Pay per click Advertising: Pay per click advertising or PPC refers to the sponsored results on a search engine. An advertiser can pay to have their listing appear when a person searches for a relevant keyword. A cost is only incurred from a person clicks on the company's listing. Data was collected from Google, Yahoo and MSN. Impressions, clicks, cost and sales were collected. Impressions refer to the number of times the advertiser's paid listing appeared alongside the users' queries. The total number of impressions is also able to be extrapolated from the search engines. Thus, an accurate idea of the total number of impressions was collected. Clicks refer to the number of times users' clicked on the advertiser's sponsored results. Sales data is obtained from each person's click as well. Each time someone clicks a cookie is installed on their browser and thus the sale can be tracked.

Organic clicks: In addition to paid traffic, natural search engine traffic was measured. Using the company's web analytics tool, visits coming from non-paid search were gathered.

Online site sales: Total online sales from the web site from the web analytics tool were collected. A sale refers to a completion and validation of a person making a purchase of any of the company's product on the site.

Press Release data: Using Google News the number of online articles that mentioned the company's name was collected. This piece of information is useful because it also indicates popularity of the company during any given week.

Control Data: Several additional sources of data were collected to serve as a control. Wages, salaries and supplementary labor income, personal disposable income, and personal expenditure on consumer goods and services were all collected from Statistics Canada.

Chapter 4 – Results

In this section, we will discuss the methodology employed to analyze the data and the specific results obtained for each of our hypotheses.

Here is an overview of the methodology employed for the analysis:

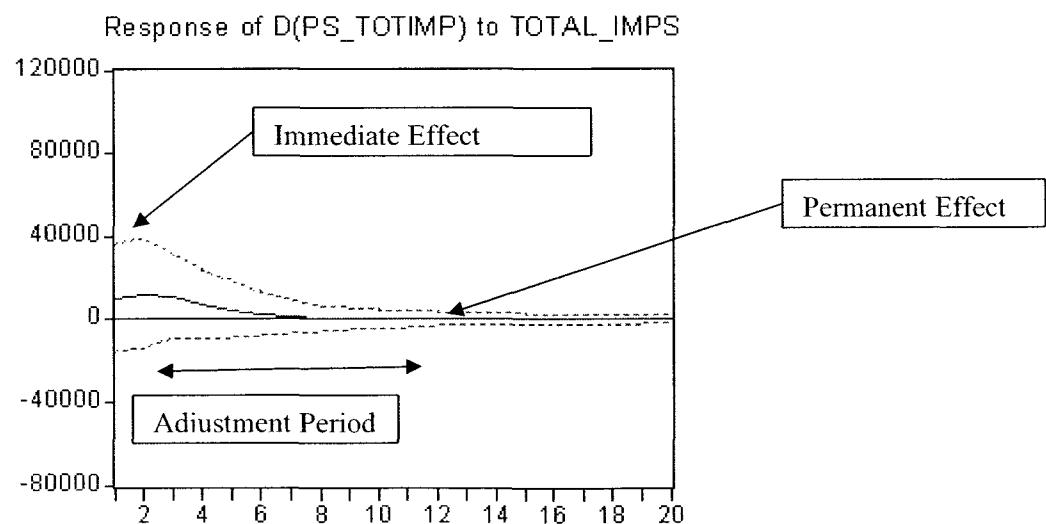
- 1) Conducting Unit Root tests to determine whether or not data is stationary over time
- 2) Estimating the vector auto-regression models
- 3) Generating corresponding impulse response functions which examines the effect of a one standard deviation shock to one of the endogenous variables – in this case marketing spend or media impressions (Dekimpe et al, 1999). T-tests were then conducted.

Results

The VARX models tested the five hypotheses proposed earlier. Below are the results for each.

H1: Brand impressions in relation to paid media impressions

Figure 4.1: IRF – Total Impressions on Branded keywords in response to Total Media Impressions

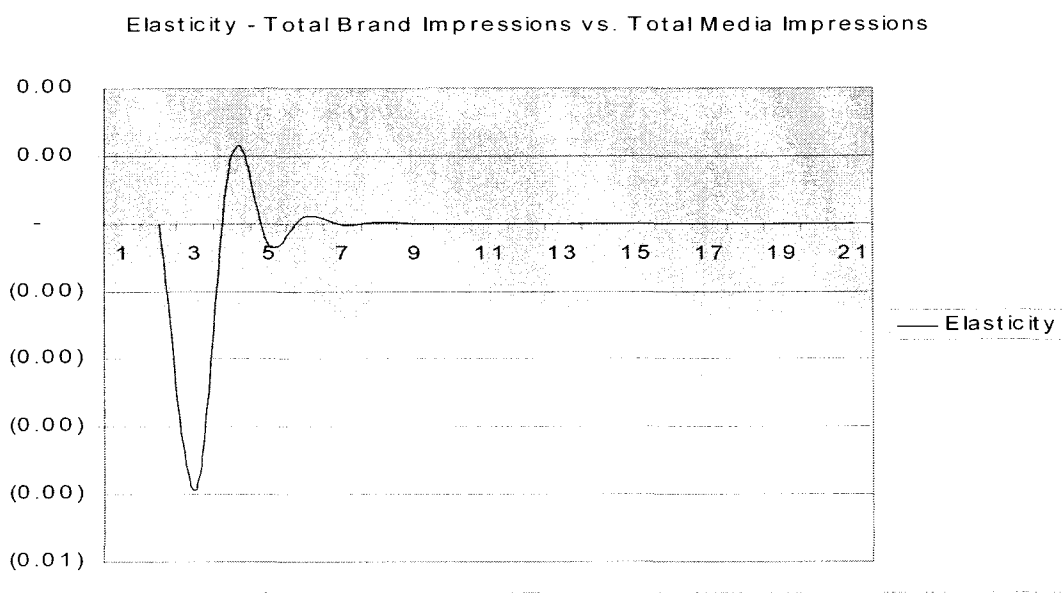


There is an immediate effect of total marketing impressions on branded keyword impressions which lasts two weeks as shown above in the impulse response function. According to Pauwels et al 2002, the adjustment period refers to the period between the immediate response and the time where the effect returns to normal. This type of analysis has been conducted for price promotions but does apply to customer research behavior as well.

The adjustment period lasts for 9 periods and we see increased customer reaction on the search engines as well. The permanent effect is minimal and is perhaps due to the fleeting nature of advertising messages; they make an immediate impression on a person's consideration set. The significance was calculated using a t-test, the cutoff point was 1.0. For H1, the t-test was 1.21; thus this hypothesis was deemed significant.

Elasticity was also calculated – the net effect during week two was -0.0039; this was the largest elasticity from the hypotheses tested. Paid media impressions from all different media channels combined influenced brand queries to the largest extent.

Figure 4.2: Elasticity of Total Brand Impressions vs. Total Media Impressions



H1: Brand impressions in relation to paid media expenditure

Figure 4.3: IRF – Total Impressions on Branded keywords in response to Total Media Expenditure

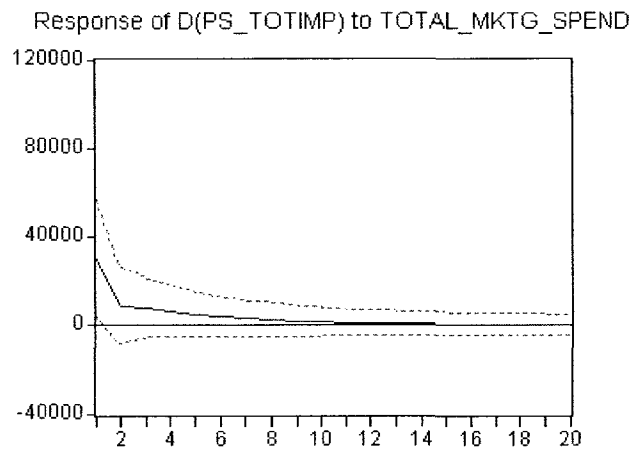
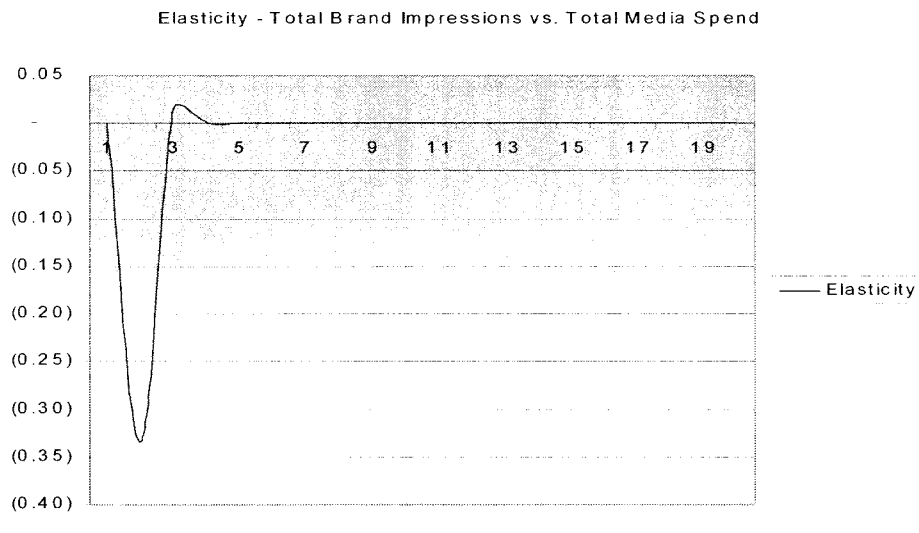


Figure 4.3 displays results from the test of marketing expenditure's effect on brand keyword searches. Total marketing expenditure had a similar impact as media impressions on branded keyword searches though to a lesser extent. The t-test result was 1.09 and was also significant.

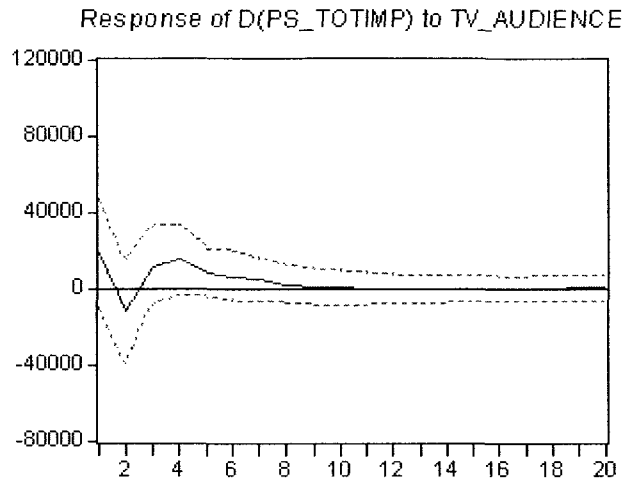
The elasticity at week two was -0.33, (figure 4.4). This is the second highest of the hypotheses tested. Marketing spend as a whole did have a significant impact on customer search behavior.

Figure 4.4: Elasticity of Total Brand Impressions vs. Total Marketing Spending



H3: Brand impressions in relation to television impressions

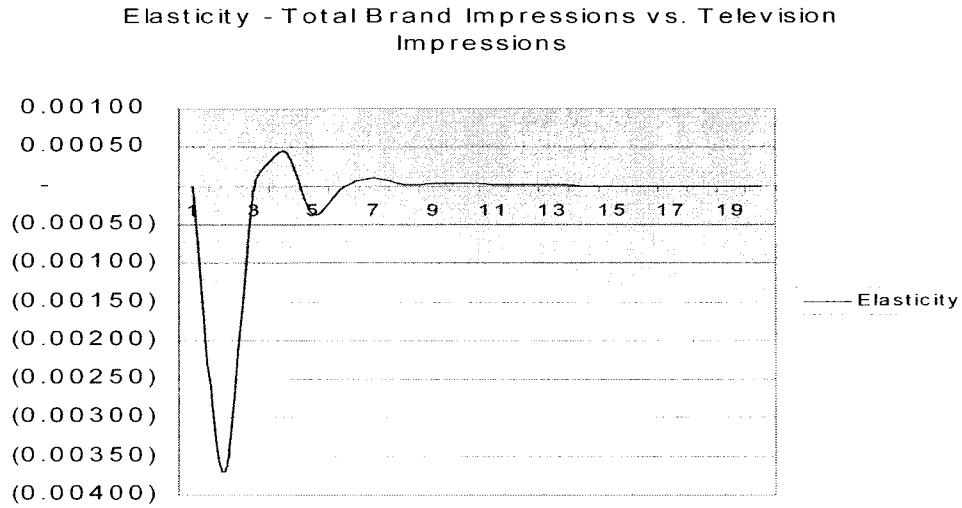
Figure 4.5: IRF – Total Impressions on Branded keywords in response to Television Impressions



Television impressions had an impact on brand search behavior during the first 10 periods. Interestingly, there is a peak followed by a valley. The elasticity was 0.0003 at the second period which resembles the marketing expenditure & impressions elasticity. The overall impact of television is significant as well with a t-test of 1.89.

Television exposure has a fairly long term effect on search behavior. The message delivered has much more impact than other types of advertising messages. A 30 second spot allows people that are interested in the brand to obtain valuable product information with two senses, sight and sound. The result is a longer term effect on brand searching behavior.

Figure 4.6: Elasticity of Total Brand Impressions vs. Total Television Impressions



H4: Brand impressions in relation to radio impressions

The effect of radio exposure on branded keyword searches was noted during the first 4 periods followed by a subsequent drop off. The adjustment period is less significant than marketing impressions, expenditure and television impressions.

Figure 4.7: IRF – Total Impressions on Branded keywords in response to Radio Audience

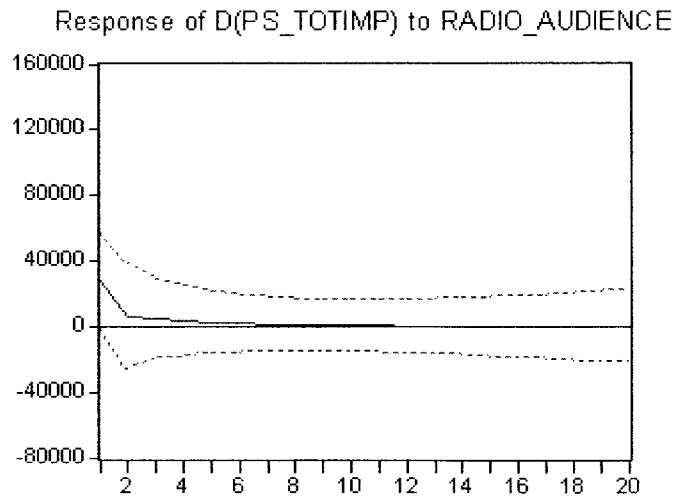
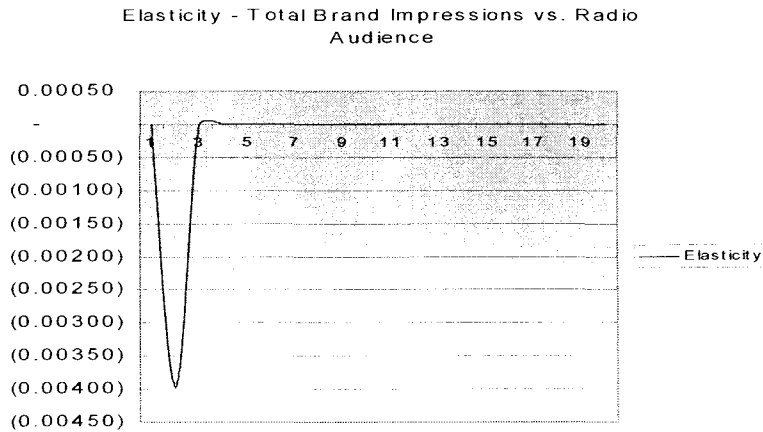


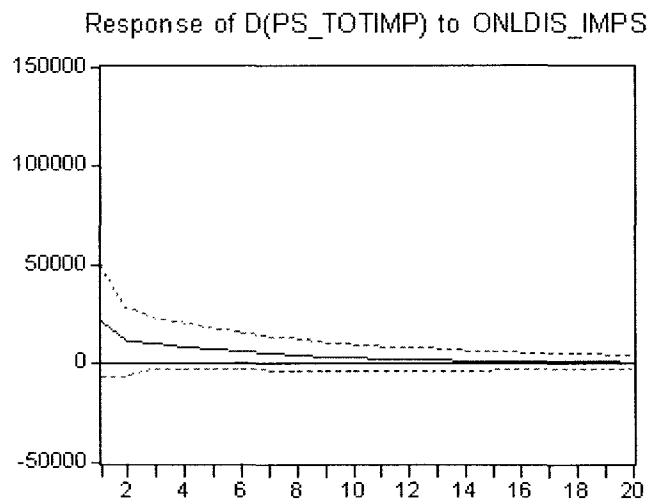
Figure 4.8: Elasticity of Total Brand Impressions vs. Radio Audience



This variable had the same elasticity as the television during the first period but it rapidly drops off. The t-test yielded a result of 0.51 and we concluded that the overall impact of radio was not significant.

H5: Brand impressions in relation to online advertising impressions

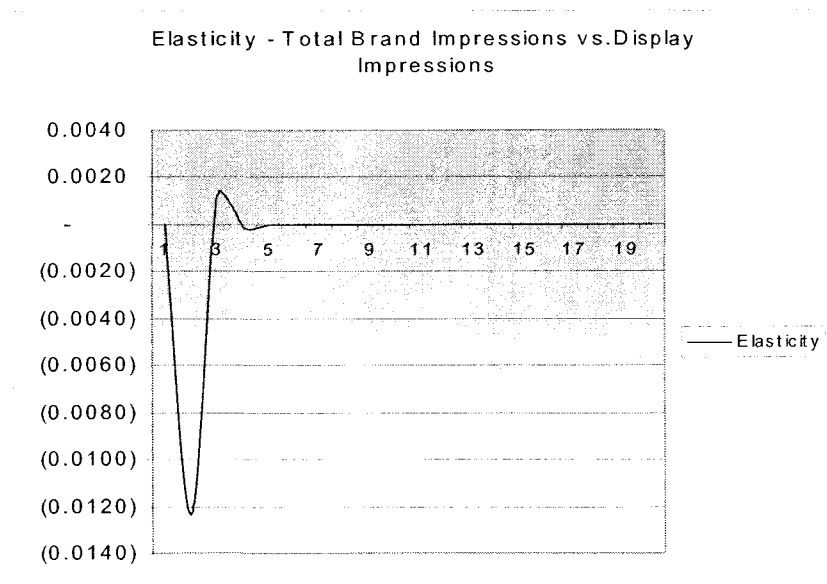
Figure 4.9: IRF – Total Impressions on Branded keywords in response to Online Display Impressions



Online display advertising had a significant impact on searching behavior as illustrated by the impulse response function (Figure 4.9) and the elasticity chart (Figure 4.10). The effect was more pronounced than television and radio exposure. The t-test showed a result of 1.52 and can be deemed significant.

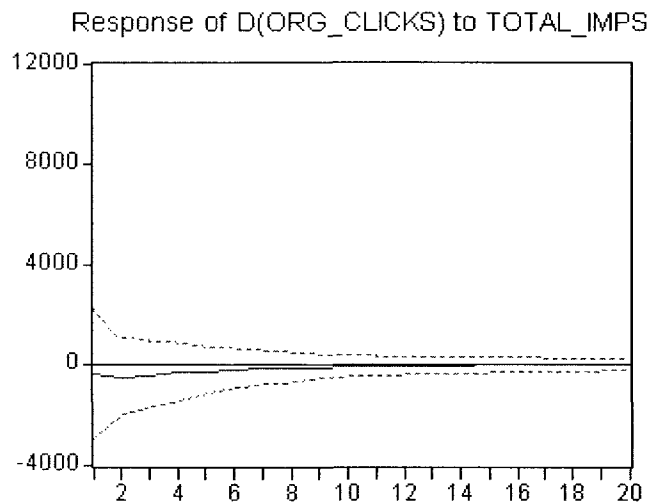
The result implies that online advertising engages people more than traditional media does. The fact that a person is already online surfing the web is a plausible explanation. A person exposed to display advertising and that is engaged with the message can much more easily search for related brand information since they are already online. The immediacy of the message is facilitated by the channel's interactive nature. In addition, the long term effect resembles that of television's which implies that online can also stimulate a change in search behavior over a long period of time.

Figure 4.10: Elasticity of Total Brand Impressions vs. Online Display Impressions



H6: Organic Clicks in relation to advertising exposure

Figure 4.11: IRF – Total Organic Clicks in response to Total Media Impressions



We also measured the effect of total marketing impressions on organic search traffic. The impulse response function (Figure 4.11). Organic traffic was not significantly impacted by total marketing impressions; the t-test was 0.59 and not significant.

Organic clicks measures all visitors coming from a search engine regardless of keyword category and is not paid for. A more in depth analysis can be conducted on organic traffic by examining the keyword category (i.e. branded versus generic). This would examine whether only branded keywords saw a lift or if general keywords (i.e. cell phone) also saw a lift.

Figure 4.12: Elasticity of Total Organic Clicks vs. Media Impressions

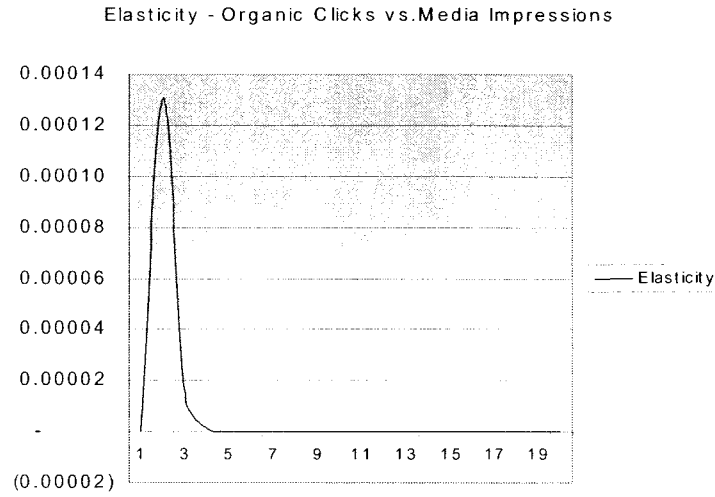


Figure 4.13 summarizes the results of each of the six t-tests. The cut off point used was 1.0. Radio exposure was not found to be significant. The impact of media impressions on organic clicks also did not yield significant results.

Figure 4.13: T-Test Results for Each Hypothesis

Channel Tested	T-Statistic	Significant?
Total Marketing Spend	1.21	Yes
Total Marketing Impressions	1.09	Yes
Television Impressions	1.89	Yes
Radio Impressions	0.51	No
Online Display Impressions	1.52	Yes
Organic Clicks	0.59	No

Chapter 5 – Discussion and Implications

This chapter will discuss the results found in our study, the methodological limitations and important implications/applications for marketers. We will conclude with suggestion of future studies.

The effect of cross-channel advertising online is a relatively new field of study. No previous study has attempted to examine the effect of offline advertising's impact on search behavior online. This paper took the first step by examining long term and short term effects of offline and online advertising on search behavior, more specifically searches for the advertiser's brand on search engines. The adjustment period and total effects of advertising were examined on brand search queries.

Main results

Figure 4.14 shows the results of each of the tested hypotheses. Total marketing impression, total marketing expenditure, television and online display exposure were found to have significant impacts on brand searches. Radio exposure did not meet our significance test minimum. The impact of total marketing impressions on organic clicks was also found to not be significant.

Figure 4.14: Results of Each Hypothesis

Hypothesis Tested	Supported?
Hyp 1: The number of search engine queries for a company's branded keywords is a function of the exposure to advertising placed in more than one medium	Yes
Hyp 2: An increase in total advertising expenditure will lead to increased searches for the company's brand online.	Yes
Hyp 3: An increase in television advertising will lead to increased searches for the company's brand online.	Yes
Hyp 4: An increase in radio advertising will lead to increased searches for the company's brand online.	No
Hyp 5: An increase in online advertising will lead to increased searches for the company's brand online.	Yes
Hyp 6: An increase in advertising exposure will lead to increased organic clicks	No

This study found that there is a significant short-term increase in queries of the brand and that this increase does not sustain itself over time for four of the channels that were tested. Total marketing spending and total advertising impressions had the greatest short-term impact on brand queries. The adjustment time only lasted three time periods (weeks) and then leveled off. The elasticity was greatest during the first three time periods.

The same was found for television and online display's effects on brand search although to a lesser extent. The total effects of all the advertiser's efforts sustained a lift in brand queries albeit for a short period of time. The effect of online display advertising was more pronounced. The immediacy of the medium allows searches for the brand to occur much more readily than through traditional channels.

Marketing Implications

Given this short term impact on search engine behavior, marketers must be aware of this short-term effect and plan their search marketing media presence accordingly. The recognition of this change in consumer behavior must be seen as an opportunity to provide additional information to potential customers searching for your brand. Customers once exposed to traditional and online advertising have a tendency to search for additional brand information using the search engine of their choice.

Marketers must better understand this dynamic and be ready to capture these customers further down the purchase consideration process. Sholten's hierarchy of effects model shows that customers move from awareness to retention to behavior. This study has shown that awareness through traditional advertising channels helps customers move down to actual behavior. The behavior in question is brand searching online. This represents an important finding for the advertising and marketing community since it helps better understand how customers seek out information on their own using online platforms.

Marketers cannot be content with just using regular channels to capture customers. Customers are no longer passive; they actively seek out information before committing to buy from a company. Marketers must be ready to use new media channels to present additional product information, purchase incentives to satisfy customers' need to better understand the product they are interested in buying.

Managerial Applications

Marketers must ensure that messages are consistent across the different advertising channels. If a promotional offer is presented in a television ad, it must be also promoted with the paid search ad. This will ensure an integrated marketing campaign and that the message remains consistent throughout the customer experience.

In addition, marketers must be cognizant of the fact that large advertising campaigns will drive more traffic to their web site and this additional traffic must be able to be sustained through the company's servers.

Given this increase in customer interest in a company's brand, marketers can seize this opportunity to present additional purchase incentives. Customers that are looking for a company's brand are more likely to be ready to purchase than customers looking for more general keywords. Thus, marketers can present additional offers or even just store location information to help these customers purchase their products. This can be done on the landing page the traffic is being directed to.

An important implication of this study is that firms must seek out to maximize brand related queries with their marketing endeavors. Since brand queries are known to occur during the short term, firms must design their media plans to maximize customer search behavior immediately. This can be done by proposing additional information on the company's website.

Marketing materials must then clearly expose the company's URL so that customers will be able to either go to the site directly or use their preferred search engine to reach it. In addition,

the various advertising components can be timed together to generate more visibility and thus increase brand search potential. If multiple media channels are running at the same time, for example television used in conjunction with online display, the chances of a customer seeing the ad and searching increase. A firm's search marketing initiative must be prepared to face the increased demand for brand related terms and also be able to explain the increased results. Firms must be aware of the synergistic effects that media have with searching behavior and attempt to capitalize on it as much as possible. Customers looking for a firm's product information are key in aiding sales and revenue. Firms should focus on providing product – service information as soon as customer intent is made known.

Limitations

There are several limitations of our study which we will examine here. Firstly, user involvement with the advertising message in question was not captured. The relevance of the advertising message to the person is not captured by the data. Using only secondary data does not permit us to examine whether or not the actual message did resonate with the person. Aggregation of the data permitted the time series analysis but an exact correlation cannot be determined.

Current brand awareness might impact how the person perceives the brand and thus their searching behavior. A less well known brand might not display the same effect – thus replicating the study with a different brand from a different industry will help validate the results.

Existing customers looking for the company's brand are also not precisely measured. A certain amount of the brand queries might have originated from existing clientele thus eliminating the need to advertise directly to them. This is a reality of any advertising initiative.

Possible Future studies

Our study examined the telecommunications industry specifically. As an additional means of supporting our findings, a similar study can be replicated using a different industry entirely. Customer search behavior might vary across different industries and it would be important to verify that these results hold true across different products and services.

Possible future studies in this area might involve looking at web analytics data more in depth to understand the quality of each visit on the company's site. Looking at this web data will help better understand the behavior of the visitors that came from a web search versus the rest of the visitors coming from different channels.

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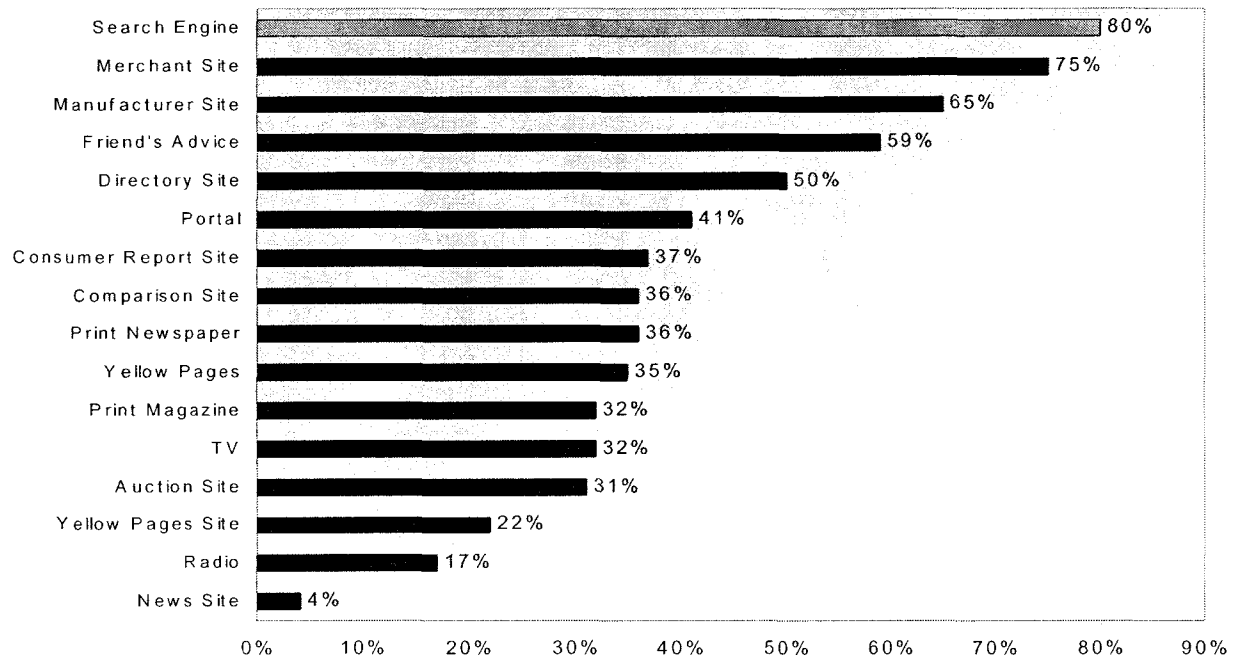
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Appendix

Appendix 1 – Where users go to research before completing an offline purchase. (Google 2004)

Source: Google/Jupiter Research Survey 2004



Appendix 2 – Global Expenditure by Medium (Source Zenith Optimedia, 2007)

Global advertising expenditure by medium

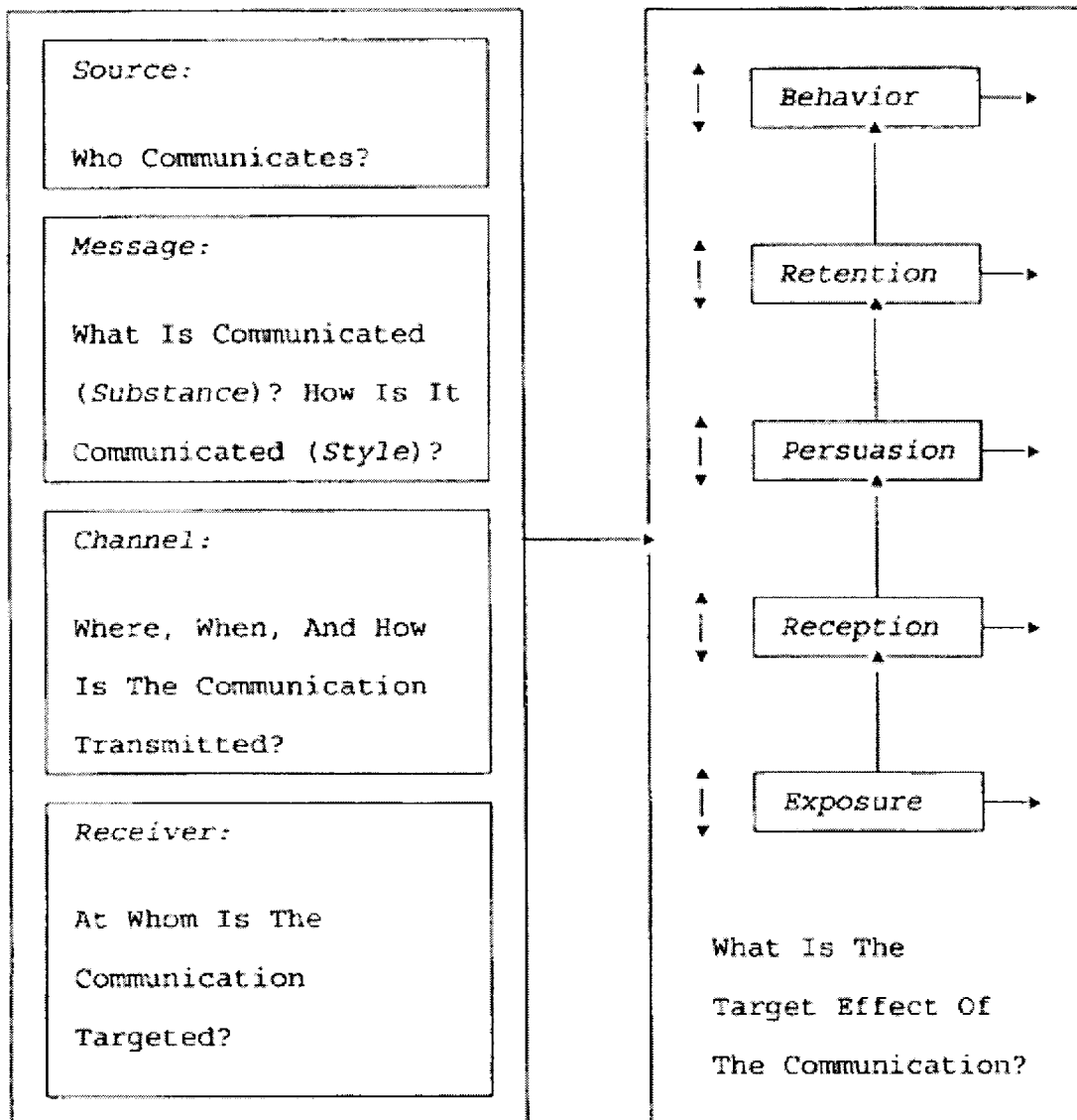
US\$ million, current prices Currency conversion at 2005 average rates.

	2005	2006	2007	2008	2009
Newspapers	119,269	123,405	126,191	130,231	133,719
Magazines	52,772	54,604	56,445	58,626	61,154
Television	150,881	160,670	167,823	178,735	186,412
Radio	34,382	35,334	36,347	37,503	39,105
Cinema	1,740	1,836	1,950	2,135	2,356
Outdoor	21,806	23,775	25,483	27,396	29,487
Internet	18,727	24,385	31,271	37,910	42,912
Total	399,577	424,008	445,511	472,536	495,145

Share of total adspend by medium 2005-2009 (%)

	2005	2006	2007	2008	2009
Newspapers	29.8	29.1	28.3	27.6	27.0
Magazines	13.2	12.9	12.7	12.4	12.4
Television	37.8	37.9	37.7	37.8	37.6
Radio	8.6	8.3	8.2	7.9	7.9
Cinema	0.4	0.4	0.4	0.5	0.5
Outdoor	5.5	5.6	5.7	5.8	6.0
Internet	4.7	5.8	7.0	8.0	8.7

Appendix 3 – Revised Information Processing Model (Scholten 1999)



Appendix 4 – Results from DRTV Effectiveness Study (Danaher, Green 1997)

TABLE 2
 Characteristics of Direct Response Television
 Advertisements

	Percent of Advertisements	
	Present Study (n = 722) ^a	Bush and Bush, 1990 (3) (n = 709)
Time of Day		
Morning (6 a.m.–noon)	25.9	38.8
Afternoon (noon–6 p.m.)	43.4	22.6
Primetime (6 p.m.–10:30 p.m.)	12.3	15.5
Fringe time/Late night (10:30 p.m.–6 a.m.)	8.4	23.1
Day of week		
Sunday	28.1	21.2
Monday	39.9	44.7
Wednesday	32.0	34.1
Type of Advertisement		
National	82.6	80.3
Local	17.4	19.7
Classification of Product		
Product	47.0	44.3
Service	53.0	55.7
Program Type		
Documentary	16.3	—
Soap opera	21.3	—
Variety	7.1	—
Comedy	9.1	—
Sport	8.0	—
Movie	11.1	—
Drama	13.7	—
News	13.4	—

Appendix 5 – Model of Information Processing for Banner Advertisements (Yoon 2003)

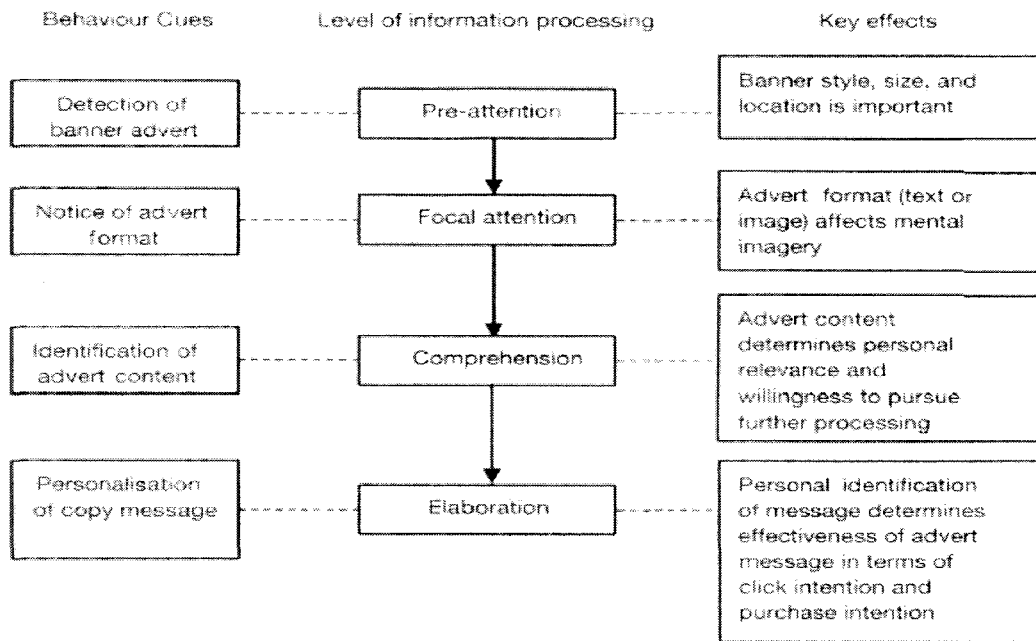
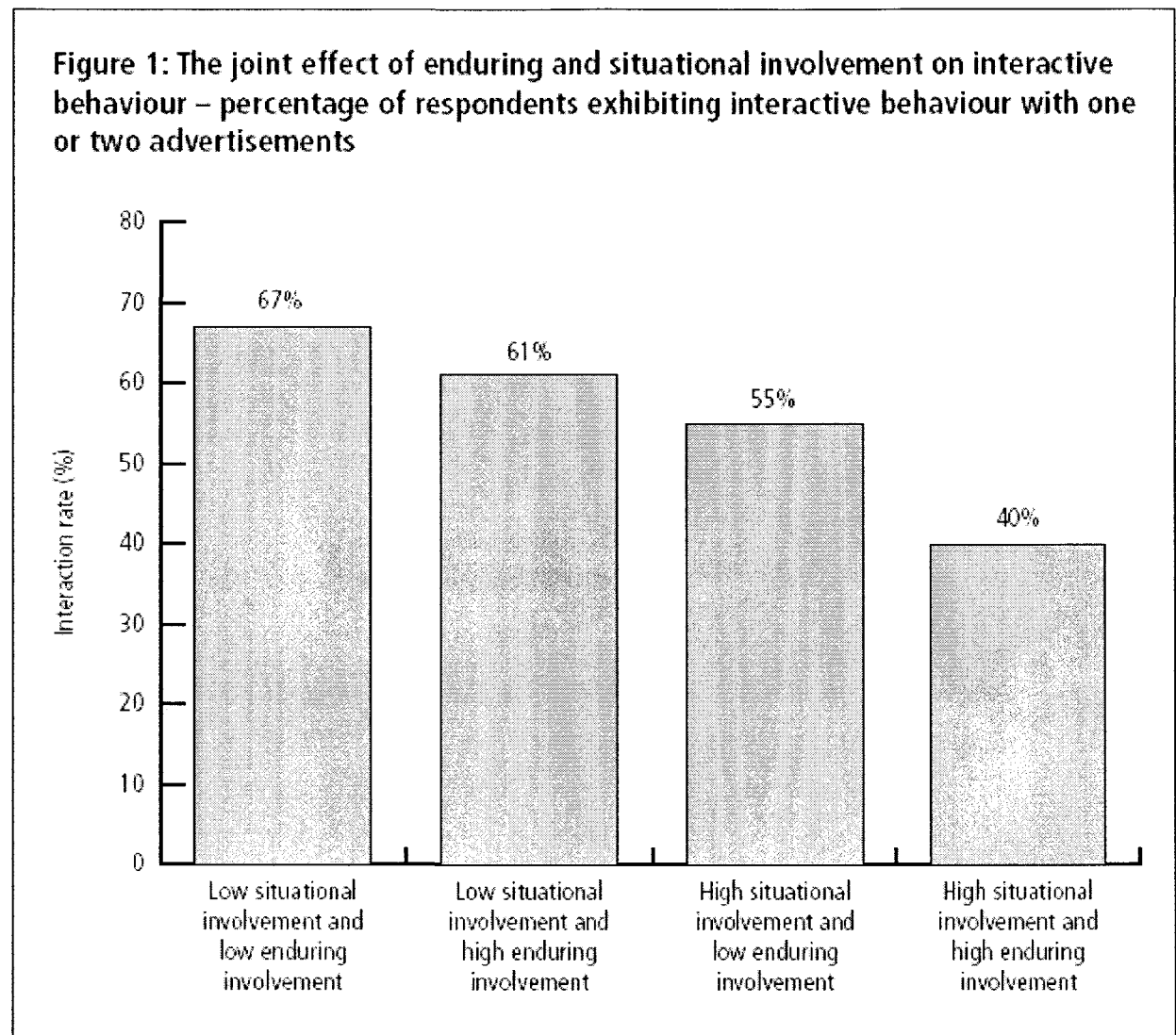


Figure 1 A model of information processing level for banner adverts

Appendix 6 – Effect of Enduring and Situational Involvement on Interactive Behaviour (Levy and Nebenzahl 2006)



Appendix 7 – Multistep model of the impact of interactivity on advertising effectiveness (Fortin Dholakia 2005)

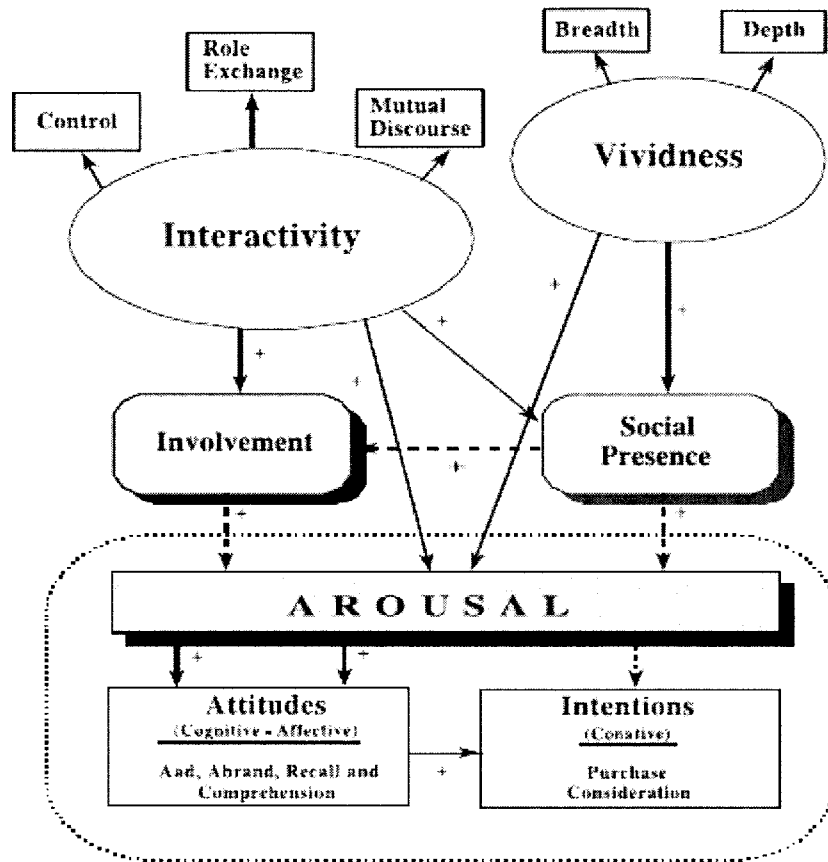


Fig. 1. Multistep model of the effects of interactivity on advertising effectiveness.