THE SONIC BOOM: EFFECT OF LOGO PRESENTATION STYLE IN TELEVISION COMMERCIALS ON MEMORY FOR THE ADVERTISED BRAND

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The undersigned, appointed by the dean of the Graduate School,

have examined the thesis entitled

The Sonic Boom: Effect of Logo Presentation Style in Television Commercials on Memory for the Advertised Brand

Presented by Arun Kartik Venkataraman,

a candidate for the degree of Master of Arts,

and hereby certify that, in their opinion, it is worthy of acceptance.

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DEDICATION

To Mom and Dad
I wouldn't be here without your persistent encouragement,
especially through trying times.

To my sister, my brother-in-law, and my darling niece Sanjana

And finally to Mizzou!

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A huge thank you to my committee. Your insights, suggestions and comments made the overwhelming experience of writing my thesis more enjoyable.

Thesis Chair: Dr. Paul Bolls.

Committee Members: Dr. Kevin Wise

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ABSTRACT

This study examines the effect of a structural feature of commercials called sonic branding on recognition and cued recall. A sonic brand or sonic logo can be defined as a unique auditory identity for a brand, also called an audio logo.

The design was a 2 (Logo Style: Sonic v/s Visual) x 3 (Television commercials) fractional repeated measures experiment. Logo style was the within-subjects factor with two levels, the sonic-style logo and the visual-only style logo viewed in the commercial. Television commercial was also a within-subjects factor, with three commercials shown at each level of logo-style. Participants were randomly assigned to one of 6 conditions.

Brand recognition was tested using a signal detection analysis. Cued brand recall was analyzed through use of a paired sample t-test. The findings suggest that brand recognition is more sensitive for ads with a non-sonic style logo than for ads with a sonic style logo. Sonic branding also does not significantly affect cued brand recall.

CHAPTER 1: INTRODUCTION

We all remember the time when the ice-cream truck would come along in the neighborhood. Our ears would perk up immediately on hearing the ice-cream truck play its four-note jingle. And our eyes would transfix themselves onto our small piggybank to count the change. Here, the sound of the ice-cream truck is the stimulus that arouses our interest and induces our euphoric reaction.

In much the same way, sounds are being used to create a desired action or reaction for brands. It's called *sonic branding* or a *sonic logo*. More specifically it is an auditory identity for a brand. It includes the sounds/tones associated with a brand. It has become a critical structural feature of many television, radio and interactive commercials, and is being used by companies to create brand identity and affect brand perception.

A fundamental element of television advertising is the presentation of the brand through use of different logo styles. Currently, television advertisers use two different logo styles. There is the visual-only logo style, where the visual logo of the brand appears at the end of the television commercial. And there is the sonic logo style, where the visual logo is accompanied by a sonic logo, which appears simultaneously at the end of the commercial. Researchers have yet to study how a sonic logo would impact memory, which is what this study seeks to do.

CHAPTER 2: LITERATURE REVIEW

Defining *brand* and *logo*

Before we define sonic branding, it's important to define the concepts of *brand* and *logo*. These may be generic terms that are used in everyday lingo, and that is exactly why they need a specific definition.

A *brand* as "an identifying mark burnt on livestock" was the original definition (Anonymous), and it has been extended to the field of marketing since the advent of packaged goods and the industrial revolution. Marketing guru Phillip Kotler defines brand as "a name, term, sign, symbol, or design, or a combination of them intended to identify the goods or services of one seller or a group of sellers and to differentiate them from those of competitors." (Kotler, 2000)

According to Kotler, a *logo* is a vital part of the brand. It is the face of the company and "a graphic element, symbol or icon of a trademark or brand and its logotype, which is set in a unique typeface or arranged in a particular way (Kotler, 2000)."

As a logo represents a company and its brands, it depicts an organization's personality.

The Sonic Branding concept

Sonic branding seems to have its roots around the time humans discovered or developed music, and later used music to peddle our wares. But it has gained recognition as a separate business discipline only in the last few decades, and has

gained sophistication only over the last few years. Music, the foundation for sonic branding, is a universally understood language and hence a powerful and feasible brand communications tool (Jackson, 2004).

Sonic branding is defined as **"**the structured process, in which the acoustic becomes a part of the brand and its brand identity. It may consist of an audio logo, a short jingle, or a brand theme (Jackson, 2004)." While a logo is a graphical element of the brand, the sonic brand is the audio element of the brand. The objective is to create a memory trigger, linking the product name, service or benefit with a pleasant memory. Sound is also the simplest way to bypass cultural and language barriers and delivers a corporate message on a global scale (Fisher, 2004).

Advertisers have recognized the effectiveness of sound for more than a hundred years, employing jingles as tools to help increase brand recognition and recall. For example, General Mills "Have you tried Wheaties?" jingle of 1929; Oldsmobile's "In my Merry Oldsmobile" in 1905, to GE's "We bring good things to life" jingles of the 1980s have all proved popular with audiences. So there is a precedent of music being used to sell products and services. Music in advertising has been studied as influencing attitudes towards the product (Gorn 1982; Kellaris & Cox, 1989; McInnis & Park, 1990). Studies on jingles have also focused on the consumer's mood (Alpert & Alpert, 1990) and the consumer's perception of an ad containing music of any form, about whether the ad is viewed as informative, upbeat, entertaining, etc. (Stout & Leckenby, 1998).

Music in advertising and cognition

Music and jingles have also been shown to influence the consumer's pace while shopping (Milliman 1982, 1986). Slower tempo music seems to slow in-store traffic flow. These research papers have addressed music from the affective side of consumer response, not from the cognitive side (Wallace, 1991).

Within the cognitive perspective, music in advertising has been viewed as a distraction (Park & Young, 1986). One of the first studies to probe whether music could serve as a recall aid concluded that jingles improve recall (Wallace, 1991). The study concluded that for music in advertising to be memorable, it should have a simple form with a basic pattern of ascents and descents, and a clear rhythmical pattern. The following quote from the study illuminates the relationship that jingles in advertising have to the rest of the ad:

> Music provides a very powerful retrieval cue. It is more than just an additional piece of information. It is an integrated cue that provides information about the nature of the text in the ad. The music defines the length of the lines, chunks words and phrases, identifies the number of syllables, and sets the pattern of stressed and unstressed syllables within the text. Thus music acts as the frame within which the text is tightly fit. That frame can connect words and music at encoding, and limit retrieval search.

Sound in radio advertising has been looked at from the physiological point of view, as to whether the structural features of radio advertising have resulted in an orienting response, and whether they affect memory. These structural features include sound effects, onset of music, production effects, character voices, and voice changes (Potter et al., 1997, 1998). Most recent research has shown orienting responses to auditory signals such as voice changes and special effects in radio messages (Potter, Lang & Bolls, 1997). Potter, Lang and Bolls (1998) identified auditory elements that

increase the structural complexity of a radio message. Their findings show that introducing sound effects, production effects, music, funny voices and changes between two very different announcers increases the amount of cognitive resources that listeners allocate to processing messages (Potter & Callison, 2000).

As we shall see later on, if structural features like music evoke an orienting response, it leads to greater encoding of and attention to the message, and better message storage. Potter and Callison (2000) also showed that increasing the number of such structural features in radio advertising leads to better recognition, free recall and positive attitudes about the promos and the stations that produce them.

Sonic Branding is more than jingles

A jingle cannot be the end of a sonic branding effort. It includes a much more integrated approach to using sound and music representing the brand values over various media.

Lisa Lamb, head of sonic branding for Interbrand, points out “sonic branding allows increased brand recognition across a variety of platforms, since people will hear things when they are not necessarily looking. One does not have to listen to hear, whereas one does need to be looking to see.” (Barnet, 2001)

Boom Sonic Branding, one of the many sonic branding agencies that thrive in the market, explains its services with the tagline “delivering a share of mind that visual branding alone cannot provide.” The challenge for agencies therefore is to create a sound(s) that is harmonious with the brand in question. SonicBrand, another such agency promotes itself by asking, “89% of all companies have visual logo guidelines, yet only 29% have sonic guidelines. Why? People have ears too, you know?”

A 360 degree approach to branding is the reason for the rise of sonic branding (Hein, 2006). Russ Glaser, group design manager for Microsoft Xbox 360, says, “It is the way of the future. At Xbox, we’ve created a ‘language of sounds’ associated with Xbox, and the same have been carried over into the ads.”

Procter & Gamble Co. recently experimented with in-store motion sensors that play the Charmin toilet tissue jingle when shoppers pass by its shelves. Many other companies are working sonic brands into in-store music and other background sounds. Starbucks, Barbie dolls, Intel, McDonalds, NBC and T-Mobile are some of the numerous companies that now have a sonic brand.

Evolution of Sonic Branding

Jean Pierre Bacelon, a French radio producer turned airtime salesman has been credited with identifying the benefits of sonic branding on radio in the mid-1980s (Jackson, 2004). He coined the term *“marque sonique”* and after analyzing and categorizing radio commercials of his era, he concluded that radio advertising containing sonic branding elements achieved greater success in awareness, sale and repeat purchase.

As Director of IP France, he started working closely with Media Sales and Marketing UK, which is when he created the English translation of his ideas – “sonic branding”. It was initially used by radio advertisers to pitch radio advertising and the use of sound as a powerful brand communication tool (Miller & Marks, 1992). In the UK, the Radio Advertising Bureau adopted the sonic branding sell to try and convince more advertisers to try out radio, during a time of lean growth for the industry. Growth

in dotcoms and new media in the late 1990s enabled venture capital to be made available for sonic branding agencies (Jackson, 2004).

In the new millennium, every media platform has sound built-in. Sonic branding provides the opportunity for companies to extend a common identity across various platforms, whether as TV, Internet, radio, podcasts, ringtones, online navigational sounds, website sounds, tones at point of sale areas in retail stores, cinema, cash registers, stadium public address systems, or the "hold music" of the company's customer service number.

This has led to a phenomenal growth in the number of sonic branding agencies. In the US, establishment of sonic branding as a specialized field is much more recent as compared to the UK. In 2001, there was one company specializing in offering sonic branding services in the US, one in the UK, and one in the Switzerland. Today there are more than 50 companies in the world, 35 in Europe alone (Lamb, 2006).

The theoretical framework – Sonic Branding and its impact on memory

We react to sounds all the time. From the ice-cream truck to the sounds of mom's stir fry, from our computer booting to receiving a new email, from a message on the cell phone to the ringing of the bell on the New York stock exchange.

The right brain, which is the emotional side, is where music is understood (Jackson, 2004). Recent research by Dr. Joseph LeDoux of New York University shows that a special part of the brain called the amygdala controls physiological responses (LeDoux, 2002). The amygdala is hard-wired into the brain's circuitry and its reaction to events such as sounds is what makes us react the way we do. It also plays a part in

memory, and helps us remember the events and other logical information that led up to the event.

How sonic branding affects attention and memory can be explained by the theory of Limited Capacity Model of information processing (Shiffrin & Schneider, 1977) and Limited Capacity Model of Motivated Mediated Message Processing (LC4MP) (Lang, 2006). These are the theories referred to for this study. The limited capacity model of information processing suggests that people only have a limited number of cognitive resources to use on understanding and remembering their world.

According to Annie Lang's LC4MP, processing messages involves three major sub-processes – encoding, storage and retrieval (Lang, 2006). These sub-processes occur constantly, continuously and simultaneously. Here's a brief description of Annie Lang's LC4MP model. It provides a theoretical basis to how individuals attend to and remember all forms of media messages.

This model has five major assumptions - first, about the nature of cognition, second about the nature of motivation, third about the nature of media, fourth about the nature of time, and finally about the nature of communication (Lang, 2006).

First, people have a limited number of cognitive resources to use up on the processes of perceiving, encoding, decoding and storing information. Second, people have two underlying motivational systems, the appetitive (or approach) system and the aversive (or avoidance) system (Bradley, 1994; Cacioppo & Gardner, 1999; P. J. Lang, Bradley, & Cuthbert, 1997). These systems influence cognitive processing, by activating automatically in response to motivationally relevant stimuli. Third, media are presented through multiple sensory channels and formats and are made up of variable

redundant streams of information (Reeves, Thorson, & Schleuder, 1986; Reeves et al., 1985; Thorson, Reeves, & Schleuder, 1986). Fourth, human behavior is constantly changing over time, and hence human cognition too is a dynamic process (Thelen & Smith, 1994). The final assumption about the nature of communication is that it is a continuous interaction between the human motivated information processing system and the communication media (S. Geiger & Reeves, 1993; A. Lang, 2000; Rafaeli, 1988).

LC4MP explains the three sub-processes of encoding, storage and retrieval. Encoding is creating a mental representation of the stimulus. Information that is not encoded is lost. For information to be encoded, resources need to be allocated to process it. These resources can be allocated as a result of automatic or controlled processing mechanisms (A. Lang, Potter, & Bolls, 1999; Schneider, Dumais, & Shiffrin, 1984; Wickens, 1984).

Orienting Response

Controlled allocation is related to a person's ongoing goals and interests. Meanwhile some resources are allocated automatically through the elicitation of an "orienting response." Abrupt loud sounds, infrequent events, unfamiliar objects, significant stimuli (e.g. our name being called out loud), all such events tend to attract our attention away from the task we are performing. This is also called "orienting reflex", "orienting response" (Sokolov, 1963) or a "what-is-it-reaction" (Ivan Pavlov, 1927). Research has shown that many structural features of television evoke an orienting response including scene changes, camera changes, loud noises, sudden movements towards the camera, and the onset of video-graphics (Lang, 2000). While

there has no been no research on orienting response to a sonic brand, it is reasonable to hypothesize that advertising that contains a sonic branding element, as a structural feature, would also evoke an orienting response.

LC4MP explains that attention to the message is increased if it evokes an orienting response. Any feature of the message that evokes an orienting response increases the resources allocated to encoding the message. Recognition tests indicate encoding.

The second critical sub-process is storage. It is the linking of recently encoded information to previously stored information. The more links a new piece of information has to old information, the better it is stored. So, for information to be stored in long-term memory, it needs to be encoded and linked to already stored information (Lang, 2006). Cued recall techniques can indicate storage.

Finally the third sub-process is retrieval. Again resources are required for retrieval of stored information. Free recall or unaided recall techniques can indicate retrieval.

These three processes are simultaneously occurring during media use (Lang, 2006). How much attention we pay to stimuli and how we allocate this attention – i.e. our limited cognitive resources – to processing media messages is explained by Annie Lang's theory. Limited cognitive resources are allocated independently to the three sub-processes out of the same fixed pool of limited resources (Basil, 1994; A. Lang et all., 1999a). When there are insufficient resources some processes will receive more resources and some will receive less.

Some of the studies that have used the LC4MP theory include Lang's study (2006) to design effective cancer communication messages using the LC4MP theory. This study analyzed the way in which structural and content elements of messages interacted with the limited capacity information processing system. Individual differences in people's motivational activation were found to influence both their tendencies to engage in risky behaviors that increase the probabilities of getting cancer and their processing of health-related messages.

The LC4MP theory has also been used to study the influence of appetitive and aversive activation on the processing of video games (Lang, 2006). Likewise research using this theoretical framework examined the online processing of television drug abuse prevention messages. It found out that increasing the structural pacing of television messages increases attention to and memory for the messages up to a point. This is done by increasing the resources allocated to encoding through the elicitation of an orienting response. But overload occurs when the messages are too fast to be encoded, resulting in memory inhibition (A. Lang, Schwartz, Chung, & Lee, 2004; A. Lang et al., in press).

Research using the LC4MP framework has also been conducted on other media. These identify the structural features that elicit an orienting response and the types of information presentation that are maximally effective. Both audio-only messages like radio, and computer-based or web-based messages have been investigated (Borse & Lang, 2000; Chung, Lee, Lang, Borse, & Buchman, 2002; A. Lang, Lee, Chung, & Borse, 2001; A. Lang et al., 2002).

As with television, research on radio has shown that increasing the pacing of audio structural features initially improves the memory for the message but eventually overloads the system and decreases memory for messages (Potter, 2000; Potter & Callison, 2000).

Research using LC4MP on web-based stimuli is still in its early stages (Lang, 2006). This research mainly examines non-audio based stimuli. Surprisingly it has been found that simple appearance of information on a computer screen does not elicit an orienting response. Instead research suggests that the content must be personally or motivationally relevant to elicit an orienting response. This in turn means that information on websites must rely on controlled resource allocation in order to be encoded; i.e. the viewer wants to pay attention to it.

One study on education multimedia did uncover that sound effects elicit orienting in computer users, and thereby increase encoding (Schwartz, 2005). However, the increase in encoding was not generalized to the message. Rather, these sound effects were found to increase memory for the sound and the animations increased memory for the animated object. This phenomenon is probably unique to computer and multimedia messages because users have control over the time of presentation (Lang, 2006).

Operationalization

In order to examine the way in which sonic branding affects memory, the key concepts surfaced from the above theories including encoding and storage need to be translated into measurable terms. Given the explanations of Lang and others, these

concepts can be operationalized into two terms - *brand recognition* and *cued brand recall*.

Brand Recognition

In the context of the LC4MP theory, we can define brand recognition as being directly related to performance on encoding. Brand Recognition is the extent to which a brand is recognized for stated brand attributes or communications. A broader view of brand recognition is the extent to which a brand is recognized within a product class for certain attributes (asiamarketresearch.com, 2006).

For instance, within the category of fast food, the ability of the McDonalds' *golden arches* logo to invoke an association with McDonalds means brand recognition is present.

Recognition has been widely studied in general and educational psychology (Craik, 1971; Eagle & Leiter 1964; Shepard & Cheng 1963; Haber 1970; Shepard 1967; Tversky 1973). A recognition test is one in which the subject is confronted with the original material among other material and asked whether it has been seen or heard before (Singh & Rothschild, 1983).

The stimulus in a recognition test must merely be identified as having been previously seen or heard (Bettman 1979). Klatzky (1980) developed three classifications of recognition testing procedures. The following is an extract from his book:

> 1. *Yes/no recognition test.* Subjects are shown a series of items, one at a time. As each item appears, the subject is to respond "yes" if s/he thinks it was on the original list and "no" if it was not. Usually, half of the items on the test are from the original list and the other half are foils.
> 2. *Forced-choice test.* In this procedure, subjects see two or more items at a time during the test. The task is to pick out the original stimulus. If the subject sees two items at a time, the

test is called a two-alternative forced choice; if three, a three-alternative forced-choice; and so on.

3. *Batch-testing procedure.* In this method, all the original stimuli and all the distractors are presented at once. The subject then tries to indicate which items were on the original list.

Cued Brand Recall

In the context of the LC4MP theory, cued brand recall indexes storage. It is a measure of how well a stimulus has been stored. Also called aided recall, it is a "method of post-testing the effectiveness of an advertisement or advertising campaign; respondents are shown products, brand names, trademarks, etc to assist their memories and recall the commercial or brand seen by them." It measures the extent to which an ad is remembered when elements of the brand are prompted (asiamarketresearch.com, 2006).

Recall is a widely researched phenomenon in psychology and advertising. The recall test is generally used in the advertising industry to measure television advertising effectiveness (Singh & Rothschild, 1983). In a *recall* test a subject is first given a set of information and is later given some minimal cue and asked to retrieve and reconstruct the original information. Hence, for *recall* the individual must describe the stimulus which is not present (Bettman, 1979). The cued recall test therefore, is a method of post-testing the effectiveness of an advertisement or advertising campaign.

The dependent variables therefore will be *brand recognition* which measures encoding and *cued brand recall* which measures storage. Hence while analyzing and comparing responses to sonic brands v/s the visual logo, we can understand differences in brand recognition and recall as the result of allocation of resources (attention) towards encoding, storing and retrieving the sonic brand and the visual logo.

The Hypotheses

Sonic branding has been established as an important weapon in the arsenal of the modern marketing communications manager. Yet, if sonic branding had an Achilles heel, it would be in evaluating its effectiveness.

There has been a lot of academic literature on branding, but not so much on sonic branding. Research has also been done on jingles and other structural features of ads, but very little academic research on sonic brands and sonic logos.

The first hypothesis arises out of the assumption that sonic branding increases attention by increasing the resources allocated to encoding through the elicitation of an orienting response. Messages that are better encoded would have a greater recognition.

Hypothesis I: Brand Recognition for a sonic logo style is greater than brand recognition for a visual-only logo style.

The second hypothesis arises out of the limited capacity model of information processing which states that people only have a limited number of cognitive resources to use on understanding and remembering their world. So if the use of a sonic logo style means greater resources are utilized for encoding it means fewer resources are utilized for storage.

Hypothesis II: Cued Brand Recall for a sonic logo style is less than cued brand recall for a visual-only style logo.

Practical Significance of this study

This study would help fill the gap in research about the relationship between brand recognition and cued brand recall with respect to sonic logo styles and visual-only logo styles.

This study would also be important to advertising managers. They would be interested in the responses of consumers when they see and hear a sonic brand. Do consumers remember or recall a sonic logo more than visual-only style logo? This study would help answer this question and help brand managers understand the dynamics between the brand and its consumers, and assess the impact of sonic branding on brand recognition and cued brand recall.

CHAPTER 3: METHODOLOGY

Design

This study was a 2 (Logo Style: Sonic v/s Visual) x 3 (Television commercials) fractional repeated measures experiment. Logo style was the within-subjects factor. It had two levels, the sonic-style logo and the visual-only style of the logo viewed in the commercial. Television commercial was also the within subjects factor. The three levels represented three television commercials that were used at each level of the logo style. Participants were randomly assigned to one of 6 conditions.

Independent Variables

Logo presentation style – visual-only logo vs. sonic logo - was conceptualized as a structural feature of television commercials that appears at the end of most commercials. This brand logo appearing at the end is either just a visual - in which case it is a visual-only logo style; or it is accompanied by a sonic logo that plays with the visual logo – in which case it is a sonic logo style.

Twelve commercials in all were embedded in an episode of *Friends*. Six of the commercials were target commercials that contained a visual-only logo or a sonic style logo. The remaining six commercials were filler commercials.

The six target commercials were chosen from six commercials that were edited into six visual-only style commercials and six sonic style commercials. Each commercial that can be used as a target commercial therefore had two versions – a visual-only style commercial and a sonic style commercial. The actual program contained six target commercials - three visual-only style commercials and three sonic

style commercials. The three visual-only style commercials and the three sonic style commercials were totally different ads, and not different versions of the same ad.

The program ran for a total time of 29 minutes, including the three commercial breaks, and each commercial break lasted for 2 minutes.

Each of the six commercials:

- Were commercials of countries other than the United States to control for brand familiarity.
- Were alternating to control for order effects. The sonic logo style and visual-only logo style ads alternated between first and last places in the commercial break with two filler commercials in between. There were 3 commercial breaks and each target commercial played in a different commercial break in each condition.
- Had approximately three seconds for logo display.
- Were 30-seconds long.

Each of the three commercial breaks ran for two minutes, and each break consisted of four 30-second commercials.

The third and final commercial break occurred five minutes before the end of the program, so that this last segment served as the distractor period. After watching the episode, participants were asked to do another study that served as distractor and increased the amount of time between when participants finish watching the program, and when they started the recall test. This other study lasted for 10 minutes.

Dependent Variables

The dependent variables being observed were *cued brand recall* and *brand recognition*. These are appropriate indicators to measure consumer awareness and assessment of initial learning in an advertising context (Moriarty, 1983 and Rossiter & Percy, 1983). It is also common to employ these tests sequentially in advertising research; with recognition the least difficult and cued recall more difficult (Singh & Rothschild, 1983). Both these measures have been widely researched.

Cued Brand Recall

The respondents, in this case were given a cue in the form of a one-sentence descriptor about the commercial they saw. Following the cue, participants were asked to think and identify which brand the commercial was for. Participants were given 30 seconds to identify the commercial. (Please see APPENDIX D) An example of one of the cues is, "You saw an ad where a guy refuses to talk to a woman due to the lack of a particular cell phone network. What was the name of the advertiser sponsoring the ad?"

Media Lab software randomly cued the commercial descriptors. Recall measures the extent to which an ad is remembered when elements of the brand are prompted (asiamarketresearch.com, 2006). Media Lab software collected the participants' responses to the cues.

Brand Recognition

For the purposes of this study, we used the Yes/No recognition test. We showed the participants a list of 12 brand names (flashed at random by Media Lab software) and they were asked if they saw a commercial for that brand (Please see APPENDIX

E). Six of those brand names were the targets, and the remaining six brand names were foils. The foil brands are those that did not appear in commercials during the program. The brand names were flashed for 500 milliseconds.

Participants were given three seconds to indicate whether or not they saw a commercial for that brand during the program. Participants were warned that the brand names would be presented at a quick rate and told that they should indicate their response before the next brand name came up. Responses to the recognition test were recorded on Media Lab software and coded as 'hits', 'misses', 'correct rejections' or 'false alarms'. Recognition was analyzed through use of signal detection analysis.

Signal detection Analysis. Two parameters of recognition performance were computed for a signal detection analysis: sensitivity and criterion bias (Fox, 2004; Macmillan & Creelman, 2004; Shapiro, 1994; Shapiro & Fox, 2002). This requires the computation of hit rates and the false alarm rates for respondents of the recognition test. A *hit* response is one in which a subject answers "yes" to the target brand. A *miss* response is one in which a subject answers "no" to the target brand. A *false alarm* occurs when a subject answers "yes" to a foil.

Sensitivity is computed as a ratio of hits to false alarms. It represents the strength of the memory trace. It takes into account the ability of the viewer to discriminate targets from foils. For instance, if subjects merely kept clicking the "Yes" button for both targets and foils, they would be 100% accurate for hits, even though they got all the foils wrong. It would appear that they got all the responses right but clearly; the viewer did not discriminate at all between targets and foils. If we didn't compute sensitivity, we might be deceived into concluding the respondent's recognition

was perfect. Sensitivity, increases as accuracy for hits increases and as inaccuracy for false alarms decreases.

The second parameter, criterion bias, indexes how liberal respondents were in their responses; how willing were they to guess. It is interpreted as an indicator of how confident a person decides to be when deciding on whether or not an item was previously seen. A higher (conservative) criterion means that there will be fewer false alarms, but also there will be more misses. On the other hand, if a person has a lower (liberal) criterion, there will be more hits, but there will also be more false alarms. The key point here is that a shift in criterion bias may be the reason for an observed difference in accuracy, and not necessarily better memory.

Nonparametric measures for sensitivity (A') and criterion bias (B") were used in this study (Pollack & Norman, 1964; Grier, 1971). The formulae for calculating A' and B" are as follows:

A' = 1/2 + [(H-F)(1+H-F)] / 4H(1-F), If H >= F
A' = 1/2 - [(F-H)(1+F-H)] / 4F(1-H), If H <= F

B" = [H(1-H) - F(1-F)] / [H(1-H) + F(1-F)], If H >= F
B" = [F(1-F) - H(1-H)] / [H(1-H) + F(1-F)], If H <= F

Here H = Hit rate, and F= False Alarm

Stimulus selection

The stimulus messages were 30-second television commercials selected from www.adforum.com. Adforum is a respected database of all recent commercials run in television stations around the United States and certain other countries in the world. The commercials chosen were produced between the years 2000 to 2005, so that the stimulus messages would be recent advertisements but not currently running on the air.

This meant the commercials used in this study reflected recent production practices but were not commercials that participants had seen recently and therefore did not have strong pre-existing attitudes toward.

Each 30-second commercial was for brands unknown in the US, to control for brand familiarity. Each commercial had approximately the same time for logo display.

Apparatus

The television commercials were embedded in an episode of *Friends* – Season 4, in digital format and were played on a television screen. The only apparatus that the participant used is a keyboard and mouse to answer the cued brand recall and recognition tests. Media Lab software program collected these self-report measures.

Participants and Procedure

Forty-nine students from the University of Missouri-Columbia were recruited for this experiment. Participants were recruited from an undergraduate journalism class. They were not paid any remuneration for taking part in the experiment. However the students got research participation credit. Each participant was assigned randomly to one of six conditions. Each participant completed the experiment one at a time in a psychophysiology laboratory.

Upon entering the laboratory, participants were greeted by the researcher, seated in a chair and asked to provide informed consent. The informed consent form stated that the purpose of the study was to learn how people respond to television. It also informed participants of the procedures. Participants were also informed that they would be watching a television program and be asked some questions. After informed consent was obtained, the experiment began with a 29 minute television program.

Twelve commercials (six targets and six foils) were embedded within three commercial breaks in the program. Each commercial break consisted of four 30-second commercials. Embedding the commercials in a television program made the environment more “real” to provide external validity.

After the program ended, the participant was given a distractor task in the form of another 10 minute study that they had to complete. This study involved reading three online news stories and answering a few questions about those stories. After the distractor task was completed the participant took the cued brand recall test.

In the cued recall test, the participant was given a descriptor for every target commercial that he/she has seen. The descriptor explained what the advertisement was about in one sentence. The participant would have to read it and name the brand corresponding to that commercial. The participant got 30 seconds for each descriptor. These descriptors were randomized by Media Lab software for each participant.

After the cued recall test, the participant took the recognition test. At the start of the recognition test, 12 brand names were flashed in text. The participants were asked if they saw a commercial for that brand. The 12 brand names included the three sonic logo style brands and the three visual-only logo style brands. The six foils were brands for which they didn’t see a commercial.

After completing the recognition test, participants were thanked and dismissed. A computer equipped with Media Lab software controlled the presentation of these self-report measures, and collected their responses. The entire experiment lasted for approximately one hour.

CHAPTER 4: RESULTS

Brand Recognition

Hypothesis 1 stated that brand recognition for a sonic-style logo would be greater than brand recognition for a visual-only style logo. We analyzed brand recognition through use of signal detection analysis. We first computed mean accuracy measures (hits and false alarms) for sonic style and visual-only style brands. This was done by averaging across sonic-style and visual-only style brands in the six conditions.

Table 1
Mean accuracy measures for Hits and False Alarms

	Mean
Mean Hit scores for sonic brands	0.45
Mean Hit scores for visual-only brands	0.43
Mean False Alarm scores for sonic brands	0.46
Mean False Alarm scores for visual-only brands	0.40

Note: N=49

Signal Detection Analysis is done by computing nonparametric measures for sensitivity (A') and criterion bias (B") for sonic-style commercials vs. visual-only style commercials using the formulae given earlier. Computing the mean accuracy scores tells us which formula to use while calculating A' and B". A paired samples t-test was first performed on the sensitivity data.

Table 2
Paired Samples T-Test between Mean Sensitivity scores of *Brands with sonic-style logos* and *Brands with visual-only style logos*

	Mean	Std. Deviation		
Sensitivity for Sonic-style logos	.40	.32		
Sensitivity for Visual-only style logos	.59	.32		
			T	**Sig. (2-tailed)**
Paired Sample Sensitivity between Sonic-style and Visual-only style logos			-2.06	$.04_a$

Note. [a]$p < 0.05$. Here N = 27, omitting those outliers whose false alarm rate and hit rate combined to give a zero in the denominator while computing A'.

Table 2 represents the mean measures for sensitivity for sonic-style logos and visual-only style logos. We reduced the *N* for sensitivity to 27 from the overall *N* of 49. This was due to the need to omit those respondents, who had a 'false alarm' rate of one or a 'hit' rate of zero in the computation of *Sensitivity score for sonic-style logos*, or a 'false alarm' rate of zero and a 'hit' rate of one in the computation of *Sensitivity score for visual-only style logos*, thereby making the denominator zero.

A paired samples t-test on the sensitivity data showed a significant difference in sensitivity between brands with visual-only style logos and brands with sonic-style logos as seen in Table 2. Sensitivity is higher for brands with a visual-only style logo than for brands with sonic-style logo.

A paired samples t-test was then performed on the criterion bias data.

Table 3
Paired Samples T-Test between mean Criterion Bias scores of *Brands with sonic-style logos* and *Brands with visual-only style logos*

	Mean	Std. Deviation		
Criterion Bias for Sonic-style logos	- .13	.69		
Criterion Bias for Visual-only style logos	.00	.60		
			T	**Sig. (2-tailed)**
Paired Sample Criterion Bias between Sonic-style and Visual-only style logos			- .842	$.405_a$

Note. [a]p > .05. Hence p is not significant. Here N = 40 omitting those outliers who's false alarm rate and hit rate combined to give a zero in the denominator while computing B".

Table 3 represents the mean measures for criterion bias for sonic-style logos and visual-only style logos respectively. The *N* for criterion bias was reduced to 40 from the overall *N* of 49. This was due to the need to omit those respondents, whose 'false alarm' rate and 'hit' rate combined to give a zero in the denominator during the computation of *Criterion Bias for sonic-style logos* and *Criterion Bias for visual-only style logos.*

A paired samples t-test on the criterion bias data showed no significant difference in criterion bias between brands with a visual-only style logo and brands with sonic style logo, as seen in Table 4.

We therefore reject Hypothesis 1. Brand recognition for sonic-style logos cannot be proved to be greater than brand recognition for visual-only style logos, because the sensitivity data showed higher sensitivity for brands without a sonic-style

logo. Also there wasn't a significant difference in Criterion bias between brands with a sonic-style logo and brands with a visual-only style logo.

Brand Recall

Hypothesis 2 stated that cued brand recall for a sonic-style logo would be less than cued brand recall for a visual-only style logo. Brand recall was analyzed through a paired samples t-test (Table 4). Recall for brands with Sonic-style logo and recall for brands with visual-only style logo were the two samples analyzed.

Table 4
Paired Samples T-Test between mean Recall scores of *Brands with sonic-style logos* and *Brands with visual-only style logos* s

	Mean	**Std. Deviation**		
Recall Score for Sonic-style brands	.23	.22		
Recall Score for Visual-only style brands	.21	.23		
			F	**Sig.**
Paired Sample Recall between Sonic-style and Visual-only style logos			0.253	0.617_a

Note. [a]p > .05. Hence p is not significant. Here N = 49.

As seen in Table 4, the paired samples t-test showed that there are no significant differences between recall scores for sonic and visual-only style brands. Hence Hypothesis 2 which stated that cued brand recall for sonic-style logos will be less than cued brand recall for sonic style logos can be rejected.

DISCUSSION

This study provides insight into the effect of a specific structural feature of commercials called sonic branding. Brand recognition was hypothesized to be greater for sonic-style commercials than for visual-only style commercials. The results of this study though suggest that recognition sensitivity is higher for visual-only style logos than for sonic-style logos. Visual-only style logos have a stronger memory trace than sonic style logos. There isn't a significant difference in recognition criterion bias between sonic-style logos and visual-only style logos.

Brand recall for sonic-style commercials was hypothesized to be less than visual-only style commercials. There isn't a significant difference between brand recall for sonic-style commercials and visual-only style commercials.

Practical Implications

Most brand managers seem to be convinced of the role of sonic branding in building brand equity (Hein, 2006). While this research only focuses on brand recognition and brand recall, it does suggest an alternative view - sonic branding may not be as effective as it is thought to be.

Advertising managers turn to sonic branding to increase recognition and recall of their brands (Jackson, 2004). While there have been numerous instances of brands deemed to have successful sonic brands by the media and the companies themselves, these successes have been established over a significant period of time through numerous repetitions over various campaigns.

When consumers see and hear a brand advertised for the first time, as was the case for the brands used in this study, it seems that having a sonic brand in a commercial wouldn't significantly impact recognition and recall. In fact as the results for recognition sensitivity prove, sonic branding seems to interfere with brand recognition. Having a visual-only style logo in a commercial seems more effective in increasing brand recognition.

But Intel, for instance, has a well-publicized sonic brand (Barnet, 2001). Yet we cannot completely relate greater recognition of Intel to the sonic brand, as other reasons like greater advertising repetition and virtual monopoly of Intel processors might have played a part in higher recognition. Can sonic branding be isolated as the cause for greater recognition? That was the purpose of using unfamiliar brands for this study. Most brands used in the study may make a better impact on recognition and recall if the frequency of the commercials were increased.

But the bottom line of this experiment is that the amount of research on sonic branding needs to increase before one can make a conclusive statement about the effectiveness or ineffectiveness of sonic branding. There needs to be greater proprietary research done by companies on their brands before they decide on creating a sonic-style logo for their brand.

Theoretical Implications

The mean false alarm scores (Table 1) were higher for sonic-style logos than for visual-only style logos, whereas the hit rates were somewhat similar. This explains why sensitivity for visual-only style logos was higher. In fact the recognition sensitivity results indicate that encoding is higher for visual-only style logos, which may offer

evidence that sonic branding may in fact be interfering with brand recognition. We'll need to do further research on whether sonic branding evokes an orienting response to offer a conclusive explanation. According to our hypothesis, sonic branding was perceived to increase the resources allocated to encoding by increasing attention through the elicitation of an orienting response. We assumed orienting because many audio structural features have been shown to elicit orienting responses including sound effects, voice changes (from one speaker to another), and music onsets (Potter et al., 1997). But sonic branding may not evoke an orienting response at all, which may explain why sensitivity was higher for visual-only style logos than sonic-style logos.

On the other hand, if sonic branding does indeed elicit an orienting response, it could mean that low recognition may be a result of unfamiliarity with the brands, since most of the commercials and brands used in the study were viewed by participants for the first time. Previous research has shown that the information presented immediately after an orienting eliciting structural feature is encoded better when the resource demands of the informational content are low and worse when the informational demands are high (Fox, Lang, Chung, Lee, & Potter, 2004; Thorson & Lang, 1992). Thus, when the message itself is unfamiliar, it requires more resources as the orienting response will interfere with processing of the message and decrease the encoding of the message. Since the commercials were for unfamiliar European brands, even if the sonic branding had evoked orienting responses, it explains why sonic-style logos had lower recognition.

People may need to have some familiarity with brands in order to retain some information about them. When a commercial begins, the viewer's mind is not

necessarily in tune to the topic of the commercial. When the commercial begins, the images and words activate links to previously stored information and the automatic retrieval of information needed to comprehend the message begins. Thus when initial information does not elicit appropriate background information, the processing task becomes much more difficult (A. Lang, Sias, Chantrill, & Burek, 1995). Storage as explained through the LC4MP theory is the linking of recently encoded information to previously stored information. The more links a new piece of information has to old information, the better it is stored. There wasn't any previously stored information on these brands in the minds of the respondents since they were being viewed for the first time. This may explain the lack of significant impact of sonic branding on recall.

The mean hit scores for both sonic-style logos and visual-only style logos were less than chance (i.e. probability < .5). This suggests that the brand names were probably just too difficult to remember.

The presence of the *Friends* episode may also have played a part as participants were cued to watch the program and not the commercials specifically. This may have reduced recall.

Limitations and Future Research

The conclusions drawn from this study are subject to some limitations. This study examined sonic branding only in the context of six brands. Resource and time limitations will make it difficult for researchers to perform a single experiment on vast numbers of sonic brands. But sonic branding offers huge scope for future research.

The first hypothesis was based on the assumption that sonic branding would evoke an orienting response. There has been no specific research on this particular

structural feature of commercials and it points to the need to test whether sonic branding evokes an orienting response.

This study tries to analyze the impact of sonic branding by using foreign brands whose commercials may not have been seen by Americans. The unfamiliarity of brands may have played a role in interfering with recognition and recall, and another direction for future research could be a comparison between recognition and recall scores for unfamiliar brands vs. more familiar brands.

This study doesn't test audio recognition and recall. Future research studies can isolate the sonic brands of commercials and test them for recall and recognition, and observe whether the results are similar to this study.

This study also tests recall and recognition after only one repetition of the target commercials. There is an avenue for future research by testing recall and recognition for sonic brands by increasing the frequency of each commercial to identify any differences between commercials watched less number of times and those watched more frequently.

The commercials and the *Friends* program in which they are embedded may not be a 'natural fit', from the media planning perspective. This is because of the relative difficulty of procuring commercials of unfamiliar foreign brands with sonic branding. Commercials that were targeted to a specific audience may not resonate with other audiences.

There will have to be a sonic boom of a different kind where researchers will need to establish a greater body of work on sonic branding before any judgment can be passed on sonic branding. This study though provides the initial knowledge concerning this under-researched phenomenon.

APPENDIX A

Consent Form

You are invited to participate in a research study conducted by Arun Venkataraman under the direction of Professor Paul Bolls from the School of Journalism at the University of Missouri-Columbia. We hope to better understand how viewers respond to media. The results from this study will help to contribute to our knowledge of how certain types of messages elicit particular responses.

If you decide to participate, you will view an episode of the TV sitcom "Friends." After you view the program you will be asked some questions. The entire study should take about one hour. Your decision whether to participate will not affect your current or future relations with the University of Missouri or the School of Journalism. Your participation in this study is voluntary, and you are free to withdraw at any time without affecting those relationships.

While you are participating, we will be recording your physiological responses. In order to do this we will place three sensors on your forearms and two sensors on your palm. Placing the sensors will involve wiping your palm with a paper towel that has been moistened with distilled water. We will also wipe your forearms with rubbing alcohol. The sensors have an adhesive collar and contain a water-soluble gel. The sensors will be placed directly on the surface of your skin and connected to physiological response recording equipment. As a result of having sensors directly applied to your skin, there is an extremely small chance that you could experience electrical shock. In order to minimize this risk the following precautions are being taken:

1. No participants are run during inclement weather.
2. All equipment is connected to GFI protected outlets
3. All safety guidelines for physiological data collection are strictly adhered to.

Placing sensors on your skin should in no way cause any physical discomfort. Please let the researcher know immediately if you experience any form of discomfort.

The data from this study will be kept confidential. The data you provide will receive a code number, so your name will in no way be connected with the responses you provide. Your participation will be noted, separately from your data, solely to inform your instructor of your participation. *Turn Page Over.*

All data collected for this research will be stored for three years after completion of research. The data will be stored on password-protected computers in a locked, secured lab.

You will not receive monetary payment for your participation. Participation in this study counts for one of the required research participation credits for Strategic Communication Research 1. Please give the receipt you will receive to your teaching assistant for this course and you will receive this credit. There are other studies announced in your class that also count for the course requirement that you may participate in if you choose not to participate in this study.

You may ask any questions you have now. If you have questions later, you may contact Professor Bolls at E-mail: bollsp@missouri.edu or Phone: 573-884-0170

If you have any questions or concerns regarding the study and would like to talk to someone other than the researcher(s), contact MU Campus Institutional Review Board located in 483 McReynolds Hall, phone number (573)882-9585.

I have read the above information. Any questions I may have raised have been answered. By signing this consent form I am stating that I am at least 18 years of age, and that I consent to participate in the study.

Signature of participant _____

Print Name_____

Date _____

APPENDIX B

Recruitment Script for participating in Sonic Branding experiment

We are conducting an experiment where you will watch an episode of *FRIENDS* and answer some questions that tell us about how you respond to television. A few sensors will be placed on your hands and face while watching the program and this process is safe. The questions are quick and easy to answer. Your participation in this experiment will take approximately one hour. We are passing a sign-up sheet that has the slots, the time and the place of the experiment listed. The experiment will be conducted at the Prime Lab – 178 Gannett.

If you choose to participate in the experiment, just have a look at the time-slots that are appropriate for you, and put in your name and email id. Just to make sure that you do not forget, we'll send you a reminder through email a day before you are scheduled to run.

If you have any questions regarding this study, please contact
Arun Venkataraman at akvwd6@mizzou.edu

APPENDIX C

Sonic Branding and Surf/Search Online News Protocol

BEFORE PARTICIPANT ARRIVES:

PHYSIO STUFF:

1. Make sure Coulbourn Instruments stack, VPM computer and media lab computer are turned on. Power for Coulbourn stack is located rear lower left side of base.

PLEASE MAKE NOTE OF NEW PROCEDURES FOR SENSOR PLACEMENT. SEE NOTES ON WALL IN EXPERIMENTER ROOM. ALSO NOTE THAT WE ARE NOW GROUNDING EMG CHANNELS SO YOU WILL NEED 3 MINI SENSORS FOR EACH CHANNEL.

2. Prep sensors. You will need:
    a. 3 standard sensors for Heart Rate (HR)
    b. 2 standard sensors for Skin Conductance (SC)
    c. 3 mini sensors for Corrugator EMG

3. REMEMBER: KY GEL (CLEAR) GOES IN SKIN CONDUCTANCE SENSORS…ALL OTHER SENSORS USE ELECTRODE GEL (GREENISH)

COMPUTER/MEDIA STUFF:

4. Open the following .mov file.
    a. If you need to log into the Media Lab Computer, log in as Johnny Bravo. The password is BravoJohnny
    b. Open Windows Explorer
    c. Depending on the condition, select the following file: *E:/MediaLab/SonicBranding/(Condition1/2/3/4/5/6).mov*

NOTE: *(Make sure to hit "Ctrl F" to increase the viewer to "Full Screen size")*

5. Start the VPM data collection program.
    - Make sure you are at the C:\VPM prompt. If not, get there by typing "cd vpm" and hit enter.
    - At the vpm prompt type "*vpm sonic*" and hit enter.
    - Enter the specification file "*defsonic.vpm*" and hit enter.

- Enter the subject ID for the participant you are running and hit enter

6. Put consent forms on clipboard for participant to sign.

ONCE PARTICIPANT ARRIVES:

1. Welcome participant and give them blank informed consent forms to read and sign. You'll find blank forms in the form holder that says "Blank Consent Forms" on back wall of experimenter room. **Make sure they sign both studies' consent forms.**

2. Place signed consent forms in the file that says *"Completed Consent Forms"* which is also on back wall of experimenter room.

3. Perform adjustment for skin conductance. Basically this just means look at the value underneath Channel 2 on the VPM monitor. That value should be flickering between -2047 and -2048. If the value on the screen it is not flickering between those numbers, toggle the *"Balance Control"* knob on the Skin Conductance Coupler (Physio Rack) until it does. Refer to sign on wall that says "Adjusting for Skin Conductance".

4. Take sensors into participant room.

"NOW I'M GOING TO CONNECT SOME SENSORS TO YOUR HANDS, ARMS, AND FACE. THIS WILL ALLOW US TO GET SOME DIFFERENT INFORMATION THAT WILL HELP WITH THIS RESEARCH. AT THE END OF THE EXPERIMENT I'LL BE HAPPY TO TELL YOU MORE ABOUT WHAT THESE SENSORS ARE MEASURING. FOR NOW, THE FIRST THING I'M GOING TO DO IS PREPARE YOUR SKIN BY WIPING IT WITH SOME WATER/ALCOHOL PADS."

5. Have participant remove rings and/or dangly earrings that could interfere with sensors.

6. Prep participant's skin. **REMEMBER TO USE WATER ON PALMS OF HANDS (SC) AND ALCHOL PADS EVERYWHERE ELSE.**

NOTE: AS YOU'RE PREPARING/ATTACHING SENSORS, REMEMBER TO DO YOUR BEST TO MAKE THE PARTICIPANT AS COMFORTABLE AS POSSIBLE. MAKE SMALL TALK AND NEVER USE THE WORDS "ELECTRODE" "VOLTAGE" "CURRENT" OR "GROUND"

NOTE2: BAD SKIN PREPARATION AND BAD SENSOR PLACEMENT LEAD TO BAD DATA. TAKE YOUR TIME AND PAY ATTENTION TO DETAIL. CONSULT THE PICTURES IN THE CONTROL ROOM IF NECESSARY

7. Prep participant's skin for facial EMG sensors.

REMEMBER TO USE WATER ON PALMS OF HANDS (SC) AND ALCHOL PADS EVERYWHERE ELSE.

8. Attach facial EMG sensors but do not plug them in.

9. Prep participant's skin for HR/SCR sensors.

10. Attach HR/SCR sensors.

11. Check impedance for facial EMG sensors. Refer to sign on left wall in control room that says "Adjusting Facial EMG".

12. If impedance is acceptable, plug sensors in, starting with HR ground (sensor on non-dominant wrist). Tape off sensor wires if necessary.

"OKAY, THAT'S THE HARDEST PART OF THE ENTIRE EXPERIMENT. DO YOU FEEL OKAY? ARE YOU COMFORTABLE? WHILE YOU HAVE THESE SENSORS ON, PLEASE TRY TO SIT RELATIVELY STILL AND PLEASE AVOID MAKING SUDDEN MOVEMENTS AS THIS WILL RESULT IN UNUSABLE DATA. IF AT ANY POINT OF THE EXPERIMENT YOU EXPERIENCE ANY DISCOMFORT OR HAVE ANY CONCERNS, PLEASE LET ME KNOW IMMEDIATELY. I'M GOING TO GO BACK TO MAKE SURE ALL THE SIGNALS ARE COMING IN CLEARLY. THIS MIGHT TAKE A COUPLE OF MINUTES SO JUST RELAX. ONCE I'M FINISHED, I'LL COME BACK IN HERE AND GET YOU STARTED WITH THE NEXT PART OF THE EXPERIMENT."

13. Check heart rate waveform and make sure you are reliably picking up HR in the "last event" window of the VPM monitor. (Normal HR in range of 600 – 1200). If you're not picking up a good HR signal, take steps outlined in sign on wall under "Adjusting HR"

14. Return to participant room.

"OKAY, EVERYTHING LOOKS GOOD. AS I SAID BEFORE, ONE OF THE THINGS WE'RE DOING TODAY IS UNDERSTANDING RESPONSES TO TELEVISION. NOW YOU ARE GOING TO WATCH AN EPISODE OF "FRIENDS". ONCE THE EPISODE IS OVER, I'LL COME BACK AND WE'LL MOVE ON TO THE NEXT PART OF THE EXPERIMENT. DO YOU HAVE ANY QUESTIONS? IF NOT, WAIT UNTIL I LEAVE THE ROOM AND YOU MAY BEGIN."

15. Leave room and let participant watch the "Friends" episode.

16. VERY VERY IMPORTANT! Make sure to hit the "Right SHIFT" key on the VPM computer at the start and end of every sonic brand commercial. Please refer to the "SONIC AD RUNSHEET" to know which commercials are sonic brand commercials.

PLEASE MAKE A NOTE OF ANYTHING OUT OF THE ORDINARY IN EXPERIMENT LOG, WHICH IS A WHITE BINDER.

AFTER THEY WATCH "FRIENDS":

AS I SAID BEFORE, WE'RE ALSO TESTING RESPONSES TO A NEW ONLINE NEWS FORMAT. NOW YOU'RE GOING TO READ A FEW NEWS STORIES ON THE COMPUTER. JUST FOLLOW THE INSTRUCTIONS ON THE SCREEN UNTIL YOU'VE FINISHED READING AND ANSWERING QUESTIONS FOR EACH STORY. AT THAT POINT, I'LL COME BACK IN AND WE'LL MOVE ON TO THE NEXT PART OF THE EXPERIMENT. THE COMPUTER WILL ALSO GIVE YOU INSTRUCTIONS AS YOU MOVE ALONG. DO YOU HAVE ANY QUESTIONS? IF NOT, WAIT UNTIL I LEAVE THE ROOM AND YOU MAY BEGIN."

NOTE: MAKE SURE TO TELL PARTICIPANT TO CLICK THE "CONTINUE" ON THE BOTTOM OF THE COMPUTER MONITOR, NOT THE "CONTINUE" THAT APPEARS IN THE NEWS STORY.

1. Leave room and ask participant to wait for the experiment to come on screen before starting Search/Surf study.

2. Start the Media Lab computer program.
    a. If you need to log into the Media Lab Computer, log in as Johnny Bravo. The password is BravoJohnny
    b. Open Media Lab
    c. Select "Run" from the pull-down menu
    d. Click "Select and Run an Experiment"
    e. Select the following file: *E:/MediaLab/SearchSurfFU/ss.exp*
    f. Enter the appropriate Subject ID and Condition, which you will find on a chart on the wall to the left of the MediaLab computer.

NOTE: THE SUBJECT ID NUMBERS WILL NOT BE THE SAME BETWEEN THE TWO STUDIES. MAKE SURE TO CHECK THE CHART ON THE WALL SO THAT YOU USE THE CORRECT SUBJECT ID NUMBER FOR THE SURF/SEARCH STUDY.

3. Start the VPM data collection program.

- Make sure you are at the C:\VPM prompt. If not, get there by typing "cd vpm" and hit enter.
- At the vpm prompt type "*vpm search*" and hit enter.
- Enter the specification file "*defsearch.vpm*" and hit enter.
- Enter the subject ID for the participant you are running and hit enter

REMEMBER TO CLICK RT-SHIFT AT THE MOMENT THAT EACH SUBJECT CLICKS ON A HEADLINE AND BEGINS READING A STORY. ALSO BE SURE TO MARK THE APPROPRIATE STORY NUMBER ON THE GRID, AND BEGIN TO PUT TOGETHER RECOGNITION PACKET.

PLEASE MAKE A NOTE OF ANYTHING OUT OF THE ORDINARY IN EXPERIMENT LOG, WHICH IS A WHITE BINDER THAT SAYS, "SEARCH/SURF AND AWARD STUDY" ON IT.

AFTER SEARCH/SURF STUDY:

"NOW I'M GOING TO REMOVE THE SENSORS FROM YOUR SKIN. AS I REMOVE THEM, YOU MIGHT NOTICE THAT THERE IS SOME GEL LEFT ON YOUR SKIN FROM THE SENSOR. AS SOON AS I'M DONE REMOVING ALL THE SENSORS I WILL GIVE YOU SOME PAPER TOWELS TO WIPE YOURSELF OFF WITH."

1. Unplug and remove sensors. REMEMBER TO UNPLUG GROUND SENSOR LAST. Dampen paper towel with distilled water and give to participant to wipe himself/herself off. Make sure that trash can is accessible.

2. Take dirty sensors back to experimenter room.

START OF SONIC BRANDING RECOGNITION TEST:

3. Start new MediaLab Program:
   - Open Media Lab
   - Select "Run" from pull-down menu
   - Click "Select and Run an Experiment"
   - Select the following file for Recall test: *E:/MediaLab/Sonic Branding /recog_que.exp*

4. Enter the appropriate Subject ID and Condition **FOR SONIC BRANDING STUDY**. You can find this information on a chart on the wall to the left of the MediaLab computer.

"OKAY, NOW YOU'RE GOING TO ANSWER SOME QUESTIONS ABOUT THE ADVERTISEMENTS YOU SAW DURING THE EPISODE OF "FRIENDS." JUST

FOLLOW THE INSTRUCTIONS ON THE SCREEN. ONCE I LEAVE THE ROOM YOU MAY BEGIN."

5. **Return to experimenter room and let participant take the SONIC BRANDING Recall test.**

NOTE: WHILE PARTICIPANT IS DOING SONIC BRANDING RECALL/RECOGNITION TESTS, MAKE SURE THAT YOU CREATE SEARCH/SURF RECOGNITION TEST.

AFTER SONIC BRANDING RECALL TEST: (START RECOGNITION TEST)

1) Start new MediaLab Program:
   - Open Media Lab
   - Select "Run" from pull-down menu
   - Click "Select and Run an Experiment"
   - Select the following file for Recognition test: *E:/MediaLab/Sonic Branding /recall.exp*

   Enter the appropriate Subject ID and Condition **FOR SONIC BRANDING STUDY**. You can find this information on a chart on the wall to the left of the MediaLab computer.

"OKAY, NOW SOME BRAND NAMES ARE GOING TO BE FLASHED AT YOU AND YOU HAVE TO ANSWER "YES/NO" TO WHETHER YOU SAW AN AD FOR THAT BRAND DURING THE EPISODE OF "FRIENDS". THESE BRAND NAMES WILL BE FLASHED AT YOU RAPIDLY AND YOU'LL GET JUST A FEW SECONDS TO ANSWER "YES/NO". JUST FOLLOW THE INSTRUCTIONS ON THE SCREEN. OKAY, ONCE I LEAVE THE ROOM YOU MAY BEGIN."

2. **Conduct SONIC BRANDING recognition test.**

AFTER SONIC BRANDING RECOGNITION TEST: (START SURF/SEARCH RECOGNITION TEST)

6. Return to participant room and give packet to subject for surf/search recognition test.

"OKAY, NOW YOU'RE GOING TO ANSWER SOME QUESTIONS ABOUT THE STORIES YOU READ EARLIER IN THE EXPERIMENT. JUST FOLLOW THE INSTRUCTIONS ON THE SCREEN. OKAY, ONCE I LEAVE THE ROOM YOU MAY BEGIN."

7. Return to experimenter room and let participant take recognition test.

AFTER SEARCH/SURF RECOGNITION TEST:

1. Give receipt to subject.
2. Debrief subject.

"BEFORE YOU GO, I CAN TELL YOU A LITTLE BIT MORE ABOUT WHAT THIS RESEARCH IS ALL ABOUT. WHEN YOU WERE READING THE ONLINE NEWS STORIES, WE WERE MONITORING YOUR HEART RATE, WHICH GIVES US SOME IDEA OF HOW MUCH ATTENTION YOU WERE PAYING TO THE STORIES. WE DID THE SAME THING WHILE YOU WERE WATCHING THE TV COMMERCIALS. WE ALSO MONITORED YOUR SKIN CONDUCTANCE, WHICH TELLS US A LITTLE BIT ABOUT HOW ENGAGED YOU ARE IN THE STORIES AND COMMERCIALS. WE ALSO MONITORED THE ACTIVATION OF YOUR FACIAL MUSCLES, WHICH TELLS US WHETHER YOU FOUND THE EXPERIENCE PLEASANT OR UNPLEASANT. FINALLY, WE WERE INTERESTED IN HOW WELL YOU COULD RECOGNIZE INFORMATION FROM CERTAIN COMMERCIALS AND STORIES. IS THERE ANYTHING ELSE YOU'D LIKE TO KNOW? WELL, THANKS SO MUCH FOR YOUR TIME-WE REALLY APPRECIATE IT. YOU'RE FREE TO GO."

3. Make sure that participant has all personal belongings, especially if they had to take off any jewelry at the start of the study.

4. Once participant has left, clean/rinse/hang sensors.

5. If you have run the last participant of the day, shut off Coulbourn (physio) stack in control room and TV/monitor in participant room. Make sure all lights are turned off and all doors are locked.

APPENDIX D

The Recall Test

You will now be asked to read a short description of several of the ads you viewed during the "Friends" episode. Please read each sentence carefully, try to recall the ad and type the name of the advertiser that sponsored the ad in the space provided.

Q) You viewed an ad where a guy in an office encourages a co-worker when the vending machine gets stuck. What was the name of the advertiser sponsoring this ad?
Answer: BC Lions

Q) You viewed an ad where a guy explains how to make an impact while establishing a character. What was the name of the advertiser sponsoring this ad?
Answer: Worldwide Short Film festival

Q) You viewed an ad where a guy refuses to talk to a woman due to the lack of a particular cell phone network. What was the name of the advertiser sponsoring this ad?
Answer: Itineris

Q) You viewed an ad where a guy is always following around another guy. What was the name of the advertiser sponsoring this ad?
Answer: Telfort

Q) You viewed an ad where a guy is dejected because he lost a lot of money, and another guy consoles him. What was the name of the advertiser sponsoring this ad?
Answer: Systracom

Q) You viewed an ad where a group of power cords talk about electronic appliances available at a particular store. What was the name of the advertiser sponsoring this ad?
Answer: Euronics

APPENDIX E

The Recognition Test

In this part of the experiment, we're interested in how well you can recognize the names of some of the brands advertised during the "Friends" episode you watched earlier. The name of a brand will appear on the screen for a few seconds and you will be asked if you saw a commercial for this brand earlier. If you saw a commercial for the brand, point and click in the box marked "Yes". If you did not see a commercial for the brand, point and click in the box marked "No". We are also interested in how quickly you can decide whether or not you saw the brand advertised earlier, so please answer as quickly as possible.

(Following brand names to be flashed at random)

Targets	*Foils*
Itineris	Cable & Wireless
Worldwide Short Film Festival	Sundance Film Festival
Systracom	Infosys
BC Lions	Detroit Lions
Euronics	Altec Lansing
Telfort	Orange Mobile

APPENDIX F

Sonic Brand Ad RUNSHEET

The following are the list of sonic brand commercials in each condition.
Please press **"Right SHIFT"** at the **start** and **end** of each sonic brand commercial.

There are three commercial breaks in each condition. Each of these commercial breaks has four ads, but only one of them is a sonic brand commercial. So there are a total of **THREE** sonic brand commercials in each condition.

Condition 1	**Condition 2**	**Condition 3**	**Condition 4**	**Condition 5**	**Condition 6**
Break 1 **4th ad:** Worldwide Short Film	Break 1 **1st ad:** Systracom	Break 1 **1st ad:** BC Lions	Break 1 **4th ad:** Telfort	Break 1 **1st ad:** Euronics	Break 1 **4th ad:** Itineris
Break 2 **1st Ad:** Euronics	Break 2 **4th ad:** BC Lions	Break 2 **1st ad:** Itineris	Break 2 **4th ad:** Systracom	Break 2 **4th ad:** Worldwide Short Film	Break 2 **1st ad:** Telfort
Break 3 **1st Ad:** Telfort	Break 3 **4th ad:** Itineris	Break 3 **4th ad:** Euronics	Break 3 **1st ad:** Worldwide Short Film	Break 3 **1st ad:** Systracom	Break 3 **4th ad:** BC Lions

BREAK 1 starts after 6 minutes 54 seconds.

BREAK 2 starts after 13 minutes 43 seconds.

BREAK 3 starts after 20 minutes 57 seconds.

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