

THE EFFECTS OF INCONGRUITY, PRODUCTION PACING, AND SENSATION
SEEKING ON TV ADVERTISEMENTS

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ABSTRACT

This study addresses an important area of research that has fascinated advertising professionals who are eager to make more attractive ads: understanding how the viewing audience perceives and processes television advertisements. Ad incongruity, the introduction of unexpected elements that are atypical of a given ad category, and production pacing were tested to explore the roles of these stimuli in capturing higher levels of arousal, which can produce both better evaluations and clearer memories of ads.

Sixty subjects, who were recruited from among undergraduate students at Cornell University and patrons of a local shopping mall, participated in an experiment in which a set of TV ads was shown. Participants then answered questions immediately following exposure to the ads, providing data pertaining to sensation seeking, ad evaluation, arousal, and memory. The ads themselves represented six different conditions: incongruent and slow paced, incongruent and medium paced, incongruent and fast paced, congruent and slow paced, congruent and medium paced, and congruent and fast paced.

The main findings involved Lang's limited capacity model. It was found that the mental capacity or cognitive load required to process incongruent fast-paced ads exceeded study participants' cognitive capacity to process the information in such ads. When ads with both fast paced and incongruent elements were shown, participant's memory for that particular kind of ads declined. The study provided confirmation of Lang's (2000) limited capacity model.

The study's contributions include a key finding pertaining to incongruity effects that should help to resolve discrepancies in the literature on incongruity.

As expected, incongruent ads were evaluated more positively, and were more arousing and better remembered than congruent ads. Production pacing also had some effect on participants. As pacing increased, participants remembered better and ad evaluations tended to be more positive. However, ad type had a significant influence on the processing of ads. Car ads were evaluated more positively, were more arousing, and were better remembered than over-the-counter drug ads. There were no significant relationships between sensation seeking and incongruity or sensation seeking and production pacing.

BIOGRAPHICAL SKETCH

Hyo J Pak is a Master's student in the Department of Communication at Cornell University. She was admitted to the Master's program in fall 2005.

Before coming to Cornell University, Hyo J Pak graduated from the University of Michigan-Ann Arbor, majoring in psychology and communication.

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CHAPTER ONE

Introduction

Consumers are bombarded daily with advertisements in a cluttered media environment. Advertisers are eager to make ads that appeal to consumers since the key to success in advertising is making ads that draw viewers' attention more effectively and are therefore remembered better and evaluated more positively. Advertisers increasingly use *ad incongruity*, the introduction of unexpected elements that defy the conventional schema for a particular type of ad or advertised product, to command viewer attention. Incongruent ads are thought to be more extensively processed and more positively evaluated by viewers, yet research on ad incongruity shows mixed results regarding its effectiveness. Not all research supports the effectiveness of incongruity over congruity. Perhaps incongruity interacts with a personality characteristic like *sensation seeking*.

Production pacing, typically measured in terms of scene cuts and edits, may be another valuable concept in understanding the process of capturing consumer attention. Lang (2000) found that both structural features, such as pacing, and arousing media content influenced individuals in processing messages. The present study examines the influence of incongruity, pacing, and sensation seeking on viewers' memory and positive evaluation of commercial ads.

When both variables, incongruence and production pacing, are combined in advertising, a phenomenon known as *cognitive overload* is expected, resulting in an interaction effect between incongruity and production pacing. According to Lang (2000), cognitive overload occurs when the overall cognitive load (the effort required in working memory to process a set of stimuli) imposed by messages is greater than the viewer's total capacity to process those stimuli. To explore this possible interaction between incongruity and production pacing, both stimuli will be studied together to

test whether the results of using both as stimuli in ads would be more effective than using it separately. It is particularly important to investigate whether using both stimuli, incongruity and production pacing in the same ad is more effective than using one at a time, in terms of eliciting more positive evaluations and better memories of ads, because very little research has addressed their possible interaction. If using both stimuli in the same ad leads to a deterioration of memory on participants, we can conclude that cognitive overload has occurred, with a negative effect on ad memory. Tests will also determine whether levels of evaluation, recognition, and arousal measured in high sensation seekers are significantly different from those of low sensation seekers.

CHAPTER TWO

An Overview of the Incongruity Literature

Incongruity is the extent to which structural correspondence is not achieved between the entire configuration of attribute relations associated with an object and the configuration specified by a particular *schema* that is associated with that object (Meyers-Levy & Tybout, 1989). A schema is defined as a knowledge structure or semantic network structure regarding an object that serves as a frame of reference in forming judgments about that object (Bobrow & Norman, 1975). According to Lee and Schumann (2004), incongruity in advertising is a mismatch between a stimulus element (e.g. product, brand, endorser, music, or any execution element in an ad) and the existing schema within which one perceives the advertising stimulus. Schema incongruity can occur when the representation of an object does not match the configuration of an activated schema (Mandler, 1982). The level or intensity of such incongruity can be determined by the degree of mismatch between the representation of an object and the related schema (Meyers-Levy & Tybout, 1989; Sujana, 1985).

According to Mandler (1982), whenever the analysis of an event fits an existing structural description (a schema), the stage is set for a primitive positive evaluation. When no correspondence between schema and event is achieved, further mental activity will determine whether a positive or negative evaluation will follow. More complex mental activity is required in the case of incongruity. Mandler theorizes that encountering a stimulus that conforms to expectations (i.e., congruity) is not arousing. By contrast, the disruption of expectations that occurs when incongruity is encountered prompts arousal and cognitive elaboration directed toward making sense of the incongruity. Mandler (1982) proposed a schema incongruity theory that entails four types of incongruity processing, *assimilation*, *alternative schema*, *successful*

accommodation, and *unsuccessful accommodation*, all dealing with varying levels of incongruity. Assimilation and unsuccessful accommodation represent the extremes of a continuum from complete congruity to extreme incongruity.

Assimilation is most likely to occur with respect to a relatively weak level of incongruity that can be easily incorporated into an existing schema. Emotional intensity depends on how great a discrepancy (or incongruity) exists between what is encountered and what was expected. Assimilation results in relatively little arousal and therefore with assimilation a low degree of affective intensity is expected. If an existing schema can incorporate new information without any major structural changes, Mandler (1982) expects little disruption and usually a positive evaluative state. In the case of assimilation, judgments of positive value that are only slightly emotionally tinged are therefore expected. Slightly incongruous events are usually interesting and positively valued. Among the examples that Mandler provided are discoveries of generalizability of previous knowledge (“that’s another kind of good cake”; “I guess I can use the new variation of my old chess opening”). Meyers-Levy and Tybout (1989) provide another good example. When consumers of soft drinks are told that they have been given a new drink that has moderate fruit concentration and yet tastes very similar to soft drinks with which they are already familiar, they will think that it is just another soft drink. In that case, little naturally occurring curiosity would result in further consumer thought about the classification of the drink (Mandler, 1982; Meyers-Levy & Tybout, 1989).

When moderate incongruity is encountered assimilation may still occur, but when severe incongruity is encountered some form of accommodation is the more likely outcome. An alternative schema uses analogical reasoning that can utilize other schemas in resolving incongruities by detecting similarities between the existing schema and an incongruent representation. Forming new connections or transferring

prior knowledge appears to help resolve incongruity. In this situation incongruity occurs, but instead of undergoing major structural changes in processing stimuli, the solution is to find a different schema that fits the available evidence. In the simplest case this may be considered delayed congruity, but the initial discrepancy has already initiated the course of arousal, and the newly found congruity occurs within that context.

When an individual is confronted with severe incongruity that cannot be resolved by transferring prior knowledge, a new schema is required and accommodation may then occur (Lee & Shuman 2004). Accommodation is achieved by building a new associative link between existing schemas that were not previously connected. Successful accommodation occurs when a different schema that fits the available evidence is found, or when individuals who can form subtypes—*subtyping* is the process of filtering out incongruity and encoding it as a special case—use that skill to resolve the incongruity (Mandler, 1982). Accommodation based on changes in the schematic structure is determined by the evidence in the viewer's environment. If the accommodation is successful, the evaluative state may be positive or negative, depending on the relation between the newly accommodated structure and the environmental evidence. In that case, the viewer's state of affect will be intense. If the accommodation is unsuccessful, if the system cannot adapt to the new circumstances, then the evaluative sign will most probably be negative. Unsuccessful accommodation occurs when one fails to resolve the incongruity even after attempting to make substantial changes to one's current schematic structures. Mandler claimed that the degree to which an incongruity is resolved within a cognitive schema determines the affective response. A negative evaluation is the likely consequence of unsuccessful accommodation due to a severe incongruity that one cannot resolve. It is even possible that anxiety will follow the lack an appropriate response to such environmental stimuli.

Figure 1 shows all the possible outcomes of schema congruity and incongruity in terms of both values and affective intensity.

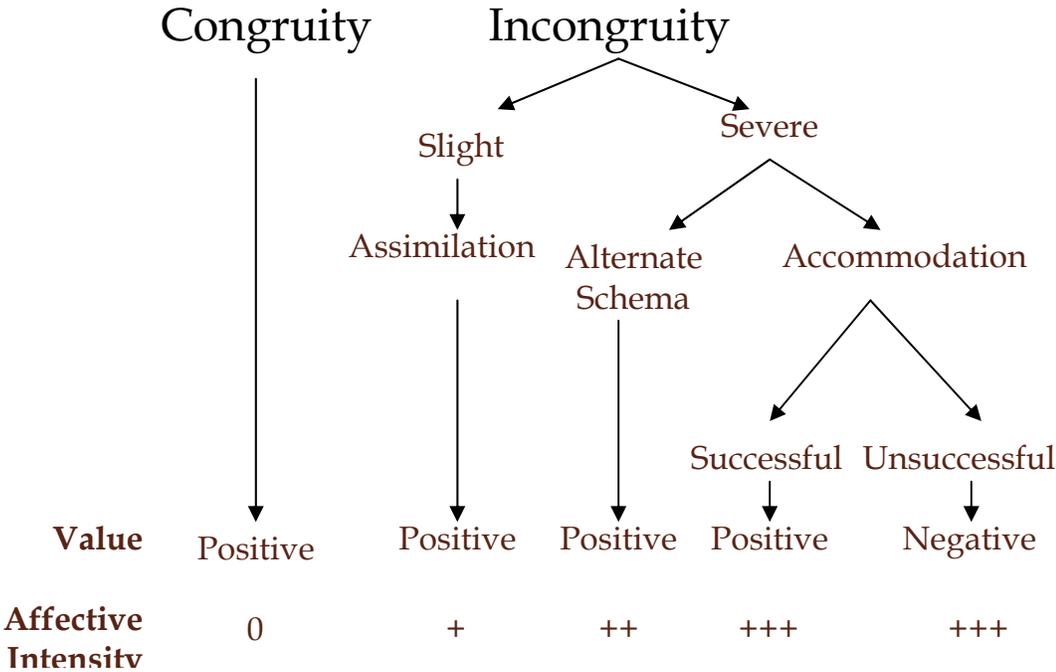


Figure 1. Mandler's Incongruence Theory

Mandler also theorized that moderate incongruities are regarded as “interesting and positively valued” (Mandler 1982, p. 22), thereby leading to more positive responses than those elicited by schema congruity. He reasoned that the heightened arousal and cognitive effort exerted to resolve an incongruity between a schema and an object allow individuals to evaluate incongruity in a more systematic way. Whether individuals can satisfactorily resolve such an incongruity will determine the valence of one's evaluation. Mandler predicted that the process of responding to moderate incongruity would lead to a more positive evaluation of the stimuli than would the process of responding to either congruity or extreme incongruity.

People tend to seek resolution when they encounter incongruity. A key

explanation of the effectiveness of incongruity is therefore based on its potential to create tension (Heider, 1958), which prompts them to undertake more detailed processing of stimuli. According to Latour and Tanner (2003), tension is a type of arousal, a potential psychophysiological response to incongruent stimuli that leads to more deliberate processing of input information. They suggested that tension aroused by incongruity has the potential to draw out a human need or desire to relieve such tension through increased cognitive effort. Among the means used to resolve this tension is, then, systematic mental processing. As Mandler pointed out, many studies also report that incongruity enhances the effectiveness of ads because it catches people's attention more effectively than congruity and has the potential to result in a positive evaluation as long as the incongruity is moderate.

Incongruity and Evaluation

While many studies support Mandler's incongruence theory, some have shown the opposite results regarding the effectiveness of incongruity when compared with congruity. A thorough review of studies examining incongruity in the advertising and consumer behavior literature reveals mixed results for the positive evaluation of incongruent ads. For example, one stream of research has found that congruent messages generate more favorable responses than incongruent ones (e.g. Kahle & Homer, 1985; Kamins, 1990; Kamins & Gupta, 1994; Misra & Beatty, 1990). Kamins and Gupta (1994) supported a more positive effect of congruity by testing a match-up hypothesis between celebrities and product advertising. Their findings indicated that the physical attractiveness of a celebrity endorser may enhance the product and ad-based evaluations only if the product's characteristics match up with the image conveyed by the celebrity. In other words, both the product's characteristics and the product images must be congruent in order to be evaluated more highly (Kamins &

Gupta, 1994). Another study, undertaken by Meyers-Levy and Tybout (1989), found that when attributes of a new product are moderately incongruent with the expectations evoked by the category to which it belongs, which in the case of this study was soft drinks, the new product was evaluated more favorably than when the attributes were either congruent or extremely incongruent with the category. In this study the all-natural soft drink was judged more favorably than either a “high-preservative” soft drink or an all-natural, sweetened carbonated beverage. For this study, based on Mandler’s incongruence theory, the following hypothesis will be tested.

1a *Hypothesis*: Slightly incongruent ads will be evaluated more positively than congruent ads.

Incongruity and Memory

Studies on incongruity and memory have brought mixed results. Several experiments have demonstrated that congruent information was recalled more frequently and rapidly (Barsalou, 1982; Nedungadi & Hutchinson, 1985), recognized better (Hastie & Kumar, 1979), and retained for a longer time (Sengupta, Goodstein, & Boninger, 1997) than incongruent information. Hahle and Homer (1985) examined congruity between the physical attractiveness of celebrities and advertised products. In an advertisement for disposable razors they manipulated celebrity-source physical attractiveness, likeability, and participants’ product involvement. Results showed that attitudes and purchase intention increased significantly in line with higher levels of celebrity source attractiveness. They also found that spokesperson-brand congruence resulted in higher levels of brand information recall than did incongruence. A positive transfer of affect from spokesperson to brand happened only under the congruent condition.

A study by Keckler and Childers (1992) produced opposite results with respect to incongruity and memory: They found a more pronounced effect of incongruity in their study using ads. To test the effectiveness of incongruity they measured memory and found that unexpected information was recalled better and was encoded in greater detail than congruent information, and that greater cognitive effort was found in processing unexpected rather than expected information. Their study showed that when information relevant to an ad's message is present in prior knowledge structures, little mental effort is required to process the information.

Another line of research that supports the incongruity effect was pursued by Goodstein (1993), who found that ads typical of an evoked schema elicited relatively less extensive cognitive processing, while those atypical of the schema elicited more extensive cognitive processing. Incongruity in Goodstein's study was defined as a stimulus that was discrepant from product category expectations. Goodstein also found that subjects recognized ad claims better when exposed to atypical ads as opposed to typical ads. Meyers-Levy and Tybout (1989) tested the effects of providing product attribute information to consumers that was either entirely congruent or partially incongruent with an activated schema. In the context of soft drinks, partial schema incongruity was achieved by including descriptive information on an attribute, "all natural," not normally associated with soft drinks. They found that schema inconsistency stimulated more cognitive processing and improved memory when compared with schema consistency. The following hypothesis will be tested.

1b. *Hypothesis*: Sensitivity (memory strength) about incongruent information will be stronger than sensitivity about congruent information.

The differences cited in previous studies may be resolved through theoretical examination of both the time at which an advertising stimulus containing incongruity

is likely to receive full attention leading to detailed processing, and the way in which ad incongruity is successfully resolved. We must examine incongruity more carefully and define it more systematically to obtain consistently robust results. A possible explanation regarding the various discrepancies noted thus far was suggested by Srull (1981). He tried to resolve this discrepancy by arguing that the nature of the memory task involved in processing ads-based stimuli might be such that it is difficult to determine whether congruent or incongruent information is better remembered. In a recall task where information is retrieved from the storage process, incongruent information is remembered better because the greater number of associative paths enhances retrieval. In a recognition task where encoding is a key to success, however, Srull insisted that the retrieval process might be bypassed. When congruent information is presented, it is linked to expectancies at the prototypical level, thus allowing for easier recognition. Srull points out in addition that virtually all of the studies finding greater memory for congruent information involved a recognition task.

This difference could be resolved through a careful examination of a memory task such as the signal-detection test. Shapiro and Fox (2002) used signal detection to measure recognition memory regarding atypical and typical messages. In their study, two key terms in measuring memory, *sensitivity* and *criterion bias*, were examined. Sensitivity is a measure of how easily a person can distinguish between true memories and similar ones not relevant to a given situation. A person trying to remember must decide how familiar or strong a memory is before judging that the memory is really of something that has been seen. The person decides that, above some threshold level of familiarity, an item is familiar enough to conclude that he or she has seen it before. Below that level, the item is too unfamiliar, and the person judges that he or she has not seen it. This dividing line is referred to as a criterion, and its location is the criterion bias (Shapiro & Fox, 2002).

One possibility for resolving the mixed results on recall of incongruent versus recall of congruent information can be explained by people's shift in criterion bias when dealing with incongruent information in ads. Shapiro and Fox (2002) found that criterion bias was more conservative for atypical messages than for typical messages, thus reducing the possibility of getting many false alarms but also reducing the possibility of having high levels of hits. Sensitivity, or strength of memory, was higher for atypical messages. Over time, however, judgments about atypical items grew markedly more conservative and the criterion for typical items seemed to become far more liberal. The possible interpretation of such a conservative criterion shift is that the subject might be motivated to minimize false alarms even at the cost of fewer hits. There is in this case a lower possibility of guessing, thereby reducing the possibility of getting a hit by chance, since the judgment was made very conservatively (Shapiro and Fox 2002). The following hypotheses will therefore be tested.

1c. *Hypothesis*: Participants will be more conservative about criterion bias on their memories of incongruent information in ads than about criterion bias on their memories of congruent items.

Incongruity and Arousal

Incongruity is a stimulus that leads to arousal, and according to Mandler (1982) people interpret the tension they encounter from incongruent messages as more positive, as long as the incongruity is considered to be moderate. Arousal from incongruent ads should be greater than arousal from congruent ads since incongruent contents are considered to be arousing, which leads people to evaluate the content more positively and remember it better (Lang, Dhillon, & Dong, 1995). The incongruity that is incorporated in ads should be moderate, however, and slightly

different from what we expect from ads in that category. If the incongruity level is too severe viewers might be unable to resolve it, and a negative evaluation is the likely consequence.

1d. *Hypothesis*: Participant's arousal level will be higher for incongruent ads than for congruent ads.

CHAPTER THREE

An Overview of the Pacing Literature

For decades advertising researchers have been interested in examining message characteristics along with the production features, such as pacing, of an advertisement. Recent research (Lang, Bolls, Potter, & Kawahara, 1999; Yoon, Bolls, & Muehling, 1999) has begun to examine how production features such as pacing may influence the viewing of advertisements and has provided some evidence that changes in production features can lead to changes in consumers' cognitive and affective responses. Their research has shown that production pacing has effects on attention, memory, and attitudes that go beyond the influence of the message content. Production pacing is, therefore (along with message content), a key feature that can influence a viewer in processing media messages. Advertisements featuring a fast-paced style of delivery have become widely prevalent. In order to keep viewers on channel in our multichannel, remote control environment, television producers also have changed the structure and content of their messages to make them shorter and faster (Bellamy & Walker, 1996).

Pacing and Evaluation

A study by Lang et al. (2005) also shows a positive relationship between pacing and evaluation. They found in their study that, as pacing increases, people evaluate stimuli more positively. They investigated whether news story length and production pacing affect channel-changing behavior in younger and older adults. In general, pacing and length have greater effects on younger viewers. Fast pacing was

followed by viewers' rating newscasts more positively. In the study, Lang and her colleagues found a significant pacing effect on evaluation. Participants preferred fast stories to slow stories. Such fast pacing led to more positive evaluations of both long and short stories, but the effect was much greater for long stories. Fast pacing always resulted in more positive evaluations on the part of younger viewers. For older viewers, fast pacing produced more positive evaluations only for long stories. In general, this would seem to suggest that fast pacing will raise viewers' evaluations of programming.

2a. As ad pacing increases, people's evaluation of such ads will be more positive.

Pacing, Incongruity, and Memory

According to Lang (2000), production pacing strongly affects how viewers feel about and learn from television messages. Employing the limited capacity model, Lang defines a television viewer as an information processor with limited mental resources and a television message as a psychological stimulus made up of two streams of variably redundant information, one video-based and one audio-based. The model also proposes three main subprocesses involved in the processing of communication messages: *encoding*, *storage*, and *retrieval*. In this model, memory is defined as the end result of these three subprocesses. Pacing is defined as scene and camera change in a message. Another study by Lang also showed that, as the rate of edits increased, so did physiological arousal, self-reported arousal, and memory (Lang, Zhou, Schwartz, Bolls, & Potter, 2000). The limited capacity model suggests that, as message pacing increases, both the number of orienting responses elicited by a

message and the amount of information to be encoded should also increase. The model also holds that stimuli that elicit arousal result in the automatic allocation of resources to encoding and storage. Thus, an increase in pacing should increase viewers' arousal levels and result in the allocation of additional resources to encoding and storage, which is expected to enhance memory.

Lang and her colleagues argue that the cognitive load demanded by increases in pacing is directly related to the resource requirements of the structural feature being manipulated (Lang et al., 2000). Structural complexity is used as the operational definition of resources allocated. To manipulate structural complexity messages vary by number of camera changes per message which is converted to camera changes per second. However, research shows that the size of individual orienting response, and therefore, the size of the resource allocation, depends on the amount of information introduced by a camera change capturing the continuous nature of the underlying concept of information required. She introduced the term 'ii' to denote information introduced by a structural feature. II is a measure developed by Lang et al. (2006) which compares the information preceding a following camera change on 7 dimensions of information which are related to resource requirements (Lang et al., 2005). In each camera change, this scale measures how much new information is required for a viewer to allocate the necessary mental load to process each camera change. Scene change should not be the sole determinant of production pacing. Information introduced by each scene should be taken into consideration in measuring production pacing.

Increases in pacing lead to unexpected novelty in the environment which directly relates to an *orienting response* so as to increase the resources allocated to encoding (Lang, 1990). Such an orienting response is an involuntary physiological and behavioral reaction that directs our attention toward new or relevant information in the

environment. The limited capacity approach to television viewing suggests that when a television message elicits an orienting response, an increase in the allocation of processing resources to the encoding of information in the message results. However, whether or not each of the three processes—encoding, retrieval, or storage—is performed well depends not only on the allocation of mental resources but also on the cognitive load imposed by messages or tasks. Cognitive load can be viewed as the cost to the viewer, in mental resources, of processing the message. The additional allocation of mental resources leads to an increase in memory when the overall cognitive load imposed by the message does not exceed the viewer's total cognitive capacity (Lang 2005). When incongruity and fast pacing—both require the exercise of a certain degree of mental capacity to interpret the stimuli—are combined, a cognitive overload might occur that prohibits one from performing memory tasks better, leading to a declination of memory.

2b. *Hypothesis*: There will be an interaction between incongruity and pacing such that, for congruency, as pacing increases, recognition will increase. On the other hand, for incongruency, as pacing increases, recognition will increase to a point, and then decline. Overload will occur sooner for incongruent ads than for congruent ads.

Pacing and Arousal

According to Lang's limited capacity model, fast pacing, in addition to eliciting resource allocation, also elicits arousal in viewers (Lang et al., 2005). This is important because arousal plays a major role in message processing and (as noted above) has been found to influence memory (Lang, et al., 1995). The limited capacity model conceptualizes arousal both as an emotional experience and as a physiological

response. This theory, with many supporting studies, predicts that increased production pacing increases both emotional and physiological arousal (Lang, et al., 1999; Lang et al., 2000).

2c Hypothesis: Participants' arousal levels will be higher as pacing increases.

CHAPTER FOUR

An Overview of the Sensation Seeking Literature

Sensation seeking, a personality trait, has figured prominently in the prediction of substance abuse and risky behaviors, as research has found that it is a good predictor of alcohol and drug abuse (Donohew, Lorch, & Palmgeen, 1999; Zuckerman & Kuhlman, 2000; Zuckerman & Neeb, 1980). Other research has identified a preference in sensation seekers for media that are high in arousing content (Dsilva, 1999; McNamara & Ballard, 1999). It is reasonable to say that, in order to target sensation seekers, it is critical to create messages high in arousal value. Production pacing and incongruity, which are both considered to be arousing, are highly related to sensation seeking.

Incongruity, Pacing, and Sensation Seeking

In spite of some mixed results regarding their favorable responses to incongruity, high sensation seekers should evaluate incongruent ads more positively than low sensation seekers do. Lang (2005) has found that high sensation seekers tend to appreciate unexpected novelty more than low sensation seekers, and so should react more positively to incongruent ads, since incongruity is thought to be another kind of novelty. Sensation seekers favor stimuli that enhance fun and excitement and generally enjoy the tension they experience from such arousal. It is therefore an interesting research question whether incongruent information will be better received by individuals with sensation-seeking tendencies, and whether these individuals are more willing to process incongruity than individuals who are not sensation seekers.

Lang (2000) found as well that pacing and arousing media content influenced individuals in processing messages. Many structural features such as fast pacing (again, defined in terms of the number of cuts or edits in a message) have enhanced sensation value. According to Lang's study, high sensation seekers responded more positively to arousing and fast-paced media messages than did low sensation seekers. It will thus be interesting to test both concepts, incongruity and pacing, and their relationships to sensation seekers. Incongruent information that is considered to be arousing and production pacing, a structural feature of visual messages, are expected to be highly related to sensation-seeking tendencies. In this study, both concepts will be employed in ads and tested to determine whether employing them together is better than employing each by itself in terms of eliciting better evaluations and memory with respect to those ads. Since incongruity and fast production pacing are thought to be arousing, individuals will try to reduce the arousal by engaging in more cognitive processing.

Sensation seeking is a tendency driven by internal characteristics to seek out new information. Zuckerman states the classic definition of sensation seeking as a need for "varied, novel, and complex sensations and experience and the willingness to take physical and social risks for the sake of such experience" (Zuckerman, 1979, p.10). Sensation seekers, then, by definition, pursue information that is potentially incongruent with an existing schema. It has been shown empirically that sensation seeking has a positive effect on the acceptance of novel information. Zuckerman (1998) found, for example, that high sensation seekers are receptive to novel stimuli, whereas low sensation seekers tend to reject novelty. Incongruent messages are considered to be high in sensation value since both incongruent and highly sensational stimuli are unique and unexpected with respect to one's existing schema and therefore will more likely attract and motivate high sensation seekers than they will low

sensation seekers. It is therefore reasonable to say that incongruent information will be better received by individuals with sensation-seeking tendencies.

On the other hand, it is logical to predict that low sensation seekers will prefer congruent messages, because congruity is low in sensation value. Donohew et al. (1991) undertook several studies investigating the relationship between sensation seeking and preferences for various types of media messages. Their research showed that high sensation seekers are more attracted to and more easily persuaded by messages that are high in message sensation value, whereas low sensation seekers prefer messages low in message sensation value. Zuckerman (1988) argues that, unlike low sensation seekers, high sensation seekers prefer stimuli that are novel, complex, and ambiguous for eliciting strong emotional reactions. Thus, high sensation seekers prefer surrealistic or impressionistic paintings, whereas low sensation seekers prefer peaceful and realistic scenes (Zuckerman & Ulrich 1983). Donohew et al. and their colleagues in the Kentucky group found a number of studies investigating the relation between sensation seeking and preferences for various types of media messages. It is hypothesized that high sensation seekers will be likely to show more positive feelings, compared with low sensation seekers, during fast-paced and incongruent ads. High sensation seekers might recognize more information from ads that are high in sensation value. It is therefore hypothesized that high sensation seekers, unlike low sensation seekers, should exhibit decreased recognition, indicative of overload, at a later point than low sensation seekers.

3a Hypothesis: High sensation seekers will evaluate incongruent and fast-paced ads more positively than will low sensation seekers.

3b Hypothesis: High sensation seekers will perform better on memory tests

than will low sensation seekers in processing the incongruent ads.

3c Hypothesis: High sensation seekers will exhibit a decrease in recognition at a later point than will low sensation seekers.

Sensation Seeking and Arousal

Incongruity is a stimulus that leads to arousal. It is highly related to high sensation seekers since they enjoy the tension of arousal more than do low sensation seekers. Differences in arousal level are thought to influence a person's need to seek or avoid sensation in order to maintain an optimal level of arousal (Lang 2005). According to Lang, arousing content and fast-paced messages result in the allocation of resources to encoding, which can be determined using recognition measurements. High and low sensation seekers might differ in the experience of arousal while viewing ads. Research has found that high sensation seekers have lower resting arousal than do low sensation seekers (Zuckerman, 1990). According to Goldman, Kohn, and Hunt (1983), high sensation seekers reduce the intensity of an incoming stimulus, whereas low-sensation seekers augment the intensity. Thus, high sensation seekers require more arousing messages to feel equivalent amounts of arousal, whereas low sensation seekers are more easily aroused and thus prefer to avoid messages with high sensation value (Lang 2005). Research on the rates of cuts and edits suggests that fast-paced messages elicit increased arousal in viewers (Yoon et al., 1998). Arousal is an important variable to understand because it is often associated with an increase in memory and the positive evaluation of messages (Lang, et al., 1995). Increasing the number of cuts in messages was clearly shown to increase both viewers' self-reports of arousal and their autonomic arousal (Lang, et al., 1999). Based on this reasoning, the following hypotheses will be tested.

3d *Hypothesis*: High sensation seekers will experience lower levels of arousal during incongruent ads than will low sensation seekers.

3e *Hypothesis*: High sensation seekers will experience lower levels of arousal during fast-paced ads than will low sensation seekers.

CHAPTER FIVE

Method

Ad execution that is incongruous with ad schema and production pacing will be manipulated in a 2 (congruity, incongruity) X 3 (slow, medium, fast pacing) mixed experimental design. The experiment will be conducted to examine sensation-seeking tendencies and the processing of congruent and incongruent advertisements, as well as fast, medium, and slow production pacing. The six conditions of the advertisements will be low-paced congruent, low-paced incongruent, medium-paced congruent, medium-paced incongruent, high-paced congruent, and high-paced incongruent. This design should facilitate the thorough examination of interaction effects, an important requirement for testing the proposed hypotheses. Each subject was given a sensation-seeking measure when seated for the experiment, which was conducted at the local shopping mall and in a classroom setting. Each subject evaluated six advertisements that were played in random order from two product categories, cars and over-the-counter drugs. The total of 12 ads, six for cars and six for drugs, corresponds to the six conditions in the experiment. Incongruity, production pacing, and sensation seeking were within-subject factors and product categories were between-subject factors.

Participants

Twenty undergraduates enrolled at Cornell University participated in the experiment and were given extra credit for a communication course. Forty adults at a local shopping mall also participated in the study. They received a chocolate cookie for their participation.

Stimulus Development

Six car TV advertisements and six over-the-counter drug TV advertisements were selected from a pool of about 50 advertisements that were gathered from local TV channels. The TV advertisements varied in terms of production pacing—with slow, medium or fast production pacing—and in terms of incongruity—with either congruity or incongruity—resulting in six categories.

Independent Variables

Incongruity

Five graduate students in Communication were asked to rate 50 ads from the over-the-counter drugs and car categories using a 1 to 5 scale, with 1 being very typical and 5 being very atypical. They rated car and drug ads separately. For this particular study, Krippendorff's alpha value was calculated to select the appropriate ads. Krippendorff's Alpha generalizes across scales of measurements; can be used with any numbers of observers, with or without missing data; and it satisfies all of the important criteria for a good measure of reliability (Hayes & Krippendorff, 2007). Krippendorff's alpha has been proposed to be the standard reliability statistic for content analysis and similar data making efforts. Hayes's Kalpha macro that computes Krippendorff's alpha reliability estimate for judgments (Andre F. Hayes. SPSS and SAS macro for computing Krippendorff's alpha from <http://www.comm.ohio-state.edu/ahayes/>) was used in SPSS to compute Krippendorff's Alpha-5000 bootstrap samples to produce confidence intervals at the 95% level. For drug ads it shows that Krippendorff's ordinal alpha is 0.86, a modest degree of reliability. This alpha level was laid between 95% confident level of .83 to .88. For car ads, it shows that Krippendorff's ordinal alpha is 0.82 again a modest degree of reliability. This alpha level was laid between 95% confident level of 0.79 to 0.84. Among 50 ads, six car and

six drug ads were selected by ordering them from the least congruent to the most congruent, with half of the ads representing incongruent information and the rest representing congruent information, based on the agreement between coders. For drug ads, the mean value for the incongruent ads was 4 and the mean value for the congruent ads was 2.3. For car ads, the mean value for the incongruent ads was 3.8 and the mean value for the congruent ads was 2.5.

Production Pacing

Lang's production-pacing scale was applied to each ad to select the fast, medium, and slow ads. Three levels of pacing—slow, medium, and fast—will be identified for the study. For each camera change seven dimensions should be considered in deciding how much information is introduced by that particular scene. Emotion change, new object introduction, relatedness, object change, distance change, perspective change, and form change are the seven dimensions; one scene can obtain up to 7 points if all the dimensions are met. Following the procedure introduced by Lang, a pacing index was created by adding the number of audio information features and the number of visual information features that were introduced by a scene change. On the pacing index, slow pacing ranged from 0-10 points, medium pacing ranged from 11-20 points, and fast pacing ranged from 21-33 points.

Sensation Seeking

Sensation seeking will be assessed by the eight-item Brief Sensation-Seeking Scale (BSSS; Hoyle et al., 2002). Respondents were asked how much they agreed or disagreed with items such as "I would like to explore strange places," "I like to do frightening things," "I would like to try bungee jumping," and "I would love to have new and exciting experiences, even if they are illegal." Higher scores on this task

would indicate a higher level of sensation seeking on the part of respondents. The scale has exhibited a good coefficient alpha of around .78 and good construct validity (Lu & Zimmerman, 2006).

Dependent Measures

Memory

A signal-detection measure was employed for subject memory. Items included in the ad are target items. Items not included in the stories are foil items. Three true items and three foil items per ad were chosen, for a total of 36 memory-test questions per ad category. Ads were divided into three segments—of 0-10, 11-20, and 21-30 seconds apiece—and a sentence for a true question was selected from each segment. A foil question was created by modifying one word from the true-question sentence, usually by changing adjectives. Thirty-six questions, 18 each for true and foil items, were randomly ordered in the tests and were presented to subjects, who were then asked to recall whether or not they had seen the items in ads. Participants were asked to recognize the statements that appeared in the ads. If a participant selects an item that he or she has actually seen, that represents a hit. If a participant selects an item that he or she has not actually seen, that is labeled a false alarm. All the true and false items are included in the Appendix.

Evaluations

Subjects were asked to indicate the extent of their agreement with attitudinal statements using a 7-point scale, with 1 being ‘strongly disagree,’ 4 being ‘neutral,’ and 7 being ‘strongly agree.’ To evaluate a subject’s attitude toward the ad (Aad), the statements are as follows: “I dislike the ad”; “the ad is appealing to me”; “the ad is interesting to me”; “the ad is attractive to me”; and, “I think the ad is bad.” To evaluate the attitude toward the brand (Ab), the statements are as follows: “The brand in the ad

is likely to possess the stated ad claims”; “I react favorably to the brand”; “I feel positive toward the brand”; “I dislike the brand” (Lee & Mason, 1999).

Arousal

A 6-item semantic differential scale was used to indicate participants’ arousal levels (stimulated versus relaxed, excited versus calm, frenzied versus sluggish, jittery versus dull, wide awake versus sleepy, aroused versus unaroused); each item was anchored by a +4 to -4 rating (Mehrabian and Russell 1974).

Experimental Procedure

Forty volunteer subjects were recruited at the local shopping mall and 20 subjects were recruited from among undergraduate students in the Department of Communication at Cornell University. The subjects were tested on either car or over-the-counter drug TV ads and all six ads in each category were randomly ordered. Subjects at the mall were given a chocolate cookie as a token of appreciation for participating in the study. Subjects recruited from school were given extra credit in a communication course for participating in the study. All subjects were first given a brief explanation about the experiment. They were told that this experiment was designed to gauge the effectiveness of the TV advertisements. Each subject was seated in front of a computer and watched one ad at a time. Questions immediately followed regarding the evaluation and arousal levels of the subjects. Subjects completed the questionnaire at their own pace. There was no communication between subjects during the experiment. After watching all six ads and finishing all the questionnaires, the subjects were given a distracter task of playing Sudoku, a puzzle game, to balance out their differing responses to the ads, equate arousal levels at retrieval, and force them to use more than short-term memory in their responses. They were given three minutes to

play with the puzzle game. A memory test followed, which was composed of randomly ordered foil and target items. The subjects were asked to identify whether they had seen these items in the ads. After the memory tests, subjects were asked to complete a sensation-seeking behavior-scale assessment. As the subjects completed the entire questionnaire, they were debriefed and dismissed.

CHAPTER SIX

Results

Four dependent variables—evaluation, sensitivity, criterion bias, and arousal—were analyzed using a 2 X 3 mixed repeated-measure ANOVA design. The within-subjects factors were pacing (slow vs. medium vs. fast) and congruity (congruent ads vs. incongruent ads). The between-subjects factors were ad type (car ad vs. over-the-counter drug ad) and sensation-seeking tendencies (high vs. low sensation seeker). Analyses are reported in the order of the independent variables.

Effects of Congruity

Evaluation

Pearson correlations for the evaluation variables were tested to investigate whether all the evaluation variables are highly correlated to use as dependent variables. Pearson correlations, which were calculated so as to compare two variables at a time among all variables, were on average 0.8, indicating a high level of correlation among variables. All the responses among the questions (four for ad evaluation and four for brand in ad) were highly correlated; it is therefore reasonable to use all four ad evaluation variables and all four brand evaluation variables to test evaluation.

Table 1 results. Overall, incongruent ads (mean= 5.09) were evaluated more positively than congruent ads (mean=4.24), $F(1,58)=38.65$, $p<0.05$, $\eta^2=0.4$. Hypothesis 1a is supported. Congruence-by-pacing-by-ad type interaction was significant, $F(2,116)=7.82$, $p<0.05$, $\eta^2=0.26$. All the incongruent car ads were evaluated more positively than were congruent car ads.

Table 1. Mean and Std. Error for Evaluation

Estimates	Evaluation			
	Adtype	Congruence	Pacing	Mean
Car	Incongruence	Slow	5.13 ^a	0.21
		Medium	5.28 ^b	0.22
		Fast	5.67 ^c	0.18
	Congruence	Slow	4.13 ^a	0.22
		Medium	4.52 ^b	0.20
		Fast	4.28 ^c	0.19
Drug	Incongruence	Slow	5.10 ^d	0.21
		Medium	4.77	0.22
		Fast	4.59	0.18
	Congruence	Slow	3.48 ^d	0.22
		Medium	4.53	0.20
		Fast	4.48	0.19

Note: Means for the same letters are significant. *A Bonferroni adjustment for multiple comparisons was used.

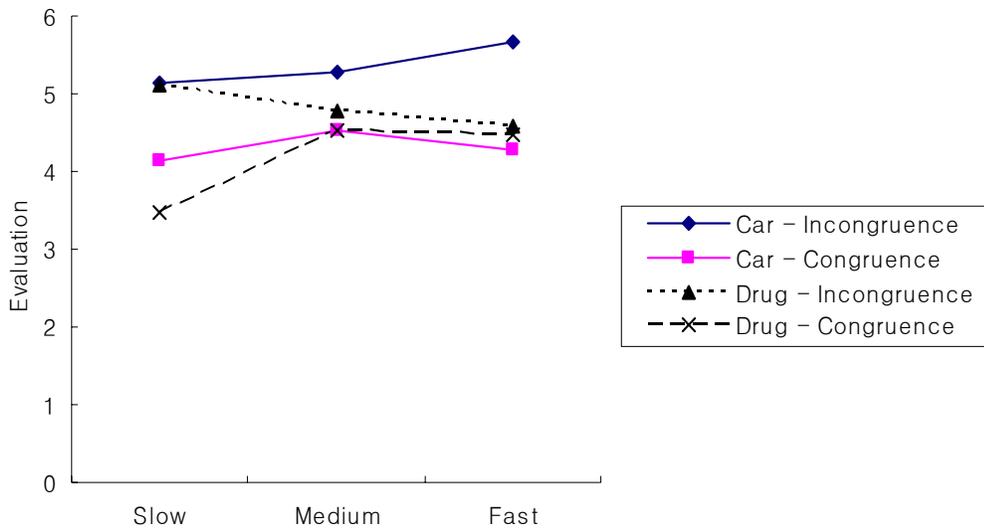


Figure 2. Ad type X Pacing X Congruence on Evaluation

With respect to over-the-counter drug ads, however, only slow incongruent ads were evaluated as significantly more positive than congruent ads. Evaluation was tested

with respect to both evaluation of the ad and evaluation of the brand that is advertised. Brands advertised in incongruent ads were also evaluated more positively than brands in congruent ads, $F(1,58)=28.49$, $p<0.05$, $\eta^2=0.33$. There was a significant congruence-by-pacing-by-ad type interaction, $F(2,116)=4.69$, $p<0.05$, $\eta^2=0.08$. All the brands in incongruent car ads once again were evaluated more positively than were those in congruent car ads. With respect to the over-the-counter drug ads, however, only the brands in slow incongruent ads were evaluated more positively than were those in congruent ads. A Bonferroni adjustment for multiple comparisons was used in order to examine the meaning of the three-way interaction. The technique was used to adjust and reduce as much as possible the errors that might have been caused by chance with the multiple comparisons.

Table 2. Mean and Std. Error for Brand Evaluation

Estimates	Brand evaluation		Mean	Std. Error
	Adtype	Congruence		
Car	Incongruence	Slow	5.13 ^a	0.19
		Medium	5.27 ^b	0.19
		Fast	5.62 ^c	0.17
	Congruence	Slow	4.34 ^a	0.23
		Medium	4.33 ^b	0.18
		Fast	4.41 ^c	0.19
Drug	Incongruence	Slow	4.78 ^d	0.19
		Medium	4.69	0.19
		Fast	4.79	0.17
	Congruence	Slow	3.89 ^d	0.23
		Medium	4.63	0.18
		Fast	4.91	0.19

Note: Means for the same letters are significant. *A Bonferroni adjustment for multiple comparisons was used.

Sensitivity

There were no main effects of congruence, $F(1,58)=1.33$, $p>0.05$, $\eta^2=0.02$ or pacing, $F(2,116)=1.26$, $p>0.05$, $\eta^2=0.02$ on sensitivity. There was, however, a significant congruence-by-pacing interaction on sensitivity, $F(2,116)=4.4$, $p<0.05$, $\eta^2=0.07$. Overall, incongruent ads were more sensitive, which indicates greater memory strength, than congruent ads. In particular, medium-paced incongruent ads (mean=0.558) were significantly more sensitive than medium-paced congruent ads (mean=0.193). Hypothesis 1b is supported.

Table 3. Mean and Std. Error for Sensitivity

Estimates		Sensitivity	
Congruence	Pacing	Mean	Std. Error
Incongruence	Slow	0.32	0.10
	Medium	0.56 ^a	0.08
	Fast	0.15	0.12
Congruence	Slow	0.15	0.10
	Medium	0.19 ^a	0.10
	Fast	0.37	0.09

Note: Means for the same letters are significant.
*A Bonferroni adjustment for multiple comparisons was used.

Criterion Bias

With respect to criterion bias, no main effect of either congruence or pacing were found, [congruence: $F(1,58)=0.02$, $p>0.05$, $\eta^2=0.00$; pacing: $F(2,116)=0.04$, $p>0.05$, $\eta^2=0.00$]. However, with respect to congruence-by-pacing-by-ad type, three-way interaction was significant, $F(2,116)=4.63$, $p<0.05$, $\eta^2=0.07$, on criterion bias. Fast-paced incongruent ($c=0.27$) car ads were more conservative than fast-paced

congruent car ads($c=-.01$). Also, medium incongruent over-the-counter drug ads($c= -0.02$) were more conservative than medium congruent drug ads($c= -0.24$). Hypothesis 1c is supported. Overall, people were more conservative on their memories of incongruent ads for criterion bias than on memories of congruent ads.

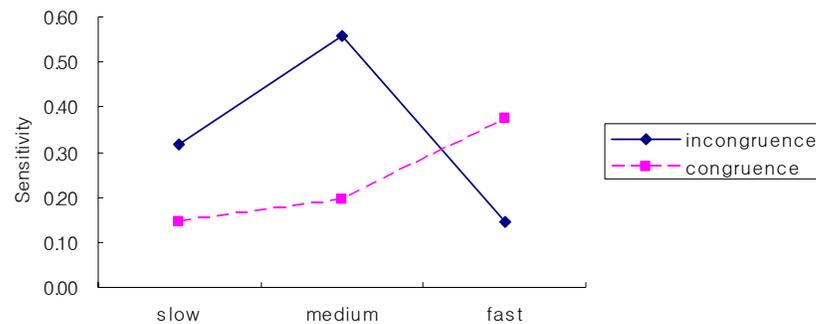


Figure3. Congruence X Pacing on Sensitivity

Table 4. Mean and Std. Error for Criterion Bias

Estimates		Criterion bias		
Adtype	Congruence	Pacing	Mean	Std. Error
Car	Incongruence	Slow	0.10	0.10
		Medium	0.00	0.07
		Fast	0.27 ^a	0.08
	Congruence	Slow	0.27	0.08
		Medium	0.12	0.09
		Fast	0.00 ^a	0.07
Drug	Incongruence	Slow	-0.38	0.10
		Medium	-0.02 ^b	0.07
		Fast	-0.25	0.08
	Congruence	Slow	-0.18	0.08
		Medium	-0.24 ^b	0.09
		Fast	-0.20	0.07

Note: Means for the same letters are significant. *A Bonferroni adjustment for multiple comparisons was used.

Arousal

As expected, arousal level was higher for incongruent ads than for congruent ads. There was a main effect of congruence, $F(1,58)=224.38$, $p<0.05$, $\eta^2=0.8$. A main effect of ad type was also found, $F(1,58)=3.92$, $p<0.05$, $\eta^2=0.06$. All the car ads (mean=3.1) were more arousing than over-the-counter drug ads (mean=2.6). There was also significant three-way interaction, congruence-by-pacing-by-ad type, $F(2,116)=10.85$, $p<0.05$, $\eta^2=0.16$. All the incongruence car ads (mean=4.0) were significantly more arousing than incongruent drug ads (mean=2.2) and all the congruent car ads (mean=4.8) were also significantly more arousing than congruent drug ads (mean=0.5).

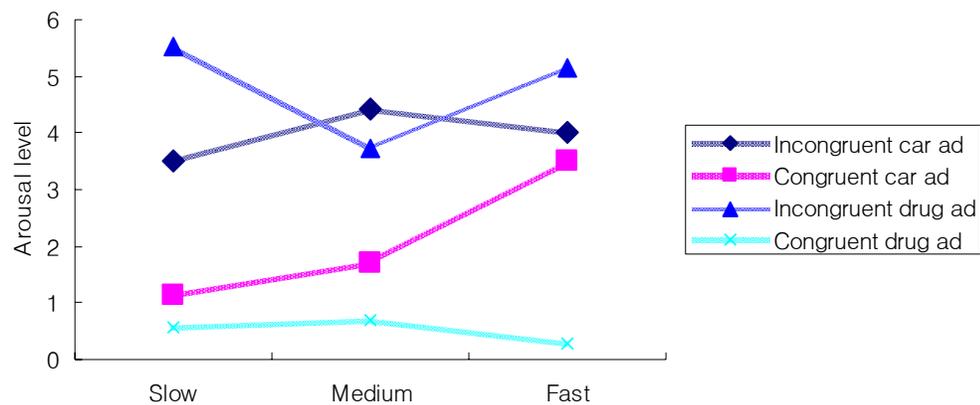


Figure 4. Pacing X Congruence X Ad Type Interaction

Table 5. Mean and Std. Error for Arousal

Adtype	Congruence	Pacing	Mean	Std. Error
Car	Incongruence	Slow	3.50 ^a	0.29
		Medium	4.43 ^b	0.39
		Fast	4.00	0.37
	Congruence	Slow	1.13 ^a	0.31
		Medium	1.70 ^b	0.30
		Fast	3.97	0.30
Drug	Incongruence	Slow	5.53 ^c	0.29
		Medium	3.73 ^d	0.39
		Fast	5.13 ^e	0.37
	Congruence	Slow	0.57 ^c	0.31
		Medium	0.70 ^d	0.30
		Fast	0.30 ^e	0.30

Note: Means for the same letters are significant. *A Bonferroni adjustment for multiple comparisons was used.

Effects of Pacing

Evaluation.

There was a main effect of pacing, $F(2,116)=3.17$, $p<0.05$, $\eta^2=0.1$. Medium (mean=4.8) and fast-paced ads (mean=4.8) were evaluated more positively than slow-paced ads (mean=4.4). There was a three-way interaction, congruence-by-pacing-by-ad-type, on evaluation, $F(2,116)=7.82$, $p<0.00$, $\eta^2=0.26$. With respect to car ads, fast-paced incongruent car ads (mean=5.1) were evaluated more positively than slow incongruence car ads (mean=5.6). Also, with respect to over-the-counter drug ads, surprisingly, slow-paced incongruent ads (mean=5.1) were evaluated more positively than fast-paced incongruent ads (mean=4.5). With respect to congruent drug ads, medium-paced ads (mean=4.5) were evaluated more positively than slow-paced ads

(mean=3.4) and fast-paced ads (mean=4.4) were evaluated more positively than slow-paced ads. Hypothesis 2a is supported. With respect to the brand, evaluation-of-pacing effect, a three-way interaction, congruence-by-pacing-by-ad-type, was found, $F(2,116) = 4.69, p < 0.00, \eta^2 = 0.08$. With respect to the car ads, brands advertised in fast incongruent ads (mean=5.6) were evaluated more positively than those in slow incongruent ads (mean=5.1). None of the results for congruent ads was significant, $p > 0.05$. Regarding the drug ads, interestingly, none of the results for incongruent ads was significant, $p > 0.05$. Only brands in medium-paced (mean=4.6) and fast-paced ads (mean=4.9) were evaluated significantly more positively than slow-paced ads (mean=3.9).

Table 6. Pairwise Comparisons between slow and medium paced ads

Ad type	Congruence	Pacing	Evaluation		Brand Evaluation		Arousal	
			Mean	Std. Error	Mean	Std. Error	Mean	Std. Error
Car	Incongruence	Slow	5.13	0.21	5.13	0.19	3.50 ^c	0.29
		Medium	5.28	0.22	5.27	0.19	4.43 ^c	0.39
	Congruence	Slow	4.13	0.22	4.34	0.23	1.13	0.31
		Medium	4.52	0.20	4.33	0.18	1.70	0.30
Drug	Incongruence	Slow	5.10	0.21	4.78	0.19	5.53 ^d	0.29
		Medium	4.77	0.22	4.69	0.19	3.73 ^d	0.39
	Congruence	Slow	3.48 ^a	0.22	3.89 ^b	0.23	3.74	0.31
		Medium	4.53 ^a	0.20	4.63 ^b	0.18	3.75	0.30

Note: Means for the same letters are significant. *A Bonferroni adjustment for multiple comparisons was used.

Table 7. Pairwise Comparisons between slow and fast paced ads

Adtype	Congruence	Pacing	Evaluation		Brand Evaluation		Arousal	
			Mean	Std. Error	Mean	Std. Error	Mean	Std. Error
Car	Incongruence	Slow	5.13 ^a	0.21	5.13 ^c	0.19	3.50	0.29
		Fast	5.67 ^a	0.18	5.62 ^c	0.17	4.00	0.37
	Congruence	Slow	4.13	0.22	4.34	0.23	1.13 ^e	0.31
		Fast	4.14	0.19	4.41	0.19	3.97 ^e	0.30
Drug	Incongruence	Slow	4.15	0.21	4.78	0.19	5.53	0.29
		Fast	4.16	0.18	4.79	0.17	5.13	0.37
	Congruence	Slow	4.17 ^b	0.22	3.89 ^d	0.23	0.57	0.31
		Fast	4.18 ^b	0.19	4.91 ^d	0.19	0.30	0.30

Note: Means for the same letters are significant. *A Bonferroni adjustment for multiple comparisons was used.

Table 8. Pairwise Comparisons between medium and fast paced ads

Adtype	Congruence	Pacing	Evaluation		Brand Evaluation		Arousal	
			Mean	Std. Error	Mean	Std. Error	Mean	Std. Error
Car	Incongruence	Medium	5.28	0.22	5.27	0.19	4.43	0.39
		Fast	5.67	0.18	5.62	0.17	4.00	0.37
	Congruence	Medium	4.52	0.20	4.33	0.18	1.70 ^a	0.30
		Fast	4.28	0.19	4.41	0.19	3.97 ^a	0.30
Drug	Incongruence	Medium	4.77	0.22	4.69	0.19	3.73 ^b	0.39
		Fast	4.59	0.18	4.79	0.17	5.13 ^b	0.37
	Congruence	Medium	4.53	0.20	4.63	0.18	0.70	0.30
		Fast	4.48	0.19	4.91	0.19	0.30	0.30

Note: Means for the same letters are significant. *A Bonferroni adjustment for multiple comparisons was used.

Sensitivity

There was an interaction effect between congruence and pacing on sensitivity,

$F(2,116)=4.4$, $p<0.05$, $\eta^2=0.071$. As expected, cognitive overload was found with respect to incongruent fast-paced ads. As pacing increased, memory strength was increased for congruent ads. However, regarding incongruent ads, as pacing increased memory strength also increased, up to the point at which they became medium paced, and then declined due to cognitive overload. Hypothesis 2b is supported.

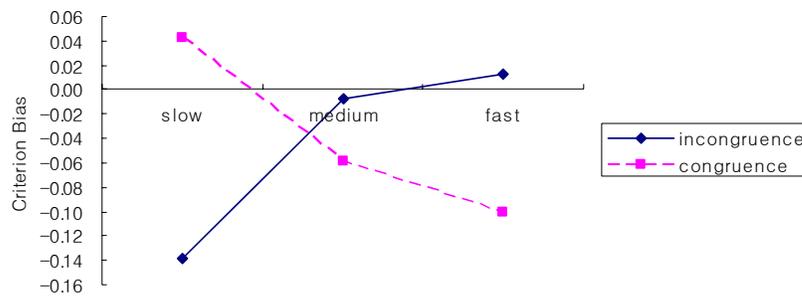


Figure 5. Criterion Bias between Congruence X Pacing

Arousal

With respect to arousal, a pacing main effect was found, $F(2,116)=6.16$, $p<0.05$, $\eta^2=0.1$. Fast-paced ads (mean=3.3) were more arousing than medium- (mean=2.2) or slow-paced ads (mean=2.6). An ad-type main effect was also found, $F(1, 58)=3.92$, $p<0.05$, $\eta^2=0.06$. Car ads (mean=3.1) were significantly more arousing than over-the-counter drug ads (mean=2.6). Interaction of congruence-by-pacing-by-ad-type was found, $F(2,116)=10.85$, $p<0.05$, $\eta^2=0.22$. Regarding the car ads, medium incongruent ads (mean= 4.4) were significantly more arousing than slow-paced incongruent ads (mean=3.5). Also, fast-paced congruent ads (mean=3.9) were significantly more arousing than either slow- (mean=1.1) or medium-paced congruent

ads (mean=1.7). With respect to the drug ads, slow-paced incongruent ads (mean=5.7) were significantly more arousing than medium-paced incongruent ads (mean=3.7). Fast-paced incongruent ads (mean=5.1) were also significantly more arousing than medium-paced incongruent ads (mean=3.7). However, none of the congruent ads were significant enough to make a claim that slow-, medium-, and fast-paced congruent ads were different from each other.

Effects of Sensation Seeking

Evaluation

For the evaluation of the ads, there was a main effect of sensation seeking on evaluation, $F(1,56)=4.26$, $p<0.05$, $\eta^2=0.07$. High sensation seekers (mean=4.8) evaluated the ads more positively than low sensation seekers (4.5). There is, however, no interaction effect between sensation seeking with pacing ($p=0.44$) or congruence ($p=0.17$). Also there is no three-way interaction between sensation seeking, pacing, and congruence ($p=0.65$). Regarding the evaluation of the brands, an interaction effect was found between congruence and sensation seeking. The brands in incongruent ads (mean=5.2) were evaluated more positively by high sensation seekers than were those in incongruent ads by low sensation seekers (mean=4.2). Also, all the brands in incongruent ads were evaluated by both high (mean=5.8) and low sensation seekers (mean=4.8) more positively than were those in congruent ads [high: mean=4.3, low: mean=4.5]. There was, however, no interaction effect found between sensation seeking and pacing, $F(2,116)=0.8$, $p>0.05$, $\eta^2=0.01$. Pacing seemed not to influence high and low sensation seekers to perform significantly differently on the evaluation of the ads.

Hypothesis 3a is partially supported.

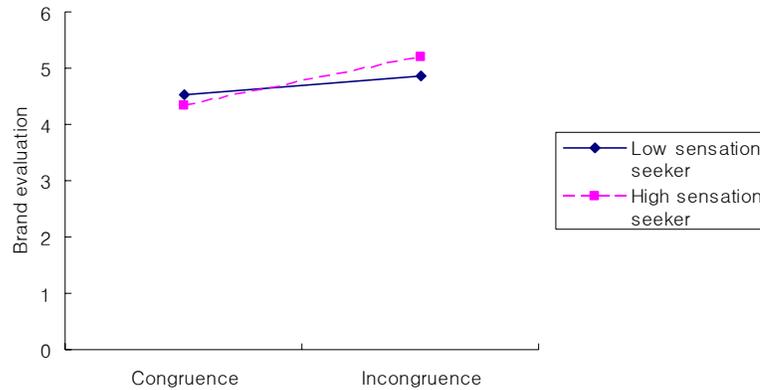


Figure 6. Brand Evaluation between High and Low Sensation Seekers

Table 9. Significance on Brand Evaluation

Sensation seeking value	Congruency	Mean
low sensation seeking	Incongruence	4.86 ^a
	Congruence	4.53 ^b
high sensation seeking	Incongruence	5.21 ^a
	Congruence	4.32 ^b

Note: Means for the same letters are significant. *A Bonferroni adjustment for multiple comparisons was used.

Sensitivity

With respect to memory, there was no interaction effect between congruence and sensation seeking, $F(1, 58) = 2.26$, $p > 0.05$, $\eta^2 = 0.04$. Hypotheses 3b and 3c are not supported. There was no pacing-by-sensation-seeking interaction on memory, $F(2, 116) = 0.24$, $\eta^2 = 0.05$. There was no congruence-by-pacing-by-sensation-seeking-by-ad-type interaction on memory, $F(2, 116) = 2.73$, $p > 0.05$, $\eta^2 = 0.05$.

Arousal

With respect to arousal, there was neither congruence-by-sensation-seeking interaction, $F(1,58)=0.24$, $p>0.05$, $\eta^2=0.00$, nor pacing-by-sensation-seeking interaction, $F(2,116)=2.43$, $p>0.05$, $\eta^2=0.04$. Hypotheses 3d and 3e are not supported. There was no congruence-by-pacing-by-sensation-seeking-by-ad-type on arousal, $F(2,116)=1.9$, $p>0.05$, $\eta^2=0.03$. There was no significant difference between high and low sensation seekers on arousal and memory.

CHAPTER SEVEN

Discussion and Conclusion

Summary of the Main Findings

Subjects' goals were to evaluate how pleasing and arousing the ads were and how much they remembered the ads' claims. The findings confirm that, overall, incongruent ads were evaluated more positively, and people were more aroused by them. This supports Mandler's (1982) incongruence theory, which holds that incongruent ads are more arousing and people interpret the stimuli to be more positive as long as the stimuli are moderate. The subjects in this study remembered more detail from the incongruent ads than from the congruent ads. Their sensitivity level was higher for incongruent ads and the criterion bias was more conservative.

The results also support a significant effect for production pacing in conjunction with congruity. As pacing increased, people's arousal levels rose and their evaluations became more positive. A significant difference was found in the main effect by ad type. Car ads were more arousing and more positively evaluated than were drug ads. It is worth noting that there was no production pacing effect found for congruent drug ads on arousal. This finding supports the notion that arousal level is a key to the positive evaluation of ads. Congruent drug ads were highly unarousing, as shown by their evaluations, which were far less positive than were those for incongruent ads that displayed a high level of arousal.

The results also reflect the limited capacity model proposed by Lang et al. (1999). With respect to congruence, as pacing increased, memory also increased, but

with respect to incongruence, as pacing increased, memory increased to the medium-paced point and then declined thereafter. As predicted, cognitive overload seems to occur in people when they are interpreting incongruent fast-paced ads. According to Lang (2000), cognitive overload occurs when the overall cognitive load imposed by messages is greater than the viewer's total capacity to process the stimuli. This finding clearly shows that people's total capacity to process stimuli was lower than the total capacity required when processing fast-paced incongruent ads. Memory sensitivity dropped where cognitive overload began. It is recommended that advertisers focus either on pacing or on incongruity for good evaluation and memory.

Another goal of the study was to determine whether and to what extent sensation seekers were affected by incongruity and production pacing. There was a significant sensation-seeking-by-congruence interaction on brand evaluation. High sensation seekers evaluated brands in incongruent ads significantly more positively than did low sensation seekers. Donohew et al. (1991) found that structural features such as production pacing contribute little to distinguishing the preferences that characterize high sensation seekers and low sensation seekers, but message content such as novelty or fear appeals do. This might explain why high and low sensation seekers differed in their responses to structural features and the contents of a message. In the present study, high and low sensation seekers responded significantly differently only to incongruent and congruent ads. It is suggested that since high and low sensation seekers seemed to react differently in processing incongruent contents and production pacing, it may be wise to focus more on separating the effects of structural and content features on high and low sensation seekers (Lang, et al., 2005).

Contrary to expectations, there was no pacing effect or arousal level difference between high and low sensation seekers. High and low sensation seekers weren't significantly different from each other in terms of remembering the ads' claims. High sensation seekers were not necessarily more sensitive than low sensation seekers and their criterion bias was not conservative, again contrary to expectations. Many confounding variables might influence participants in processing the ads. In addition to automatic resource allocation mechanisms, viewers can also allocate mental resources to one or more of the subprocesses voluntarily. Voluntary resource allocation is driven by the viewer's motivations, interests, needs, or goals and occurs when a viewer actively engages in television viewing. There is no novelty in arguing that viewers' intentions can influence the processing of messages.

The absence of sensation-seeking effects on memory could be due in part to the nature of subject selection and the way in which the high and low sensation-seeking groups were dichotomized. The subjects were recruited from a local shopping mall and half of them were undergraduate students at Cornell. Since volunteer subjects were used, none of the following factors were controlled: age, gender, the relevance of the ads to the subjects, and participants' motivation to process the ads. It is hard to make a judgment as to how relevant the car and drug ads were to undergraduate students, whose interests might not be relevant to those categories. Lang et al. (2005) found that age was an important factor in the recognition of public service announcements. Adolescents showed better encoding of information contained in substance-abuse PSAs than did college students. In the present study, age was not controlled, and so there could be an age effect among the participants. Such a

confounding variable might explain why high and low sensation seekers did not perform significantly differently from each other. It is also possible that the dichotomization of the samples into two groups brought about by ranking the sensation-seeking scales from low to high explains why there was no significant difference between high and low sensation seekers. The mean was suspiciously high. The subjects' scores seemed to be skewed toward higher scores above the mean. Thus, the division between the two high and low groups is not as well defined as it should be. If that is the case, a better way of dividing the two groups that can more accurately reflect high and low sensation seekers is recommended for future research.

This study tested two levels of incongruity, congruence and incongruence, insofar as neutral responses were excluded from the data. Slightly incongruent ads were used because Mandler has insisted that slightly incongruent stimuli tend to be evaluated positively while severely incongruent stimuli are almost impossible to resolve, leading to negative evaluations of such stimuli. Future studies should test severe incongruity to observe responses to severe stimuli. In theory, severe incongruity is less likely to be evaluated positively. Combined with fast production pacing, cognitive overload should occur sooner with severely incongruent stimuli than with slightly incongruent stimuli.

Three levels of production pacing were used to test the effect of cognitive overload when it results from people's lack of mental capacity to process a set of stimuli. Cognitive overload occurred when slightly incongruent ads were combined with fast production pacing. It is expected that a slight increase in pacing could lead to a cognitive overload when combined with severely incongruent stimuli, leading to a

declination of memory. It would be worthwhile to determine through tests what levels of incongruity and production pacing cause greater cognitive overload. This would allow advertisers to adjust the levels of incongruity and production pacing when combined, so as to improve audience memory of ads or products in ads.

Contributions

This study sheds significant light on the area of the effect of incongruity on memory. There have been mixed results pertaining to a superior incongruent effect over a congruent effect. By applying the signal detection test, Shapiro and Fox (2002) found that memory strength was higher for the atypical items than for the typical items. They also found that participants became more liberal in accepting memories of typical items and more conservative in accepting memories of atypical items. The present study also found that memory strength or sensitivity was stronger for incongruent ads than for congruent ads. The criterion bias that was exhibited with respect to incongruent ads was also more conservative than that which was exhibited for congruent ads. In the past, this shifting of criterion bias in judging whether incongruent ads have been seen might have led to mixed results in memory tasks on incongruity in ads. According to Shapiro and Fox, people were more cautious about making judgments about atypical items; therefore, their level of criterion bias was low with respect to atypical information. This reduced the probability that they would report false alarms or report accurately on items they had actually seen. A shift to a more liberal criterion causes an increase in hits. A researcher who counts only the number of hits or the number of correct rejections may mistakenly conclude that

recognition memory is better for that condition when in fact the difference is a result of a change in judgment about memory, not a result of better memory (Shapiro, Dunwoody, & Friestad, 1987). This conservative criterion bias might have led individuals to perform worse on the memory test for incongruity than on congruity. In the present study, memory superiority for incongruity was tested using both the sensitivity and the conservativeness of the criterion bias of participants, and it was found that incongruent ads were better remembered and people were more conservative with respect to incongruent ads than to congruent ads.

An advantage gained as a result of this research was the valuable finding of a superior effect of incongruity on memory by using the signal-detection theory. This test allowed a determination of what might have led people to be less likely to make judgments on incongruent ads than on congruent ads. This shift in criterion bias was the key to explaining why some studies have found that congruity is remembered better than incongruity. Memory psychologists have long recognized that judgment and motivation in memory varies between individuals and between situations (Pastore & Scheirer, 1974). The signal detection measures enabled researchers to look at both the memory strength and the judgment aspects of memory.

Another contribution made by this study is the finding that the effects of both arousing contents and production pacing are important to success in advertising. There is a caveat to be noted, however, in that cognitive overload can occur if both fast production pacing and incongruity are applied. The use of both stimuli should be carefully controlled for maximum effect on the intended audience, which could be pushed beyond the limits of its mental processing capabilities. In general, taken

separately, the findings on production pacing and incongruity are very valuable. It is recommended that ads be made with faster pacing and with greater creativity so that people can better evaluate them, remember them more clearly, and be more highly aroused by them. The degree of atypicality should, however, be determined carefully, as consumers may assimilate ad information that is only slightly discrepant from category expectations. They are more likely to contrast or reject information that is highly incongruent with their beliefs (Goodstein, 1993).

Limitations and Future Research Directions

The present study was subject to several weaknesses that could be improved for the purposes of future studies. There was only one ad representing each category. It would be wise to have more ads that represent each category of incongruity and pacing. In that way, study findings would be more concrete and all the confounding variables in the ads could be cancelled out by looking at multiple ads per category. The ad category also should be carefully determined, even though car and drug ads were chosen because these two categories are widely prevalent in TV ads. The relevancy of the category of the ads to the subjects should however be considered for future study to ensure a strong argument. It is also recommended that subjects be recruited in a more consistent way to produce less variability among their characteristics; gender and age should be carefully controlled to strengthen our confidence in the results.

Cognitive overload has been found to be highly related to stimuli characteristics; continuous stimuli such as television and radio messages are more likely to cause overload when compared with controlled stimuli such as newspapers

(Lang et al., 2005). It would be interesting, therefore, to expand the study of incongruity to other media such as newspaper ads to test whether the effects of newspaper ads are the same as those of TV ads.

Finally, it is important that future investigations of audiences' ad-processing capabilities should consider the brand schema with an ad. There can be brand-related category schemas. For example, many brands have their own set of themes in their advertising style, as is the case with Geico and its use of humor and incongruity. Most other ads from financially related companies are less humorous and fairly calm compared with those from Geico. It is therefore worth considering how each brand achieves its own typicality in consumers' minds as well as what role the incongruity effect may play in a study when brand category typicality is considered as another significant factor in processing ads. Consumers' predetermined evaluations of a specific brand can also be investigated even before studying an ad itself. Consumers' evaluations of a brand before and after exposure to such ads would provide a good tool with which to measure the effectiveness of advertisements.

It was also found here that participants preferred car ads to drug ads. Advertisers can examine how to draw more attention to and change consumers' attitudes towards drug ads by making more creative drug commercials. Either incongruity or production pacing should be exploited to increase the interest of the audience in watching drug ads. It is always wise, however, to use a moderate level of incongruity to induce an audience to accept new stimuli as positive rather than negative.

APPENDIX

Questions for memory

Car Ads

Chrysler

True Qs

Introducing the all new Chrysler Sebring.

Precisely engineered, with 45 standard safety and security features, a powerful 3.5 liter v6 engine.

It's beautiful inside and out.

Foil Qs

Introducing the latest Chrysler Sebring.

Brilliantly engineered, with 45 standard safety and security features, a powerful 3.5 liter v6 engine.

It's gorgeous inside and out.

Nissan2

True Qs

The Nissan national sales race is on.

That means, record breaking deals on high performing Nissans.

100,000 Nissans, in 1 event, so ladies and gentlemen, get to your Nissan dealer now, and start your savings.

Foil Qs

The Nissan nation wide sales race is on.

11-20 that means, record breaking deals on superior performing Nissans.

21-30 100,000 Nissans, in 1 occasion, so ladies and gentlemen, get to your Nissan dealer now, and start your savings.

Toyota 2

True Qs

A lot of car ads say “save for a limited time.”

So you don't feel just smart the week you bought it, you'll feel smart, period.

Get a brand new Toyota Prius, with 0% APR financing, or lease one, for just 229 a month.

Foil Qs

A lot of car ads say “save for a short time.”

So you don't feel just confident the week you bought it, you'll be confident period.

Get a modern Toyota Prius, with 0% APR financing, or lease one, for just 229 a month.

Toyota

True Qs

Going from 0-60 never felt so good.

Truckers say, fastest from 40 to 70, even better.

And you got yourself, one happy ending.

Foil Qs

Going from 0-60 never felt so amazing.

Truckers say, fastest from 40 to 70, its better.

And you got yourself, one incredible ending.

Acura3

True Qs

This is our art

Our art places form in harmony with function.

Cars are our passion.

Foil Qs

This is our masterpiece.

Our art places unities with function.

Cars are our obsession.

Infiniti

True Qs

Many sport utility vehicles feature a body that's held to a frame by just 10 bolts.

The body and frame of the Infiniti qx4 on the other hand is actually one solid structure held together by over 42 hundred precision welds.

So if you ever wonder why the qx4 drives so solid, it's because it is so solid.

Foil Qs

Many sport utility vehicles feature a unit that's held to a frame by just 10 bolts.

The body and frame of the Infiniti qx4 on the other hand is one solid structure held jointly by over 42 hundred precision welds.

So if you ever wonder why the qx4 drives so stable it's because it is so solid.

Drug Ads

FO3 Dimet

True Qs

When my girls get a cold, I take care of them.

A medicine can't work if your children won't take it.

They love Dimetapp.

Foil Qs

When my girls get sick, I take care of them.

A medicine can't be effective if your children won't take it.

They really like Dimetapp.

Musinex

True Qs

When mucus causes chest congestion and coughing, it can be a late night.

Musinex dm breaks up mucus and quiets coughing.

And mucinex dm lasts for 12 hours.

Foil Qs

When mucus triggers chest congestion and coughing, it can be a late night.

Musinex dm breaks up mucus and lessens coughing.

12 hours of long lasting mucinex.

So3 Exedrin

True Qs

My mother's always giving out medical advice, she said to relieve headaches, you should take exedrin, it's better than Tylenol.

She was right. Major bonding experience with mom.

Plus, I got something that's better for headaches. I mean, what more could you want in life.

Foil Qs

My mother's always giving out medical advice, she said to alleviate headaches, you should take exedrin, and it's much more effective than Tylenol.

She was right. Major quality time with mom.

Plus, I got something that's perfect for headaches. I mean, what more could you want

in life.

Advil 2

True Qs

My new grandson should always feel safe in my hands.

Even after 20 years, nothing has been proven more effective on tough pain.

Advil for arthritis pain. Fast, strong, trusted.

Foil Qs

My new grandson should always feel comfortable in my hands.

Even after 20 years, nothing has been proven more to reduce tough pain.

Advil for arthritis pain. Quick, tough, trusted.

Tylenol 3

True Qs

That is fast.

He's gotta have a bigger carburetor.

New rapid release gels.

Foil Qs

That is quick.

He's gotta have a larger carburetor.

New fast release gels.

Vicks

True Qs

When you feel the first symptoms of a cold use vicks first defense.

It's a new microgel that attacks the cold virus where it starts at the back of the nose.

New Vicks First Defense attack is the best form of defense.

Foil Qs

When you feel the early symptoms of a cold use Vicks First Defense.

It's an advanced microgel that attacks the cold virus where it starts at the back of the nose

Brand new vicks, first defense attack is the greatest form of defense

Questions for evaluation

I dislike the ad.

The ad is appealing to me.

The ad is interesting to me.

The ad is attractive to me.

The brand in the ad is likely to possess the stated ad claims.

I react favorably to the brand.

I feel positive toward the brand.

I dislike the brand.

Questions for arousal

Stimulated, Relaxed

Excited, Calm

Frenzied, Sluggish

Jittery, Dull

Wide awake, Sleepy

Aroused, Unaroused

Questions for sensation seeking

I would like to explore strange places

I like to do frightening things

I would like to try bungee jumping

I love to have new and exciting experiences

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