IMPACT OF COGNITIVE LOAD AND SOURCE CREDIBILITY ON ATTITUDE TOWARD THE AD FOR AFFECTIVE AND COGNITIVE ADVERTISING APPEALS

By

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TABLE OF CONTENTS

page

ACKNOWLEDGMENTS 3

LIST OF TABLES 6

LIST OF FIGURES 7

ABSTRACT 8

CHAPTER

1 INTRODUCTION 10

Need for Present Research 10
Role of the Current Study 12
Research Objectives 14

2 LITERATURE REVIEW 15

Affect and Cognition 15
Affective and Cognitive Appeal Types 17
Affective and Cognitive Responses 19
Attitudes 21
Theoretical Framework 23
Memory and Attention 29
Cognitive Load 30
Source Credibility 33
Direct-to-Consumer Pharmaceutical Advertising 39
Hypotheses and Research Questions 40
Hypotheses 40
Research Questions 42

3 METHOD 44

Experimental Design 44
Procedure 44
Independent Variables 46
Cognitive Load 46
Affective and Cognitive Appeal 46
Source Credibility 46
Dependent Variables 47
Attitudes 47
Product-Related Thoughts 47
Research Stimuli 47

Participants 49

4 RESULTS 51

Pretest Results 51
Main Study Results 53
Scales Used & Reliability Analyses 53
Attitude toward the Ad 53
Source Credibility 54
Elaboration 54
Advertising Appeal Type 54
Cognitive Response 54
Manipulation Checks 55
Hypothesis Testing 55
Exploration of Research Questions 58

5 DISCUSSION 75

Evaluation of the Hypotheses 76
Evaluation of the Research Questions 79
Implications and Limitations 85
General 85
Practical Implications 86
Limitations 87
Future Research 88

APPENDIX

A AFFECTIVE AD STIMULUS 91

B COGNITIVE AD STIMULUS 92

C MAIN STUDY QUESTIONNAIRE 93

LIST OF REFERENCES 99

BIOGRAPHICAL SKETCH 111

LIST OF TABLES

Table		page
2-1	A overview of the labels, definitions, operationalizations, and measurements of various terminologies used in cognitive/affective studies.	43
3-1	Descriptive statistics for pre-test of brand name	50
4-2	Statistical results for hypotheses tests.	63
4-3	Means and standard deviations for research question 2	64
4-4	Statistical results for research question 2.	65
4-5	Descriptive statistics for additional analysis.	66
4-6	Multivariate and univariate results for the effects of independent variables on thought quantity, quality, and valence.	69
4-7	Results of multiple regression.	69

LIST OF FIGURES

Figure page

4-1 Attitude toward the ad for cognitive and affective advertising appeal types. 70

4-2 Mean thought valence for cognitive and affective advertising appeal types. 70

4-3 Attitude toward the ad for low and high source credibility ads. 71

4-4 Mean thought valence for low and high source credibility ads. 71

4-5 Mean attitude toward the ad for low and high source credibility under conditions of low and high cognitive load. 72

4-6 Interaction effects of cognitive load and source credibility. 73

4-7 Interaction effects of appeal type and source credibility. 74

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Using the Elaboration Likelihood Model as a theoretical framework, it was predicted that cognitive load would inhibit the processing of both source credibility information and advertising appeals by type (affective or cognitive). My study tested six hypotheses and two research questions in order to determine the main and interaction effects of cognitive load, source credibility, and advertising appeal type (cognitive or affective) on attitude toward the ad for and cognitive responses to a direct-to-consumer pharmaceutical print advertisement for a meningitis vaccine. This is a highly involving product category that often is advertised using both cognitive and affective advertising appeals. Although prior research has investigated these elements separately or in limited combinations with significant results, my study is the first known study to simultaneously investigate all three. Individual difference variables relating to motivation to process the message were also included in the analysis.

Main effect results for source credibility and advertising appeal type on attitude toward the ad were found, but interactions between manipulated variables were apparent only when individual difference variables were taken into account. My results provide further evidence that attitude toward the ad is comprised of multiple factors, including source, message, and individual

difference variables, and that the processing and impacts of source credibility differ according to these variables.

CHAPTER 1
INTRODUCTION

Need for Present Research

Researchers and advertising practitioners have long been interested in the differing effectiveness levels of various advertising appeals, as well as the responses audiences have toward these appeals. One way in which researchers have categorized advertising appeals is as cognitive or affective, and the choice of which appeal advertisers use is often based on the type of product, as classified by research such as Vaughn's FCB Grid (1980) and further elaborated on by Ratchford (1987). Other similar terms used have been informational and transformational (Puto & Wells, 1984), and emotional and rational (Roselli, Skelly & Mackie, 1995). Often, studies look at only one category of appeals: that is, either cognitive or affective. However, recent studies have been investigating both cognitive and affective appeals or processing types (Leigh, Zinkhan & Swaminathan, 2006; Ruiz & Sicilia, 2004) in one study.

Although advertising appeals can be categorized as cognitive or affective, these labels also identify two possible responses that a consumer can experience when exposed to a message. Several studies have noted differing effectiveness of cognitive versus affective advertising appeals under varying circumstances. For example, Drolet and Aaker (2002) found that congruency with an attitude base which is formed through cognitive or affective means will increase the success of a cognitive or affective appeal, respectively.

Message elaboration and processing have also garnered attention from researchers in recent years. Ad clutter has increasingly become a concern for advertisers, as they seek to break through the barrage of communication aimed at consumers in order to make their messages noticeable and memorable to the intended target. Although the traditional idea of clutter has been considered in terms of a variety of ads and messages, the combination of which induce the

viewer to tune out all but the most striking of communications, the availability of cognitive resources on the part of the individual viewer must also be considered. Many psychologists believe that the limited cognitive resources humans have can be attributed to a processing structure called the working memory.

Working memory is a theoretical concept which may help explain why high cognitive load is deleterious to message comprehension and response by describing processes in the brain which interpret and work with inputted information. Baddeley and Hitch (1974) proposed a multi-component model of working memory that is "limited in capacity and operates across a range of tasks involving different processing codes and different input modalities" (Baddeley, 1986, p. 35). Evidence of the existence of this multi-component model of working memory was provided through experiments using concurrent tasks such as repeating numbers, which demonstrated that simultaneous tasks reduce participants' ability to perform other cognitive tasks (Baddeley & Hitch, 1974; Baddeley, 1986). Therefore, when the cognitive resource level required to process a message is not available due to other cognitive resource requirements, comprehension and memory of the message will likely suffer.

Rumbo (2002) tied the concepts of clutter and cognitive load together by his statement, "This daily regimen of advertising messages may exceed the information-processing abilities of most consumers, requiring them to filter out excess visual and aural marketing stimuli" (p. 128). Considering the environment and situations of the majority of individuals who receive advertising messages, it is imperative to contemplate the effects of decreased cognitive resource availability and increased working memory taxation on responses to commercial messages.

Research in consumer behavior decision making (Shiv & Fedorikhin, 1999) has demonstrated that when under conditions of high cognitive load, participants are likely to make a

consumer behavior decision based on affective qualities of the choices rather than cognitive qualities of the choices. Their results also indicated that these results were much stronger for real (actually present) versus symbolic (photographed) choices, which agrees with prior research noting stronger reactions to more vivid, real choices than to photographs (Mischel & Moore, 1973; Loewenstein, 1996).

Insufficient cognitive resources notwithstanding, source credibility is another issue facing advertisers. Usually considered as having the components of trustworthiness and expertise, source credibility has been discussed as being a determining factor in attitudes toward the advertisement and brand, as well as purchase intention. The effects of source credibility, however, are not always clear, and much research has focused on the effects of source credibility when paired with other factors. In many instances, source credibility shows an interaction effect with other message, source, and audience characteristics (for example, Sternthal, Phillips & Dholokia, 1978; Hovland, Lumsdaine & Sheffield, 1949; Petty & Cacioppo, 1984; Kahle & Homer, 1985), which complicates researchers' efforts to understand the effects of this issue. Research including source credibility as a variable alongside other important advertising elements would be helpful.

Role of the Current Study

With the important issue of increasing numbers of distractors in the environment, understanding how differing advertising appeals can influence consumers will be directly beneficial to both the researcher and practitioner arenas. The current study aims to meld the concepts of advertising appeal type (cognitive versus affective), source credibility (high and low), and cognitive load in order to investigate the effects of these variables in tandem on attitude toward a direct to consumer (DTC) pharmaceutical advertisement. Although these topics have been researched separately or in some combinations in other studies, they have yet to

be combined together in one study, which leaves a substantial gap in the knowledge in this area. Furthermore, DTC advertisements provide for interesting experimental stimulus materials for a study involving the above mentioned variables, as content analyses have shown that DTC ads typically include high levels of both cognitive and affective appeals (Frosch, et. al. 2007) and are highly involving as a health and medical product (Ratchford, 1987; Vaughn, 1980).

The combination of these variables into the present research study is beneficial as variations in cognitive load could lead to differences in the evaluation of cognitive and affective appeal types by people who are viewing ads either high or low in source credibility. Individuals who perceive an advertising message as originating from a credible or non-credible source may exhibit differences in their attitudes toward the advertisement depending on their level of cognitive resource availability due to limitations of working memory. According to the Elaboration Likelihood Model (Petty & Cacioppo, 1986), individuals who do not have the ability to process advertisements will utilize peripheral cues to form attitudes and make choices. Both source credibility and affective aspects of advertisements (such as pleasant images or music) are often deemed as peripheral cues, but which will become more influential to attitude toward the ad under conditions of high cognitive load remains to be seen. Cognitive information should be more persuasive than affective aspects for a high involvement product (Vaughn, 1980). Whether informational appeals remain influential under high cognitive load, and whether source credibility would have any additional impact on an informational advertisement under these circumstances, would lead to better understanding of how these controllable aspects of advertising can best be combined for optimal effectiveness in a variety of cognitively demanding situations.

Research Objectives

My study measured attitude toward the advertisement and cognitive response while manipulating cognitive load, source credibility level, and advertising appeal type. The results of the current study can potentially add to the knowledge in this area in several ways. First, by determining if non-food product advertisements can elicit similar responses as the Shiv and Fedorikhin (1999) study which used both real and symbolic presentations of food in order to induce consumer behavior choice. In my study, symbolic communication was investigated, since advertisements offer representations of the product rather than the actual product. In addition, this study aimed to provide further information concerning the effects of source credibility in different advertising situations. Lastly, the variable of cognitive load was introduced to determine what effect, if any, interrupting the advertising evaluation process of both cognitive and affective ads would have on individuals who view an ad from a source either low or high in credibility.

CHAPTER 2
LITERATURE REVIEW

Affect and Cognition

The term cognition involves reasoning, evaluations, and beliefs (either positive or negative) about an attitude object (Fabrigar & Petty, 1999), or "appraisals, interpretations, schemas, attributions, and strategies" (Berkowitz, 1993, p. 12). These can be considered to be thoughts that occur when a person experiences any stimulus (Yoo & Kim, 2005). Cognitive responses to ads include counterarguments and source derogation, which are negative responses, and support arguments and source bolstering, which are positive responses (Batra & Ray, 1986; Wright, 1973). Cognitive responses are typically more deliberate, analytic, and rational than affective responses. They are less automatic than affective responses and tend to be considered a higher order process (Berkowitz, 1993; Epstein, 1993; Hoch & Loewenstein, 1991). Fishbein and Ajzen (1975) proposed that attitudes were formed through cognition only, although other researchers have pointed out the importance of affect (Holbrook & Batra, 1987; Trafimow & Sheeran, 1998).

Traditionally, cognition has received the most research attention, so currently less is known about affect, although that trend is changing. Affect has been described as emotions or sentiments in reaction to an attitude object (Fabrigar & Petty, 1999). These can be considered as feelings brought about by exposure to a stimulus. Affective responses tend to occur rapidly upon exposure to a stimulus (Zajonc, 1980), are automatic, and are lower order, which means that their formation does not require the use of significant cognitive resources. More recent research has entered the realm of neuroscience to broaden the understanding of affect. Damasio (1994) demonstrated that the control of emotions and the control of cognitions can be separated, for example by injury to the brain. In 1995, LeDoux found that the emotion of fear is processed, not

necessarily with any cognitive input, in a part of the brain called the amygdala, which has traditionally been of interest to cognitive neuroscientists. Davidson (2000) presented a review of recent neuroscience research and advocated for the inclusion of emotion alongside cognition research.

In the 1970s and before, advertising research revolved around the cognitive reactions to advertisements (for example, Greenwald, 1968; Wright, 1973), but the 1980s brought researchers who were interested in introducing affective response research to the body of knowledge (for example, Batra & Ray, 1986). Since then, much research has been undertaken in the areas of affect (how a person feels and the emotions they experience about an object) and cognition (the thoughts or beliefs a person has about an attitude object) and researchers have sought to explain how these concepts influence attitudes.

In studies concerning primarily affect, cognition is often discussed at least to some extent in the literature review, and vice versa (for example, Batra & Ray, 1986; Drolet & Aaker, 2002; Edell & Burke, 1987), and in recent studies, researchers have been studying affect and cognition in tandem rather than separately, which indicates the growing importance of investigating these two concepts together in one study. Several researchers have discussed the likelihood that attitudes are actually influenced by both affective and cognitive aspects of the attitude object (Breckler & Wiggins, 1989; Zanna & Rempel, 1988), and research has shown that the affective and cognitive elements of attitudes often correlate strongly with each other (Breckler & Wiggins, 1989). However, studies have also demonstrated that affect and cognition influence attitudes in different manners and through different mechanisms (Abelson, Kinder, Peters & Fiske, 1982; Stangor, Sullivan, & Ford, 1991). Recent studies have moved past that debate and typically consider affect and cognition to operate together in the development of attitudes. Much research

now concentrates on whether, and under what circumstances, affect or cognition plays a stronger role in attitude formation. Although many researchers do focus on affective and cognitive processing and responses, other studies concentrate on how advertisers can use affective or cognitive appeal types to activate those responses.

Affective and Cognitive Appeal Types

Although affective and cognitive responses to stimuli, including advertisements, have been the basis of much research, affect and cognition can also be utilized to classify communication strategies and persuasive attempts. Research has also been conducted in this area. Some early studies in the area of affect and cognition have investigated the classification of communication (speeches) aimed to persuade as affective or cognitive (Becker, 1963; Ruechelle, 1958). Roselli, Skelly, and Mackie (1995) addressed a lack in the research on affective appeals and investigated differences in the processing of rational versus emotional messages about animal testing under conditions of strong or weak arguments. One hundred arguments were pretested by a group of 26 participants, who rated them on a nine=point scale where 1 equaled "statement appeals to emotions/feelings" (p. 170) and 9 equaled "statement appeals to facts/information" (p. 170). Importantly, another pre-test determined that neither the emotional nor the rational arguments provoked a positive or negative mood. The results of their study showed that rational message responses followed traditional views by cognitive elaboration models, and did elicit more cognitive than affective responses. Furthermore, any affective responses that did occur in response to rational messages were not helpful in forecasting argument acceptance. The authors described two distinct ways that emotional appeals may be processed. The cognitive evaluation of the message may be overshadowed by emotional content in the message, or (based on their evidence the authors suggested the next

possibility was more probable) emotional appeals might influence persuasion separately from cognition.

The differences between cognitive and affective characteristics of ads have also been the subject of research (Leigh, Zinkhan, & Swaminathan, 2006). These researchers looked at predictor variables of cognitive (defined as "characteristics that would promote cognitive elaboration", (p. 108)) and affective ad characteristics (which "relate to an ad's ability to attract attention", (p. 108)). The cognitive aspects included meaningfulness, length of exposure, and product positioning whereas the affective aspects consisted of attractiveness, quality of copy execution, and ability to predict ad content and structure.

The general concepts of affect and cognition have not always been researched and reported under those labels, (Figure 2-1). Early work by Puto and Wells (1984) explained the differences between affect and cognition based appeals in terms of informational and transformational advertising, and this provides an additional way of classifying the appeal types in advertisements. These authors defined informational advertising as presenting relevant, important, and easily authenticated facts and information, and considered this type of advertising to be mainly a cognitive appeal. Transformational advertising, on the contrary, was described as largely affective and experiential in nature; that is, it enables the audience to more vividly imagine the usage of the product. Puto and Wells went so far as to articulate that transformational advertising "must connect the experience of the advertisement so tightly with the experience of using the brand that consumers cannot remember the brand without recalling the experience generated by the advertisement." (p. 638). The authors also proposed that in order to be effective, an ad must be informational, transformational, or incorporate elements of both.

Scales measuring informational and transformational aspects of ads were developed and validated by Puto and Wells (1984), and used by subsequent researchers as well (for example, Edell & Burke, 1987). Examples of the informational scale items include: "I learned something from this commercial that I didn't know before about (this brand)" and "I would have more confidence in my ability to judge the merits of buying (this brand) now that I have seen this commercial". Examples of the transformational items include: "I would like to have an experience like the one shown in the commercial" and "It's hard to put into words, but this commercial leaves me with a good feeling about using (this brand)". A summary of the labels, definitions, operationalizations, and measurements used in research in this area can be examined in Figure 2-1. Many different methods have been utilized to manipulate cognitive versus affective advertising appeals, but oftentimes the manipulation of cognitive versus affective appeals also leads to changes in other aspects between the ads, even including the product of focus in the ad, which drastically increase the chances of confounding effects. One way to circumvent this problem would be to research ways of changing only the copy of an ad in order to manipulate the cognitive versus affective orientation of the ad, while keeping the product, design, and images equal across conditions.

Affective and Cognitive Responses

Individual differences in cognitive and affective processing styles, alongside the type of message appeal, have also been the topic of research (Ruiz & Sicilia, 2004). In this study, informational, emotional, and informational-emotional advertisements were used and the tendency of individuals to use cognitive, affective, or a combination of the two to evaluate information was measured. The study hypothesized that when the ad is informational, the ad will be more appealing to individuals who are high in Need for Cognition, and that when the ad is emotional, it will be more appealing to individuals who are high in a measure called

Preference for Affect, which was developed by Sojka and Giese (1997). The study also discussed individual difference classifications into four groups depending on whether an individual tends to process with high or low affect and high or low cognition. The four groups include Feeling processors, Thinking processors, Passive processors (individuals who are low in both Affect and Cognition processing) and Combination processors (individuals who are high in both Affect and Cognition processing). In agreement with their hypotheses, the authors found that the individual difference of processing type does affect consumer responses in the predicted direction. That is, individuals who scored as Feeling processors responded with more positive attitudes toward the brand, more positive purchase intentions, and chose the advertised brand more frequently when they are exposed to an ad which is more emotional in nature. On the contrary, individuals who were Thinking processors responded more positively in terms of brand attitude, purchase intention, and brand choice to advertisements which were more informational in nature.

In a similar vein, Fabrigar and Petty (1999) studied cognitive and affective bases of attitudes and the increased effectiveness of persuasive appeal congruency (for example, cognitive attitude basis with cognitive persuasive appeal) versus incongruency (for example, cognitive attitude basis with affective persuasive appeal). Drolet and Aaker (2002) further found that the increased effectiveness of persuasive appeals congruent with the attitude basis occurs mostly for brands that individuals associate with affective attitudes. In addition, that study suggested that cognitively based attitudes may be less prone to being changed by persuasion since cognitive attitude bases are more specific than affective attitude bases. Cognitive aspects of a product (in their study, Head & Shoulders shampoo) which were either targeted and highly related to the product (how the product removes flakes and leads to healthy hair), or mistargeted and rated as

not congruent with the product (how the product produces shiny hair) were presented to participants who had an unfavorable pre-test attitude toward the product. Descriptions of the product which utilized the mistargeted characteristics were more persuasive under a low cognitive load condition, although this effect was diminished when participants were experiencing high cognitive load and therefore were unable to fully process the message.

Attitudes

One frequently measured response to messages and stimuli materials is the resultant attitude. The tripartite theory proposed that attitudes are comprised of affect, cognition, and behavior (Smith, 1947). According to a review by Fabrigar, MacDonald and Wegener (2005), an attitude was defined as feelings toward an attitude object (Rosenberg & Hovland (1960), as cited in Fabrigar, MacDonald & Wegener, 2005) cognition was defined as beliefs concerning the attitude object, and behaviors were defined as actions engaged in response to the object. As described earlier, cognitive evaluation consists of analytically thinking about the message, whereas affective factors include concepts like emotions, moods, and other feeling states. They can occur somewhat equally, or one may become more influential than the other in the formation of an attitude, depending on situational and individual variables. Rather than discussing attitudes as being comprised of the three factors of affect, cognition, and behavior, several different recent theorists have posed the idea that attitudes are the summary evaluation of information provided by those three parts (Fabrigar, MacDonald & Wegener, 2005).

Attitudes toward the ad, product, or brand are a widely measured dependent variable in advertising research. Attitude toward the ad, which is the focus of the current study, is a concept which mediates the relationship between advertisement viewing and attitude toward the brand or purchase intention (MacKenzie & Lutz, 1989; Mitchell & Olson, 1981) and attempts to measure a response valence of an individual to a specific advertisement during one precise point in time

when that advertisement is being viewed (Lutz, 1985; MacKenzie & Lutz, 1989). In a typical attitude toward the ad model, usually studied under experimental conditions, attitude toward the ad impacts attitude toward the brand (possibly through classical conditioning, with a positive attitude toward the ad leaving the viewer in a positive mood state (Shimp, 1981)), which then influences purchase intention (Lutz, MacKenzie, & Belch, 1983). The connection between attitude toward the ad and attitude toward the brand has shown to be stronger in circumstances where the brand is less familiar (Burke & Edell, 1986; Machleit & Wilson, 1988). Shimp (1981) believes that attitude toward the ad is comprised of both affective and cognitive components and that it is an important mediator to brand choice, which illustrates the importance of attitude toward the ad alongside other measures of advertising effectiveness. In addition, Haley and Baldinger (1991) suggested that advertisement liking (which is similar to attitude toward the ad) is a strong predictor of sales among constructs which are influenced by advertising.

Even with that relatively focused definition of the type of attitude to be investigated in the current study, attitudes are much more complex than might be considered at first glance. For example, as discussed in MacKenzie and Lutz (1989), many aspects of the advertisement, viewing situation, and individual audience member weigh in to result in the measurable attitude toward the ad. Attitude toward the brand is the result of a wider set of variables including prior brand attitudes and experiences, and is therefore more complex in nature. Consumer choice, by comparison, is broader than attitude toward the brand, and its formation relies on additional marketing aspects.

In a more general sense, components of attitudes that have been the focus of past research include attitude strength, complexity, and certainty, among others (Fabrigar, MacDonald, & Wegener, 2005). The authors noted that these various attitude components are highly correlated

with each other, and impact persuasion differently according to the level of elaboration a person is using.

Attitude strength is possibly the most well-known attitude characteristic, and is considered to be comprised of many characteristics, such as persistence, ability to withstand change, and the level to which it impacts thought and behavior (Petty & Krosnick, 1995).

Attitude certainty is a measure of how sure an individual is that his or her attitude is correct (Gross, Holtz, & Miller, 1995) and previous studies have demonstrated that higher attitude certainty leads to stronger attitudes, which in turn are more enduring, are more indicative of eventual behavior, and are more resistant to change when challenged (Petty & Krosnick, 1995), all of which are attributes helpful to marketers and advertisers.

Attitude complexity is a term describing that an attitude may be based on or linked to only a few or multiple perspectives (Fabrigar, MacDonald & Wegener, 2005). Higher attitude complexity tends to result in more resistance to change (Wood & Kallgren, 1988).

Attitude accessibility refers to how quickly and easily an object's evaluation occurs once encountered (Fazio & Williams, 1986). The level of automaticity of the evaluation is determined to some extent by the frequency with which the object is encountered. This component of attitude can be measured through response latencies. Attitudes which are more accessible are more difficult to change than attitudes which are less accessible (Fabrigar, MacDonald & Wegener, 2005).

Theoretical Framework

Two dual process models that can be used to predict the effects of ability and motivation to process messages are the Elaboration Likelihood Model and the Heuristic-Systematic Model.

The Elaboration Likelihood Model (ELM) consists of two different tracks, depending on the motivation and ability of the individual to process the message (Petty & Cacioppo, 1986). The first consideration in which of the two ELM tracks will be followed is whether the individual is motivated to process the presented information. If not, the peripheral route will be used and if cues such as source characteristics or other issues or information relevant to the worth of the communication are present, attitude may be altered temporarily. If no central or peripheral information is available, the initial attitude will remain. If there is sufficient motivation to process a message, the ability to process that message must then be considered in determining whether the central route to persuasion will be adhered to.

Individuals who are highly motivated to process a message may not have the ability to fully process the message due to environmental or psychological distractions, comprehension issues, or a low familiarity with the message topic, for example. If individuals are motivated but not able to process the message, the peripheral route will be followed as long as peripheral cues are present. When individuals lack either the motivation and/or ability to fully process messages, there will be little or no thought involved, and the peripheral route will be employed, meaning that characteristics not directly relating to the message content will be influential in attitude formation.

The ELM predicts that when messages are processed through the peripheral route, attitudes will be less durable (Petty, Haugtvedt, & Smith, 1995) and less able to predict future behavior than attitude changes through the central route (Petty & Cacioppo, 1983). However, when motivation and ability are high, elaboration likelihood will be high, and information will

most likely be processed through the central route, which means that the main message will be analyzed extensively and thoroughly, with the individual producing thoughts related to the experienced information. This type of processing is likely to lead to enduring attitudes that are predictive of future behavior. The ELM is largely a cognitively based model and considers affect to be of secondary importance to cognition when relevance and motivation are high, indicating that under these circumstances, cognition would determine persuasion (Petty & Cacioppo, 1986).

The ELM does give affect a place in the peripheral route, when motivation, opportunity, and/or ability are low. Petty, Cacioppo, Strathman, and Priester (2005) remarked that comprehension of the ELM is based on understanding what would hypothetically happen at each extreme, although rarely is a decision made at the endpoints of the continuum, where extreme high and low effort are depicted. By identifying the elaboration level consumers in a given situation are likely to have, researchers can use the ELM is make recommendations for more effective consumer communications (Rucker & Petty, 2006).

The Heuristic-Systematic Model (HSM) is another dual process model (Chaiken, 1987) which provides predictions according to message factors and level of processing. In this model, information can be processed in a systematic way, which is similar to the central route of the ELM; the message is processed analytically and the useful and helpful information is used in forming an attitude. Information can also be processed heuristically, which corresponds to the peripheral route in the ELM; information is processed in a limited fashion and less analytically. People who have the cognitive resources to process the information will look at relevant,

important message information and others will not, but instead will be persuaded by less relevant message characteristics (Todorov, Chaiken & Henderson, 2002). This model suggests that people who are heuristically persuaded may actually be unaware that they have been persuaded.

According to the ELM, either central or peripheral processing will occur. However, unlike the ELM, the HSM also provides an explanation for how both the systematic and heuristic processing levels can co-occur to help the individual form an attitude. Specifically, if the heuristic and systematic pathways have led to the same conclusions about an object, the effect will be combined. However, if the processing has resulted in contrasting inferences, the systematic processing route weakens the effect of the heuristic processing. There are three possible ways that the heuristic and systematic processes can interact with each other: the additivity hypothesis, the attenuation hypothesis, and the bias hypothesis. The additivity hypothesis occurs when there is consistency between the heuristic cues and the arguments supplied. On the other hand, the attenuation hypothesis results when the systematic and heuristic information are in disagreement; in this case if the individual is properly motivated, the systematic information will win out. Lastly, the bias hypothesis occurs if the message is ambiguous, meaning that it has both strong and weak arguments. In this case, a heuristic cue previously experienced (for example, a suggestion of high source credibility) will influence the way the message is construed, even if the viewer is highly motivated to seek accuracy.

Another difference between the ELM and HSM is that whereas the ELM assumes individuals are motivated to look for truth and accuracy, the HSM proposes three principal incentives for the processing of information: accuracy motivation in which people simply want

accurate information, defense motivation in which people want to maintain their current attitude, and impression motivation, in which people want to hold and express attitudes that are socially desirable in a particular situation.

The Cognition in Persuasion Model (CPM) is another, newer model which would make some predictions about ability and motivation to process information (Albarracin, 2002). This model differs from the ELM and HSM in that it provides for one multi-stage process to predict persuasion, rather than a set of two potential processing routes as in the ELM and HSM. However, the CPM does provide distinct stages of persuasion and attitude formation, and also makes more specific predictions about a more moderate level of processing.

The CPM has led to research which predicts that beliefs can be used to form attitudes under conditions of adequate cognitive resources, but if the cognitive resources are not available, attitudes will be formed through affect. Albarracin and Wyer (2001) demonstrated that distracted participants form attitudes based on affect generated by a message rather than the message substance itself. The CPM describes a sequence of five processing phases that occur when an individual encounters a persuasive attempt (Albarracin, 2002). During the first stage, information is processed semantically in the "permanent memory" (p. 629). Stage two involves the individual choosing information with which to either corroborate or rebut the presented argument. In stage three, the most pertinent pieces of information with which to form an opinion are chosen. During the fourth stage, the information from stage three is used to form an evaluation, which may alter the original attitudes or behavioral intentions of the individual. In stage five, action based on the attitudes and intentions from stage four may occur.

The CPM posits that the same sequence of events will occur apart from the level of motivation and ability of the individual processing the message. However, this model suggests that different sets of information would be used by people under varying levels of motivation and ability, and that moderate levels of motivation and ability would lead to the use of moods as determinants of attitude.

The current study will use the ELM as a framework. The ELM was chosen for two main reasons. First, the methodology of this study is not likely to encourage a motivation other than accuracy motivation; participants will be answering the questions anonymously and by themselves, so an impression motivation is unlikely. The brand to be used in the experiment will be unfamiliar to all of the participants in the study, which means that they will not have prior attitudes toward the product. This will eliminate most any defense motivations that might otherwise occur. Secondly, the manipulation of cognitive load in this study is meant to separate respondents into two groups: one group which has the cognitive resources to process a message fully and one group which has limitations in their cognitive resource availability due to their engagement in other cognitive tasks. A model which provides a third option of both heuristic and systematic processing together would not allow for clear predictions in the various cells of the experiment. The CPM suggests that the process will be the same regardless of motivation and ability but different information will be used. This theoretical model would be more helpful if all participants were looking at the same ad, but problematic for making predictions for differences in the effectiveness of cognitive and affective advertising appeals.

The ELM makes predictions about how deeply a message will be processed based on an individual's motivation, opportunity, and ability to process that message. An individual's memory about a message as well as the level of attention afforded to that message are implications of the pathways of this model. An overview of these topics will now be presented.

Memory and Attention

Craik and Lockhart (1972) offered the first major conceptual departure from the three store (sensory, short term, and long term) model of memory. Their paper suggested that perception levels can be lower or higher. The lower levels encompass more general details such as color, volume, and other highly noticeable physical characteristics. Higher levels of processing are a deeper processing and involve things like associations to prior knowledge and elaboration about the input.

In the new framework, memories and memory trace are hypothesized to be related to how deeply the material is processed. For example, memory would last longer if the stimulus was thought about more and associated with other things in the memory, than if just a cursory processing of physical details occurred. This model suggests that items processed more deeply will be retained longer and forgotten more slowly than material processed more shallowly.

Working memory is a concept to describe the transitory storage and processing of information and has received increasing attention in the literature, a trend away from the use of the term "short term memory". According to the multi-component model of working memory (Baddeley, 1986; Baddeley & Hitch, 1974), working memory consists of a visuo-spatial sketch pad which is responsible for visual information and a phonological loop, which is responsible for

auditory information processing. These two "slave systems", as they are called, are controlled by another component of working memory called the central executive.

Baddeley and colleagues proposed and refined an additional component to the multi-component model of working memory, the episodic buffer, which integrates visual, auditory, and spatial information into a single episodic representation (Baddeley, 2000; Repovs & Baddeley, 2006). Working memory is bounded in terms of capacity and also differs among individuals, but one of the questions that remains is whether there exists one amalgamation of combined resources from which each component draws, or whether each component operates from its own, smaller set of resources (Bruning, Schraw & Ronning, 1999). Baddeley's assumption is that the latter is the case, and that therefore, for example, tasks involving visual stimuli should not be affected by tasks involving aural stimuli, under conditions of typical information processing load.

Since working memory by nature includes restrictions in terms of how much an individual can process at any given time, requesting that an individual engage in more than one task at a time, even if the tasks are comprised of distinct modalities (for example, listening and reading) will likely lead to shifts in attention from one task to another, and decreased performance on one or more of the tasks. Attention is the cognitive process of apportioning available cognitive resources to certain tasks over others. It becomes necessary to study attention due to the fairly limited nature of the human mind to process information and engage in multiple tasks simultaneously.

Cognitive Load

Since humans have far from unlimited cognitive resources, as discussed above, available resources are often conserved when possible and must be allocated to different stimuli at varying degrees when more than one item must be processed. As our environment has become more

complex, including with increasing numbers of persuasive messages, it has become increasingly difficult for us to process all of the messages to the degree required to understand them.

The Elaboration-Likelihood Model posits that when individuals have more motivation and/or ability to process a message, they will engage in central route processing, in which they think more in depth and elaborate more about a message (Petty & Cacioppo, 1986). The ability to engage in more effortful and effective processing may be hampered by internal or environmental factors that tie up cognitive resources, a notion suggested by an outgrowth of the ELM, the cognitive resource matching (CRM) hypothesis (Keller & Block, 1997). The CRM states that persuasion attempts are most effective when the level of cognitive resources required to process the message match the level of cognitive resources available to the individual processing the message.

The amount of cognitive load experienced by an individual can be a result of the natural environment or induced with various cognitively oriented tasks. There is not one method of manipulating cognitive load that has dominated the research in this area. Several previous studies have used memorization of long (short) digit strings in order to manipulate high (low) cognitive load (Gilbert & Hixon, 1991; Tormala & Petty, 2004b). Other studies have utilized word list (Drolet & Luce, 2004) or even artwork (Ward & Mann, 2000) memorization. Differences in cognitive load (and therefore the ability of cognitive resources not used up by the number memorization task) have been shown to bring about differing levels of attitude certainty after exposure to an expert source providing a counter-attitudinal message. Lower levels of cognitive load have been demonstrated to lead to increases in attitude certainty (Tormala & Petty, 2004b). In addition, a fascinating interaction between source credibility (specifically source expertise) and cognitive load emerged in the same study such that cognitive load was only

related to high attitude certainty when paired with a high credibility source. When looking at low cognitive load situations, attitude certainty was higher with the high source expertise condition, whereas in the high cognitive load condition, attitude certainty was elevated with a low credibility source. The authors explained these findings by pointing out that the higher cognitive load condition may have brought about lower levels of confidence about the ability to resist the message, especially when that message originated from a high credibility source, which may then have resulted in lower attitude certainty scores.

Research in consumer behavior has found that when two alternatives are provided to an individual under high cognitive load, negative affect tends to result and the alternative which requires less cognitive work to process and evaluate is chosen more frequently (Garbarino & Edell, 1997). The authors suggest that the phenomenon they tested is known as process-induced affect. This may happen because the negative affect generated by the high cognitive effort required to assess the alternatives may become integrated into the assessment of that attitude object. Research by Shiv and Fedorikhin (1999) further showed that under circumstances of high cognitive load, as manipulated by having participants memorize a seven-digit number, participants chose a snack based on affect rather than cognition. The authors explained that when too few processing resources are allocated to a task, that affect was the deciding factor in which item to choose. These results were only apparent when participants were exposed to the real choices and not when they merely saw photographs of the choices. However, this may be due to the affective nature of food, as food has been found to be evaluated mainly via affective means (Letarte, Dube, & Troche, 1997). However, in that situation the choice to be made was between two different foods. Letarte, Dube and Troche (1997) found that foods are assessed mostly through their affective features, particularly from sensory encounters. Research on

cognitive load in psychology demonstrated a phenomenon of disinhibited eating under condition of cognitive load in individuals who normally were restrained eaters (Ward & Mann, 2000). In this study, cognitive load was manipulated by instructing participants that they would either be engaging in an artwork memorization task or in a response time measurement. These authors did not discuss the possibility that the disinhibited eating could relate to choosing to eat based on affect rather than cognition. However, the natural, affective reactions elicited by food could have an impact on the results of that study, so research using less sensory oriented items in advertisements would provide important clarifications and indications as to how these results can be interpreted and extended.

Source Credibility

Whereas cognitive load affects message processing by its effects on the receiver or audience member, source credibility is typically manipulated in or alongside the message. Source credibility is the level of perceived reliability of a message source for accurate and honest information (Kelman & Hovland, 1953). Two separate concepts are often used in source credibility literature. Source expertise is considered a source's ability to provide correct information (Rhine & Severance, 1970), whereas source trustworthiness takes into account a source's intention and willingness to provide accurate information (Mills & Jellison, 1967). Some researchers have also argued for the inclusion of attractiveness in source credibility definitions (for example, Baker & Churchill, 1977; Ohanian, 1990).

Some of the earliest source credibility work was done by Hovland and Weiss in 1951. These researchers found no difference in the amount of information obtained by participants exposed to low or high credibility messages, as demonstrated by quiz scores across conditions. However, opinion differed among the low and high credibility groups. High credibility sources led more often to opinion change in the advocated direction, whereas no such effect was seen for

low credibility sources. Participants were tested four weeks after the initial exposure. Once again, the amount of information retained did not differ between low and high credibility groups, but the opinion change result was intriguing. After the four week delay, participants who were exposed to the low credibility source showed a positive increase in opinion, and participants who had been exposed to the high credibility source showed decreases in opinion. This phenomenon had been termed the sleeper effect in earlier research (Hovland, Lumsdaine & Sheffield, 1949), and the authors discussed its possible connection to recall of the source, which was especially deficient in the very group that had exhibited sleeper effect results (that was, participants who had initially been in disagreement with the position advocated in the message, who were exposed to a source low in credibility and, after a delay, came to agree with the advocated position). Another interesting aspect of this article is that the authors investigated not only their own determinations of low and high credibility sources, but also found similar results based on participants' own interpretations of the source credibility level, whether or not it agreed with the experimenter labels.

In most cases, higher source credibility levels have lead to increased persuasion in research (Petty & Wegener, 1998) and to more positive attitudes toward both the endorser and the advertisement (Braunsberger, 1996), but many effects of source credibility are further refined by interactions with other source, message, or audience characteristics (Sternthal, Phillips & Dholakia, 1978). Walster and Festinger (1962) found that participants who thought that a nearby speaker endorsing a point of view did not notice them were more persuaded by a message; presumably because they thought the speaker did not intend to persuade them.

The type of product featured in an ad is another factor that determines the importance of source credibility. Friedman and Friedman (1979) found that for products carrying a high

physical or financial risk, expert sources were superior to non-expert sources, whereas for products with a higher social or psychological risk, celebrity endorsers were a more effective option. The match-up hypothesis, as discussed in Kahle and Homer (1985) and Kamins (1990) is another consideration in terms of source credibility effectiveness. This match-up hypothesis posits that a logical fit between an endorser and the endorsed product will lead to more beneficial results for the advertisement. Although originally a phenomenon tied into source attractiveness, the match-up hypothesis has recently received additional research attention in the areas of source expertise (Choi & Rifon, presented at the American Academy of Advertising Conference, 2005; Till & Busler, 1998; Till & Busler, 2000). Till and Busler (2000) investigated the effects of attractiveness on attitudes and purchase intentions toward a cologne (a product related to one's attractiveness) and a pen (a product unrelated to one's attractiveness). Although the authors hypothesized a match-up effect, attractiveness led to more positive attitudes toward the brand and purchase intentions for both products. Hence, there was no match-up effect demonstrated. However, the authors conducted a second study using two different product categories; candy bars and energy bars (seen as healthier), and two different sources (identical in attractiveness, as the same photo was used for both), an actor and an athlete. Their research did demonstrate a match-up effect: pairing the athlete spokesperson with an energy bar was a much better fit, and increased brand attitudes (although not purchase intentions) much more, than the incongruent fit of athlete and candy bar. Therefore, those authors found a match-up hypothesis for expertise but not for attractiveness.

Although many studies have focused on endorser or celebrity credibility, some research has investigated other levels of message credibility, such as corporate or message source credibility in general. Stern (1993, 1994) argues that prior research which has looked at source

credibility has not effectively separated out the various components of source credibility that may be present in a single ad, and identifies three such source elements: the sponsor, which is legally and financially responsible for the ad (for example, the company paying to promote its product), the author, which is involved in the actual generation of the ad (such as an advertising agency), and the persona, which is involved in the actual relaying of the message inside the advertisement (a celebrity or other featured endorser).

Lafferty, Goldsmith and Newell (2002) found that corporate credibility, defined as the credibility of a company or corporation, operates separately from and may be more influential than endorser credibility for attitudes toward the ad and brand, and for purchase intention. Their research found that this was especially true for attitude toward the brand, and suggested that endorser credibility may be more related to attitude toward the ad, whereas corporate credibility (also called advertiser credibility (MacKenzie & Lutz, 1989), company credibility (LaBarbera, 1982), or attitude toward the advertiser (Lutz, 1985), was more influential on attitude toward the brand. However, in the current study, attitude toward the ad rather than attitude toward the brand will be measured since there will be no endorser other than the corporation.

Whether an audience member has the motivation, opportunity, and ability to process a message through the central or peripheral route of persuasion (from the ELM) or the heuristic or systematic pathways (from the HSM) also has an impact on the effect of source credibility (Chaiken & Maheswaran, 1994; Petty, Cacioppo, & Goldman, 1981). Although originally heuristic (peripheral) cues were seen as inconsequential when paired with systematic (central) information (Petty & Cacioppo, 1984), Chaiken and Maheswaran (1994) showed that systematic processing of message arguments can be influenced by heuristic processing of source credibility cues when messages were ambiguous in their support for the product. That study placed

participants in either low or high task importance, identified sources as either low or high in credibility, and provided either a strong or weak unambiguous message or an ambiguous (both strong and weak arguments included) message. For low task importance, heuristic processing of credibility determined attitudes, despite whether the message was ambiguous or not, and whether the argument was strong or weak. When task importance was high and the message was unambiguous (including either strong or weak arguments), systematic processing dominated as long as the message matched the credibility cue (for example, if the high credibility source provided a strong argument). When the message did not agree with the credibility cue (for example, if the source high in credibility provided a weak argument), both heuristic and systematic processes were in operation by participants. And lastly, when task importance was high and the message was ambiguous, again, both processes were utilized by participants in attitude formation.

Petty and Cacioppo (1984) also discussed in-depth the effects of varying levels of their concept of elaboration likelihood on utilization of source cues by individuals, as shown by numerous studies. Petty, Cacioppo and Goldman (1981) induced low or high personal relevance in a situation of potential comprehensive exams to graduate college, and attributed the information to either low or high credibility sources. A few years later, Petty, Cacioppo and Schumann (1983) conducted a similar study using advertising messages, and found similar results: In peripheral processing (when elaboration likelihood is low), experts and celebrities are more effective endorsers than non-experts and non-celebrities, respectively (Petty, Cacioppo, & Goldman, 1981; Petty, Cacioppo & Schumann, 1983), whereas in central processing, argument quality influences persuasion regardless of source credibility.

Kiesler and Mathog (1968) found source credibility to be effective only when audience members were being distracted and therefore were unable to fully process messages and arguments (in other words, when they had decreased ability to comprehend the message). Petty and Cacioppo (1984) discussed this finding as demonstrating that not only motivation, but also ability, influences the utilization of source credibility information during message processing. Higgins (1999) hypothesized that under a time constraint, participants would be more influenced by the heuristic cue of source credibility in order to reduce the cognitive load formed by the time constraint. However, analysis of the interaction between the two variables revealed that when time constraints were high, participants did not utilize source credibility as much as they did when time constraints were not in place. Higgins suggested that perhaps when people are under a time constraint, or cognitive load, they resort to cues even simpler than source credibility to assist in message processing.

Although the majority of studies in this area have focused on either high or low elaboration likelihood, other studies have attempted a more intermediate level of elaboration likelihood. This is vital to our understanding of the effects of the elaboration likelihood model on source credibility, as in most real world situations, the extremes of high and low elaboration are rare occurrences on the continuum of the elaboration likelihood model (Petty & Cacioppo, 1984). At levels of moderate elaboration likelihood, the source may assist the audience member in determining how much effort should be expended on message processing (Petty & Cacioppo, 1984). In other words, when, for example, an expert source is presented, a message will be more effortfully processed than when a non-expert source is presented, as was shown by Heesacker, Petty and Cacioppo (1983).

Direct-to-Consumer Pharmaceutical Advertising

Direct-to-consumer (DTC) pharmaceutical advertisements will be the focus of the current research. This type of advertising features pharmaceutical companies appealing directly to consumers rather than to physicians or pharmacists. DTC advertising as we know it today got its start in 1997 when the Food and Drug Administration allowed prescription drug companies to release ads. The first major brand featured was Schering-Plough's Claritin (Arnold, 2007). Since 1997, DTC advertising expenditures have increased steadily, reaching $4.5 billion in 1996. Of that amount, $1.62 billion is spent on network television ads and $1.42 billion on magazines (AdSpender, accessed 2007).

DTC advertising is a controversial topic. Although some contend that this type of advertising improves education and awareness (for example, Weismann, Blumenthal, Silk, Zapart, Newman, & Leitman, 2003), others argue that DTC ads do not provide adequate information and risks and benefits of various medications, and therefore medication decisions are largely put into the hands of relatively uninformed consumers who insist that their doctors prescribe them the advertised medication (Baukus, 2004).

One content analysis of 38 DTC ads found that both rational and emotional appeals are used; more specifically, 86% of the DTC ads in the sample included rational arguments, and 95% included emotional appeals (Frosch, Krueger, Hornik, Cronholm, & Barg, 2007). In other studies, the percentages have not been as high, perhaps due to differences in technique or sample. A content analysis looking specifically at magazine DTC ads (Macias & Lewis, 2006) found that 61% of ads contained a rational appeal, compared to 39% utilizing an emotional appeal. Another content analysis focusing exclusively on DTC television commercials revealed a similar pattern: 59.7% of ads used rational appeals and 40.3% were classified as using an emotional appeal (Macias, Pashupati, & Lewis, in press). With the high incidence of both affective and cognitive

appeals in use, the DTC product category provides an intriguing avenue for investigation of the current research questions concerning advertising appeal type alongside source credibility and cognitive load.

Hypotheses and Research Questions

Based on the preceding review of literature, six hypotheses and two research questions were developed.

Hypotheses

The print advertisements used in the study were Direct to Consumer prescription drug ads. Important health related products such as medications for applicable illnesses are typically placed in high involvement/thinking quadrants in classifications such as the Foote Cone Belding (FCB) grid (Ratchford, 1987; Vaughn, 1980). Attitude toward the ad, which has been found to be an important predictor to attitude toward the brand (Shimp, 1981) and sales (Haley & Baldinger, 1991) and product-related thoughts were the dependent variables of interest. Participants who are highly involved with the product will be more interested in learning about message arguments and information. Since a high involvement product will be chosen,

H1A: Overall, participants who are exposed to cognitive ads will show more favorable attitude toward the ad than will participants who view affective ads.

H1B: Overall, participants who are exposed to cognitive ads will respond with more positive thoughts than will participants who view affective ads.

Hovland and Weiss (1952) found that participants were more likely to change their opinion to concur with the advocated opinion from a source high in credibility rather than a source low in credibility. Studies such as Goldsmith, Lafferty, and Newell (2000) found that endorser credibility had an impact on attitude toward the ad. Therefore,

H2A: Overall, participants who are exposed to ads higher in source credibility will show more positive attitude toward the ad scores when compared to participants exposed to ads lower in source credibility.

H2B: Overall, participants who are exposed to ads higher in source credibility will respond with more positive thoughts than will participants who view ads lower in source credibility.

Garbarino and Edell (1997) noted that participants under high cognitive load who were given choices requiring varying levels of cognitive effort to evaluate selected the choice which required less cognitive effort to evaluate. The authors proposed that this occurred because negative affect resulted from expending higher amounts of cognitive effort to evaluate the more complex alternative. Based on those findings,

H3: Participants who are under low cognitive load will exhibit more positive attitude toward the ad than will participants who are under conditions of high cognitive load.

As cognitive load increases, the amount of resources available to process information will be diminished. Participants in the high cognitive load condition will not have the resources necessary to fully process a cognitively oriented ad, but since cognitive processes aren't required for affective reactions (Zajonc, 1980), they will be able to be reached by an affectively oriented ad. Shiv and Fedorkhin (1999) found that individuals under high cognitive load made a consumer decision based on the affective rather than cognitive qualities of the choices. Therefore,

H4: An interaction between cognitive load and appeal type will be present such that under conditions of high cognitive load, participants will exhibit more positive attitude toward the ad to affective rather than cognitive appeals and under low cognitive load, affective and cognitive appeal types will lead to similar levels of attitude toward the ad.

Yoo and MacInnis (2005) found that attitude toward the ad is brought about through different pathways depending on whether the ad is emotional or informational. Specifically, their study showed that for emotional (or affective) ads, credibility was directly related to

attitude toward the ad; however, for informational (or cognitive) ads, credibility was indirectly related to attitude toward the ad, via the positive or negative feelings brought about by the perceptions of credibility. This result suggests that credibility directly affects attitude toward the ad in emotional ad formats but not informational ad formats. Therefore,

H5: An interaction between source credibility and advertising appeal type will be present such that source credibility will have a larger impact on attitude toward the ad for affective rather than cognitive ads.

Source credibility is often thought of as a peripheral cue in models such as the ELM (Petty & Cacioppo, 1986) and the HSM (Chaiken, 1987). Research has found that for individuals who do not comprehend a message fully due to time constraints, endorsers will be relied upon but in cases where a message is comprehended, source credibility has no effect (Ratneshwar & Chaiken, 1991). However, in certain instances source credibility may affect central or systematic processing (Chaiken & Maheswaran, 1994). Therefore,

H6: An interaction between cognitive load and source credibility will be present such that in conditions of high cognitive load, source credibility will have a larger impact on attitude toward the ad.

Research Questions

Due to the complexities of source credibility including the component parts of expertise and trustworthiness (thought of by some as cognitive and affective components, respectively) (Aaker, Batra, & Myers, 1992), specific predictions regarding a three-way interaction cannot yet be justified. Therefore,

RQ1: What will be the effects of source credibility, cognitive load, and advertising appeal type, when combined, on attitude toward the ad?

Measured variables which are related to the product category and may influence motivation to process the message would also be important to a more full understanding of

responses to specific advertising appeals. It is likely that individual circumstances that increase susceptibility to meningitis will influence participants to have a higher level of involvement with the product. Therefore,

RQ2: What, if any, effects on attitude toward the ad will be present when situational variables relevant to the product category are introduced into the data analysis alongside the independent variables of appeal type, source credibility, and cognitive load?

Table 2-1. A overview of the labels, definitions, operationalizations, and measurements of various terminologies used in cognitive/affective studies.

Authors	**Label**	**Definition**	**Operationalization**	**Measurement**
Leigh, Zinkhan, and Swaminathan, 2006	Affective	"Relate to an ad's ability to attract attention"	Surveyed 90 professionally designed print ads.	Attractiveness, quality of copy execution, ability to predict
	Cognitive	"promote cognitive elaboration" (p. 108)		Meaningfulness, length of exposure, product positioning, ability to predict
Puto and Wells, 1984	Informational	Relevant, important, easily authenticated	N/A	N/A
	Transformational	Affective and experiential, enables audience		
Roselli, Skelly, and Mackie, 1995	Rational	Facts and information	Pre-test of 100 arguments	1 to 9 scale "Statement appeals to emotions and feeling" to "Statement appeals to thoughts and facts"
	Emotional	"Attempts to elicit emotions" (p. 165)		
Ruiz and Sicilia, 2004	Informational	N/A	Stimulus Ads differed in levels of emotion and information elicited Informational = strong + objective Emotional = pleasant picture with no information Informational/Emotional = pleasant picture + strong and objective arguments	Manipulation check: two 7-point scales anchored by none–a lot to measure informational, emotional, or both

CHAPTER 3
METHOD

Experimental Design

A 2 (appeal type: cognitive/affective) × 2 (cognitive load: low/high) × 2 (source credibility: low/high) between subjects experimental design was utilized in order to investigate the above presented hypotheses. Two control conditions were also utilized; participants were exposed to either the affective or the cognitive ad, but were not exposed to the cognitive load manipulation or the source credibility manipulation. Each participant was randomly assigned to one of the eight experimental conditions or one of the two control conditions.

Procedure

In order to keep distractions to a minimum, participants in the main study were invited to take part in the study in groups of approximately 20 outside of their classroom. Participants were given a packet of experiment materials (see Appendix C).

First, the source credibility manipulation took place. Many different source credibility types exist (Stern, 1993), and in this study a general advertisement credibility manipulation rather than an endorser or celebrity was used. In the high credibility condition, the experimenter said, "The version of the ad that you will be viewing in this study has been approved by the Food and Drug Administration (FDA)." In the low credibility condition, the experimenter said, "The version of the ad that you will be viewing in this study has NOT been approved by the Food and Drug Administration (FDA)." Next, the cognitive load manipulation took place. In the high cognitive load condition, participants were instructed to mentally rehearse an 8-digit number whereas in the low cognitive load condition, participants mentally rehearsed a 3-digit number, which was contained in the experimental packet. No participants were observed writing down the number. A time period of 90 seconds was allowed for number rehearsal. Although Tormala

and Petty (2004b) used a period of two minutes (120 seconds), prior experiences with this sample during pre-testing indicated that most participants rehearsed the numbers for approximately 90 seconds before becoming distracted. Therefore, the time allowed for number rehearsal was reduced to 90 seconds to keep participants engaged and interested. The experimenter read the following paragraph, adapted from Tormala and Petty (2004b):

> In research studies, it is important to make situations as real as possible. In your natural environment, you are often exposed to ads and other persuasive communications in busy or distracting contexts. Therefore, we would like you to mentally rehearse the number printed on the next page of your packet while viewing the ad. This technique has been shown in previous research to effectively mimic real-world conditions.

Participants were also informed that they would be given a recall test later in the study. Participants were also reminded to continue rehearsing the number they had seen earlier in the packet, before being told to continue to the next page, which featured the print ad.

After viewing either the cognitive or the affective ad (developed based on Puto and Wells' discussion of informational and transformational (cognitive and affective) ads (1984) and the pre-test reported above), participants turned the page in their packet and were asked to list thoughts they have regarding the product depicted in the ad. Participants were then asked to recall the number they had been rehearsing and were told that they could discontinue their mental rehearsal of the number. As was the case in Tormala and Petty (2004 a,b), the cognitive load was thereby discontinued for the remainder of the study, so that the other dependent measures could be taken without interference from the cognitive load manipulation. Participants then completed attitude toward the ad measures, as well as the cognitive load, source credibility, and appeal type manipulation check questions. Product type/disease familiarity and demographic questions followed. Finally, participants were fully debriefed about the fictitious nature of the product and brand and were thanked for their participation.

Independent Variables

Cognitive Load

The cognitive manipulation was checked in the main experiment using three questions measured on a 9-point scale bounded by "Not at all" to "Very much". The questions included: "To what degree did you pay attention to the information in the advertisement?", "To what extent did you think about the product and the information in the advertisement?" and "To what extent did rehearsing the number take your attention away from reading the information in the ad?". This way of manipulating and measuring cognitive load has been found to be effective in previous studies (Tormala & Petty, 2004b).

Affective and Cognitive Appeal

Manipulation check questions were borrowed from Chaudhuri and Buck (1995) and included six items, measured on a 7 point scale where 1 was "Not at all" and 7 was "Very much" measuring analytic cognition response. The items included the following: "Did the ad make you think of real differences between the brand and its competitors?", "Did the ad make you think of reasons for the brand's superiority?", "Did the ad make you think of the pros and cons of the brand?", "Did the ad make you "think" rather than "feel"?", "Did the ad make you think of arguments for using or not using the brand?", and "Did the ad make you think of facts about the brand?".

Source Credibility

The source credibility manipulation check was measured using a 7-point semantic differential scale developed by Dholakia and Sternthal (1977) with the endpoints of expert-not expert, experienced-not experienced, trained-untrained, trustworthy-not trustworthy, moral-immoral, and good-bad.

Dependent Variables

Attitudes

Attitude toward the ad was measured using four 7-point scales, similar to those used by Zhang and Zinkhan (2006). These scales included the endpoints of unpleasant-pleasant, unlikable-likable, not irritating-irritating, and not interesting-interesting.

Product-Related Thoughts

Participants were asked to list the thoughts they have with regard to the advertised product or ad. The thoughts were coded by two independent, trained coders in terms of quantity and quality, a measure utilized in Tormala and Petty (2004a, b). Coders were paid graduate students in communication. Quantity was ascertained by a straightforward count of the number of thoughts listed. Quality was determined subjectively by each coder in terms of how relevant to the product and effortful in nature each participant's thoughts were. In addition, the overall valence of each participant's collection of thoughts was calculated by subtracting the number of negative thoughts from the number of positive thoughts, similar to the measure of "thought favorability" used by Brinol, Petty and Tormala (2004).

Research Stimuli

The product category used for the experiments was Direct To Consumer (DTC) prescription drugs; more specifically, a vaccination to prevent meningitis. This product category and specific disease were chosen because the study sample is comprised of a population at risk for contracting meningitis, there is a vaccine available for the prevention of this disease, and since meningitis carries significant and serious health risks, it would likely be highly involving for the sample.

Eight fictitious brand names were pretested for brand name familiarity, implied product category benefits, and perceived quality, a technique used in Baker (1999). In order to avoid

fatigue, each participant rated four out of the eight fictitious brand names on the above three characteristics, and descriptive statistics were utilized in order to find the best option for inclusion as the brand name of the stimulus material. Simple descriptive statistics were used to identify the brand name that would be most suitable for use in the study. As outlined in Baker (1999), the ideal fictitious brand name for use in research would be low in name familiarity, low in implied product category benefits, and neutral in perceived quality. The brand name which scored closest to those ideals was Seromax. Therefore, Seromax was chosen as the brand name for the stimulus material. See Table 3-1.

The ads to be used in the study were developed by a senior-level undergraduate student skilled in the use of graphic design software. Research by Puto and Wells (1984) was used to determine what types of information should be included in affective and cognitive appeals. The affective ad included labeled cartoon and photographic images (see Appendix A). A cartoon man was pictured first, worriedly looking at the ground and pacing because he had not received a vaccine against meningitis. Question marks were used to represent individuals who had received a previous vaccine, and therefore were unsure if they would be protected from all forms of meningitis. This was labeled "Previous vaccines". A photograph of a relaxed college student was utilized to signify an individual who had received the advertised vaccine, and this photo was labeled with the brand name. The copy of the affective ad described the risks of not being vaccinated with Seromax in terms of missing social and school activities.

The cognitive ad (see Appendix B) featured a chart outlining the types of meningitis each vaccine option would protect against. An X marked items that a particular option did not protect against, whereas checkmarks signified protection provided by that option. The no vaccine option featured an X for each meningitis type, and was colored red to alert the reader to the danger of

choosing this option. The previous vaccine option was yellow in color, to signify caution, and featured a few of the vaccine types with a check mark next to them, to indicate that some meningitis types would be protected against, whereas others would not. The Seromax vaccine option column was colored green to signify that users of Seromax could continue with their lives worry-free, and featured check marks for each type of meningitis. The copy outlined the health risks of not being vaccinated with Seromax in terms of illness symptoms.

Participants

A total of 524 undergraduate students from a large southeastern university participated in the study for extra credit points. Of these participants, 157 were involved in the pre-testing of the materials and questionnaire, and the remaining 367 were participants in the main study.

Table 3-1. Descriptive statistics for pre-test of brand name.

		Mean	Std. Deviation
Phenelox	Familiarity	4.50	2.15
	Product category benefit	4.33	1.64
	Perceived quality	2.89	1.49
Neopred	Familiarity	5.78	1.52
	Product category benefit	4.89	1.28
	Perceived quality	4.17	1.29
Flexcor	Familiarity	5.00	2.20
	Product category benefit	4.78	1.26
	Perceived quality	4.00	1.41
Roticaine	Familiarity	5.11	2.17
	Product category benefit	5.06	1.26
	Perceived quality	4.44	1.58
Seromax	Familiarity	4.89	2.13
	Product category benefit	4.63	1.50
	Perceived quality	3.37	1.07
Norpamil	Familiarity	5.00	2.05
	Product category benefit	4.68	1.49
	Perceived quality	4.16	1.34
Inderon	Familiarity	5.84	1.61
	Product category benefit	4.68	1.49
	Perceived quality	3.95	1.31
Reglantin	Familiarity	5.53	2.01
	Product category benefit	4.84	1.30
	Perceived quality	3.79	1.22

CHAPTER 4
RESULTS

Pretest Results

Four pretests, consisting of a total of 157 participants, were utilized in the design of the stimulus material and questionnaire.

The first pretest (N=37) included the proposed manipulations for source credibility. Participants were given the following instructions: "Imagine you were in a study in which you would be viewing an advertisement. How credible would you find an ad that you viewed after receiving the following information about it?" and were then rated two statements, "The version of the ad that you will be viewing in this study has been approved by the Food and Drug Administration (FDA)" and "The version of the ad that you will be viewing in this study has NOT been approved by the Food and Drug Administration (FDA)" on a 7-point scale with endpoints "Not at all credible" and "Extremely credible". A paired samples t-test indicated that participants considered the high credibility manipulation statement "The version of the ad that you will be viewing in this study has been approved by the Food and Drug Administration (FDA)" to be more credible (M= 5.89, SD=.62) than the low credibility manipulation statement "The version of the ad that you will be viewing in this study has NOT been approved by the Food and Drug Administration (FDA)" (M=2.19, SD=1.22), $t(35)$=-16.187, p=.00.

The second pretest (N=53) included the proposed manipulation for cognitive load. Although used successfully in previous studies, it was necessary to ensure that the manipulation would work in the current student population. Results of a one-way ANOVA indicated that this manipulation was successful for the current sample. Participants who mentally rehearsed the 8-digit number (M=3.59, SD=1.37) reported paying less attention to the ad than did participants who mentally rehearsed the 3-digit number (M=4.82, SD=1.59), $F(2, 50)$=3.319, p=.044.

Participants who rehearsed the 8-digit number (*M*=3.71, *SD*=1.11) tended to report thinking about the information in the ad less than participants who rehearsed the 3-digit number (*M*=4.24, *SD*=.97), although this difference was not statistically significant. Finally, participants who rehearsed the 8-digit number reported more interference from memorizing the number (*M*=4.59, *SD*=1.84) than did participants who rehearsed the 3-digit number (*M*=1.82, *SD*=1.19), *F*(2,50)=13.298, *p*=.000.

The third pretest (N=30) investigated cognitive load using an additional check of instructing participants to list as many aspects of the ad they could remember. Although the results of the independent samples t-test were not statistically significant, perhaps due to low sample size, participants under high cognitive load exhibited a trend of recalling fewer correct details from the ad (*M*=5.43, *SD*=2.44) than did participants under low cognitive load (*M*=6.00, *SD*=2.16).

The fourth, and final, pretest (N=37), had two purposes: to check the proposed appeal type manipulations, and to check eight fictitious brand names for their usability in the main study. The appeal type manipulation was found to be effective through an analysis of variance; participants who viewed the affective ad (*M*= 2.85, *SD*=1.02) reported lower analytic cognitive responses than did participants who viewed the cognitive ad (*M*=4.79, *SD*=.88), *F*(1,35)=37.984, *p*=.000. Also, participants who viewed the affective ad (*M*=4.74, *SD*=1.37) agreed more strongly with the statement "This ad primarily dealt with feelings generated by the ad" than did participants who viewed the cognitive ad (*M*=2.78, *SD*=1.66), *F*(1,35)=15.37, *p*=.000. Participants who viewed the cognitive ad (*M*= 5.61, *SD*=1.42) agreed more strongly with the statement "This ad primarily dealt with attributes of the product" than did participants who viewed the affective ad (*M*=3.26, *SD*=1.73), *F*(1,35)=20.276, *p*=.000.

Main Study Results

The sample consisted of 367 usable responses once duplicate participant responses and responses from participants who had been involved in one or more of the pretests were excluded (a number of participants completed the study for more than one class; therefore, only their first response was included in the data analysis). Participant age ranged from 18-31 years, *M*=20.12, *SD*= 1.62. 64% (N=235) were female and 34.3% (N=126) were male, with 1.6% (N=6) not reporting their gender. Forty-one different majors were represented in the sample. The most frequently reported major was advertising (N=79) followed by public relations (N=57).

In terms of vaccine history, 26.7% (N=98) reported not having had the meningitis vaccine. 43.9% (N=161) reported having had the meningitis vaccine, and 29.4% (N=108) were unsure whether they had received the meningitis vaccine.

The majority of participants did not have direct experience with meningitis, with 7.1% (N=26) reporting having had a family member or themselves affected by meningitis.

Since meningitis is a higher risk for individuals residing in a crowded living environment, the questionnaire inquired about current living situation. 30% (N=110) of participants reported living in dormitory or another crowded setting.

Scales Used & Reliability Analyses

Attitude toward the Ad

Attitude toward the ad was measured using four items measured on a 7-point scale with endpoints of unpleasant-pleasant, unlikable-likeable, not irritating-irritating, and not interesting-interesting, as utilized in Zhang and Zinkhan (2006). The Cronbach's alpha for these items was .853. Inter-item correlations ranged between r=.49 and r=.65. No increase in the Cronbach's alpha would result from the deletion of any of the scale items.

Source Credibility

The perceived credibility of the source was measured using a 7-point semantic differential scale developed by Dholakia and Sternthal (1977). Items comprising the scale were: expert-not expert, experienced-not experienced, trained-untrained, trustworthy-not trustworthy, moral-immoral, and good-bad. The Cronbach's alpha for these six items was .89, and the inter-item correlation ranged from r=.33 to r=.75. A slight increase in the Cronbach's alpha to .90 would occur if the moral-immoral item were removed from the scale. Since the increase in the alpha by deleting one of the items was minimal, all scale items were kept in the analysis.

Elaboration

Two items adapted from the works of Fitzsimons and Shiv (2001) were used to measure elaboration. These items were: "To what degree did you pay attention to the information in the advertisement" and "To what extent did you think about the product and the information in the advertisement". The Cronbach's alpha for these six items was .89, and the correlation for the two items was r=.74.

Advertising Appeal Type

As outlined in the Method section, the six items measuring advertising appeal type were taken from Chaudhuri and Buck's Analytic Cognition Scale (1995). The Cronbach's alpha for these six items was .82. Inter-item correlations ranged from r=.28 to r=.64. No increase in the Cronbach's alpha would be obtained by deleting any of the scale items.

Cognitive Response

Participants were asked to list any thoughts they had about the product in the advertisement, a procedure which has been utilized in other studies such as Brinol, Petty & Tormala (2004) and Tormala & Petty (2004a, b). This served to measure their cognitive response to the advertisement. Two independent coders rated each participant's thoughts in

terms of the quantity, quality, and valence (number of positive – number of negative thoughts). Correlations of the coder's ratings for quantity (r=.919), quality (r=.880) and valence (r=.938) of thoughts were very strong. This technique for assessing agreement among coders has been used by Tormala and Petty (2004a, b).

Manipulation Checks

Three separate full factorial analyses of variance on the data were performed to determine if the manipulations for affective or cognitive appeal, for cognitive load, and for source credibility had worked. The three manipulations worked as planned. Participants in the high cognitive load condition reported less elaboration about the ad (M= 5.58, SD= 1.54) than did participants in the low cognitive load condition (M= 6.14, SD= 1.37), and this was statistically significant, F = 11.22, p< .01. No other main or interaction effects were apparent. The affective and cognitive appeal type manipulations were also successful. Participants viewing the affective ad reported lower levels of ad-induced thinking (M= 3.04, SD= 1.07) than did participants viewing the cognitive ad (M=4.11, SD=1.30), F(1, 365) = 57.62, p< .01, with no other main or interaction effects present. Participants in the low source credibility condition reported less credibility (M=4.19, SD=1.13) than did participants in the high source credibility condition (M=3.79, SD=1.19), F = 8.48, p<.01 (higher numbers corresponded to lower credibility in the utilized scale). Again, no other main or interaction effects were significant.

Hypothesis Testing

To test all hypotheses as well as the first research question, two separate 2 X 2 X 2 analyses of variance were performed on the data. The independent variables included in the analyses were cognitive load, source credibility, and advertising appeal type. The dependent variable was either attitude toward the ad, or thought valence, depending on the hypothesis.

Hypothesis 1A stated that overall, participants who viewed cognitive ads would show higher attitude toward the ad scores than would participants who viewed affective ads due to the higher involvement nature of the product depicted in the advertisement. The results of the 2 X 2 X 2 analysis of variance with attitude toward the ad as a dependent variable indicate a main effect of advertising appeal type on attitude toward the ad, such that participants who viewed the cognitive ad (M=4.24, SD= 1.28) showed a more positive attitude toward the ad than did participants who viewed the affective ad (M=3.59, SD=1.26), F(1, 299)= 19.403, p=.00. Thus, Hypothesis 1A was supported. Hypothesis 1B proposed that overall, participants who viewed cognitive ads would respond with more positive thoughts in the thought listing task than would participants who viewed affective ads. Hypothesis 1B was also investigated using a one-way analysis of variance. The results indicate a main effect of advertising appeal type on thought valence, such that participants who viewed the cognitive ad (M=1.06, SD=1.81) listed more positively valenced collections of thoughts than did participants who viewed affective ads (M=.35, SD=1.87), F(1, 298)=11.23, p=.001. Thus, Hypothesis 1B was supported. See Tables 4-1 and 4-2 for statistical test results and means. Graphical representations of these main effects are depicted in Figure 4-1 and 4-2.

Hypothesis 2A proposed that overall, participants who were exposed to ads higher in source credibility would show more positive attitude toward the ad scores when compared to participants exposed to ads lower in source credibility. To test this hypothesis, the 2 X 2 X 2 analysis of variance with the dependent variable of attitude toward the ad was used. The results indicate a main effect of source credibility on attitude toward the ad, such that participants who viewed an ad they believed came from a credible source (M=4.08, SD= 1.30) had more positive attitude toward the ad scores than did participants who believed the ad came from a non-credible

source (*M*=3.72, *SD*= 1.29), *F*(1, 299)=5.68, *p*=.018. Therefore, Hypothesis 2A was supported. Hypothesis 2B, which stated that participants who were exposed to ads higher in source credibility would respond with more positive thoughts in the thought listing task than will participants who view ads lower in source credibility was also tested with the 2 X 2 X 2 analysis of variance. The results indicate a main effect of source credibility on thought valence, such that participants who viewed an ad they believed came from a credible source (*M*=1.08, *SD*=1.76) listed more positive thoughts than did participants who believed the ad they saw came from a non-credible source (*M*=.28, *SD*=1.90), *F*(1, 298)=14.40, *p*=.000. Therefore, Hypothesis 2B was also supported. Tables 4-1 and 4-2 report means and statistical significance, and Figures 4-3 and 4-4 provide a graphical view of these main effects.

Hypothesis 3 which proposed a main effect of cognitive load on attitude toward the ad such that participants under conditions of high cognitive load would experience less favorable attitudes toward the ad was tested with a one-way analysis of variance. Results indicated no difference in attitude toward the ad for participants who were under conditions of low and high cognitive load. Therefore, Hypothesis 3 was rejected.

Hypothesis 4 (which stated that an interaction between cognitive load and appeal type would be present such that under conditions of high cognitive load, participants would exhibit more positive attitude toward the ad to affective rather than cognitive appeals and under low cognitive load, affective and cognitive appeal types would not show significant differences in attitude toward the ad was evaluated using the 2 X 2 X 2 analysis of variance on the data. The results indicated that no interaction effect exists between ad appeal type and cognitive load on attitude toward the ad, *F*(1,297)=.015, *p*=.90. Therefore, Hypothesis 4 was rejected.

Hypothesis 5 proposed that an interaction between source credibility and advertising appeal type would be present such that source credibility would have a larger impact on attitude toward the ad for affective rather than cognitive ads. The results indicated that no interaction effect exists between source credibility level and advertising appeal type on attitude toward the ad, $F(1, 297)=.37$, $p=.54$. Therefore, Hypothesis 5 was rejected.

Hypothesis 6 stated that an interaction between cognitive load and source credibility would be present such that in conditions of high cognitive load, source credibility would have a larger impact on attitude toward the ad. The results indicated that no interaction effect exists between cognitive load and source credibility on attitude toward the ad, $F(1, 297)=.38$, $p=.54$. Therefore, Hypothesis 6 was rejected.

Exploration of Research Questions

Research Question 1, which inquired about the relationship of the three independent variables (cognitive load, source credibility, and advertising appeal type) was investigated using the same Analysis of Variance procedure that illuminated the responses to the above Hypotheses. No significant interactions between the three manipulated independent variables were discerned.

To investigate Research Question 2, which asked about the effects of additional measured independent variables on attitude toward the ad, an analysis of covariance was performed on the data using the three manipulated independent variables (advertising appeal type, cognitive load, and source credibility), and three measured independent variables (personal experience with meningitis, whether the respondent lives in a dorm, or whether the respondent has already received a vaccine for meningitis) as well as the covariates of attention paid to the ad and extent to which participants thought about the information in the ad. The Levene's test showed $p=.001$ which is appropriate for analysis which includes covariates. All six independent variables were entered into the ANOVA analysis, and covariates dealing with the level of attention paid to the

ad and the extent to which participants thought about the ad were introduced. With the introduction of these significant covariates, there was a three-way interaction between load, credibility, and vaccine, F=3.390, p=.035. For people who reported having not had a vaccine, there exists an interaction between load and credibility such that in conditions of low cognitive load, high credibility leads to a significantly higher attitude toward the ad, but in conditions of high cognitive load, attitude toward the ad is very similar for low credibility and high credibility ads. For individuals who reported having gotten a meningitis vaccine, there is an interaction between cognitive load and credibility such that participants under high and low cognitive load do not differ in attitude toward the ad when exposed to an ad high in credibility, but when exposed to an ad low in credibility, respondents under low cognitive load report a lower attitude toward the ad than respondents under high cognitive load.

For individuals who were not sure whether or not they had gotten a vaccine, a similar interaction exists; there is a very small difference between individuals under low and high levels of cognitive load when viewing an ad high in credibility, but when viewing an ad low in credibility, the individuals under high cognitive load reported a lower attitude toward the ad than people under low cognitive load. Tables 4-3 and 4-4 display the statistical tests and means for Research Question 2. Figure 4-5 displays a graphical depiction of the interactions.

Based upon the findings described above, additional analysis by way of a multivariate analysis of variance was also performed on a combination of dependent variables that could be theoretically linked: the cognitive response variables of thought quantity, thought quality, and thought valence.

The MANOVA involved the effects of the manipulated independent variables (advertising appeal type, cognitive load, and source credibility) on the cognitive response variate, which

included quantity, quality, and valence of thoughts, and was significant. Bartlett's test of sphericity showed a Chi square of 185.51, p=.000 which indicates that MANOVA results rather than separate ANOVA results should be interpreted. Levene's test showed an F-value of 1.82, p=.08, indicating that the assumptions for equivalent variance are met. The Box's M test for covariance equality was also met, M=42.85, p=.159. Two main effects and two interaction effects were found. Participants exposed to the high credibility ad (M=1.08, SD=1.76) generated significantly more positively valenced thoughts than did participants exposed to the low credibility ad (M=.28, SD=1.90). Participants who viewed the cognitive appeal generated significantly more positive thoughts (M=1.06, SD=1.81) than did participants who viewed the affective appeal (M=.35, SD=1.87). There was a significant interaction between cognitive load and source credibility on quantity and quality of thoughts, Wilks' Lambda=.973, F(3, 290)=2.73, p=.044, such that under conditions of low cognitive load, low credibility leads to more and higher quality thoughts, whereas under conditions of high cognitive load, high credibility leads to more and higher quality thoughts. There was another significant interaction between source credibility and advertising appeal type on quantity and quality of thoughts, Wilks' Lambda=.964, F(3, 290)=3.582, p=.014. Participants who view an affective ad generate more thoughts under low credibility than under high credibility, whereas participants who view a cognitive ad generate more thoughts when exposed to an ad high in credibility rather than low in credibility. In addition, when viewing a cognitive ad, participants generated higher quality thoughts when the ad was low in credibility, whereas when viewing an affective ad, participants generated thoughts relatively equal in quality under both high and low credibility. Tables 4-5 and 4-6 present statistical tests and means for this additional analysis. Figures 4-6 and 4-7 present a graphical depictions of the relationship.

To further investigate the relationship between the cognitive response variables and attitude toward the ad, multiple regression analysis was performed on the data. As shown in Table 4-7, both valence of thoughts and quantity of thoughts are significantly related to attitude toward the ad. The more positive thought valence a respondent has, the more positive their attitude toward the ad. The lower the number of thoughts listed by a participant, the more positive their attitude toward the ad.

Table 4-1. Descriptive statistics for hypotheses tests.

Cognitive load	Source credibility	Appeal type	Mean	Std. Deviation	N
Low	Low	Affective	3.41	1.29	40
		Cognitive	4.11	1.30	34
		Total	3.73	1.33	74
	High	Affective	3.92	1.04	38
		Cognitive	4.44	1.46	38
		Total	4.18	1.29	76
	Total	Affective	3.66	1.20	78
		Cognitive	4.28	1.39	72
		Total	3.96	1.32	150
High	Low	Affective	3.36	1.25	37
		Cognitive	4.10	1.16	34
		Total	3.71	1.26	71
	High	Affective	3.69	1.37	39
		Cognitive	4.26	1.20	41
		Total	3.98	1.31	80
	Total	Affective	3.53	1.32	76
		Cognitive	4.19	1.18	75
		Total	3.86	1.29	151
Total	Low	Affective	3.38	1.26	77
		Cognitive	4.11	1.22	68
		Total	3.72	1.29	145
	High	Affective	3.80	1.22	77
		Cognitive	4.35	1.32	79
		Total	4.08	1.30	156
	Total	Affective	3.59	1.26	154
		Cognitive	4.24	1.28	147
		Total	3.91	1.31	301

Table 4-2. Statistical results for hypotheses tests.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected model	41.80[a]	7	5.97	3.72	.00
Intercept	4584.77	1	4584.77	2859.12	.00
Cognitive load	1.03	1	1.03	.64	.42
Source credibility	8.31	1	8.31	5.19	.02
Appeal type	30.33	1	30.33	18.92	.00
Cognitive load × source credibility	.60	1	.60	.38	.54
Cognitive load × appeal type	.04	1	.04	.03	.87
Source credibility × appeal type	.58	1	.58	.36	.55
Cognitive load × source credibility × appeal type	.00	1	.00	.00	.98
Error	469.84	293	1.60		
Total	5106.25	301			
Corrected total	511.65	300			

a. R Squared = .08 (Adjusted R Squared = .06)

Table 4-3. Means and standard deviations for research question 2.

Cognitive load	Source credibility	Vaccine	Mean	Std. Deviation	N
Low	Low	No	3.42	1.15	16
		Yes	3.60	1.52	34
		Don't know	4.11	1.11	24
		Total	3.73	1.33	74
	High	No	4.31	.93	20
		Yes	4.31	1.41	27
		Don't know	3.97	1.38	29
		Total	4.18	1.29	76
	Total	No	3.92	1.11	36
		Yes	3.91	1.50	61
		Don't know	4.04	1.26	53
		Total	3.96	1.32	150
High	Low	No	3.43	1.20	23
		Yes	4.09	1.24	31
		Don't know	3.41	1.26	17
		Total	3.71	1.26	71
	High	No	3.44	1.58	22
		Yes	4.31	1.05	37
		Don't know	3.96	1.29	21
		Total	3.98	1.31	80
	Total	No	3.44	1.38	45
		Yes	4.21	1.14	68
		Don't know	3.72	1.29	38
		Total	3.86	1.29	151
Total	Low	No	3.43	1.17	39
		Yes	3.83	1.40	65
		Don't know	3.82	1.21	41
		Total	3.72	1.29	145
	High	No	3.86	1.37	42
		Yes	4.31	1.20	64
		Don't know	3.97	1.34	50
		Total	4.08	1.30	156
	Total	No	3.65	1.29	81
		Yes	4.07	1.32	129
		Don't know	3.90	1.28	91
		Total	3.91	1.31	301

Table 4-4. Statistical results for research question 2.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected model	211.16[a]	64	3.30	2.60	.00
Intercept	97.58	1	97.58	76.64	.00
Attention	5.16	1	5.16	4.05	.05
Extent of thinking	9.79	1	9.79	7.69	.01
Cognitive load	1.30	1	1.30	1.03	.31
Source credibility	.28	1	.28	.22	.64
Appeal type	4.62	1	4.62	3.63	.06
Vaccine history	.94	2	.47	.37	.69
Personal relevance	.00	1	.00	.00	.99
Living in dorm	.04	1	.04	.03	.87
Cognitive load × source credibility × vaccine history	8.48	2	4.24	3.33	.04

a. R Squared = .413 (Adjusted R Squared = .253)

Table 4-5. Descriptive statistics for additional analysis.
A) Thought valence. B) Thought quantity. C) Thought quality.

A

	Cognitive load	Source credibility	Appeal type	Mean	Std. Deviation	N
Thought valence	Low	Low	Affective	.03	2.27	40
			Cognitive	.59	2.05	34
			Total	.28	2.17	74
		High	Affective	.79	1.54	38
			Cognitive	1.50	1.77	38
			Total	1.14	1.69	76
		Total	Affective	.40	1.98	78
			Cognitive	1.07	1.95	72
			Total	.72	1.98	150
	High	Low	Affective	-.16	1.55	37
			Cognitive	.76	1.48	34
			Total	.28	1.58	71
		High	Affective	.74	1.85	39
			Cognitive	1.30	1.80	40
			Total	1.03	1.83	79
		Total	Affective	.30	1.76	76
			Cognitive	1.05	1.67	74
			Total	.67	1.75	150
	Total	Low	Affective	-.06	1.95	77
			Cognitive	.68	1.77	68
			Total	.28	1.90	145
		High	Affective	.77	1.69	77
			Cognitive	1.40	1.78	78
			Total	1.08	1.76	155
		Total	Affective	.35	1.87	154
			Cognitive	1.06	1.81	146
			Total	.70	1.87	300

B

	Cognitive load	Source credibility	Appeal type	Mean	Std. Deviation	N
Thought quantity	Low	Low	Affective	2.78	1.23	40
			Cognitive	2.62	1.21	34
			Total	2.70	1.21	74
		High	Affective	2.18	1.01	38
			Cognitive	2.55	.95	38
			Total	2.37	.99	76
		Total	Affective	2.49	1.16	78
			Cognitive	2.58	1.07	72
			Total	2.53	1.12	150
	High	Low	Affective	2.27	.93	37
			Cognitive	2.06	.89	34
			Total	2.17	.91	71
		High	Affective	2.46	1.05	39
			Cognitive	2.58	1.24	40
			Total	2.52	1.14	79
		Total	Affective	2.37	.99	76
			Cognitive	2.34	1.11	74
			Total	2.35	1.05	150
	Total	Low	Affective	2.53	1.12	77
			Cognitive	2.34	1.09	68
			Total	2.44	1.10	145
		High	Affective	2.32	1.03	77
			Cognitive	2.56	1.10	78
			Total	2.45	1.07	155
		Total	Affective	2.43	1.08	154
			Cognitive	2.46	1.09	146
			Total	2.44	1.09	300

C

	Cognitive load	Source credibility	Appeal type	Mean	Std. Deviation	N
Thought quality	Low	Low	Affective	4.55	1.68	40
			Cognitive	4.74	1.60	34
			Total	4.64	1.64	74
		High	Affective	4.18	1.52	38
			Cognitive	4.00	1.38	38
			Total	4.09	1.44	76
		Total	Affective	4.37	1.60	78
			Cognitive	4.35	1.52	72
			Total	4.36	1.56	150
	High	Low	Affective	3.68	1.51	37
			Cognitive	4.26	1.60	34
			Total	3.96	1.57	71
		High	Affective	4.26	1.82	39
			Cognitive	4.20	1.51	40
			Total	4.23	1.66	79
		Total	Affective	3.97	1.69	76
			Cognitive	4.23	1.54	74
			Total	4.10	1.62	150
	Total	Low	Affective	4.13	1.65	77
			Cognitive	4.50	1.61	68
			Total	4.30	1.63	145
		High	Affective	4.22	1.67	77
			Cognitive	4.10	1.44	78
			Total	4.16	1.55	155
		Total	Affective	4.18	1.65	154
			Cognitive	4.29	1.53	146
			Total	4.23	1.59	300

Table 4-6. Multivariate and univariate results for the effects of independent variables on thought quantity, quality, and valence.

	Multivariate results		Univariate F-values			
	Wilks' Lambda	F-value	df	Valence	Quantity	Quality
Cognitive load	.99	1.04	(3,290)	.09	2.36	2.15
Source credibility	.95	4.81	(3,290)	13.83	.01	.64
Appeal type	.96	3.98	(3,290)	10.82	.05	.53
Cognitive load × source credibility	.97	2.73	(3,290)	.08	7.53	4.89
Cognitive load × appeal type	.99	.70	(3,290)	.06	.39	.53
Source credibility × appeal type	.96	3.58	(3,290)	.07	2.93	1.92
Cognitive load × source credibility × appeal type	1.00	.21	(3,290)	.38	.16	.14

Table 4-7. Results of multiple regression.

	Unstandardized coefficients		Standardized coefficients		
Model	B	Std. Error	Beta	t	Sig.
(Constant)	3.96	.17		23.17	.00
Thought valence	.38	.03	.55	12.47	.00
Thought quantity	-.16	.06	-.14	-2.59	.01
Thought quality	.03	.04	.04	.75	.45
R Squared = .316 (Adjusted R Squared = .310)					

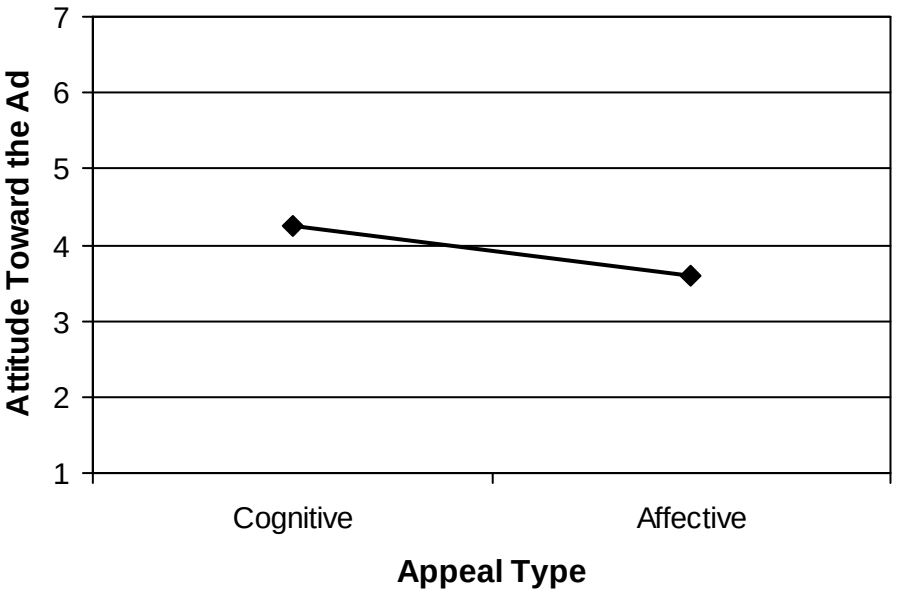


Figure 4-1. Attitude toward the ad for cognitive and affective advertising appeal types.

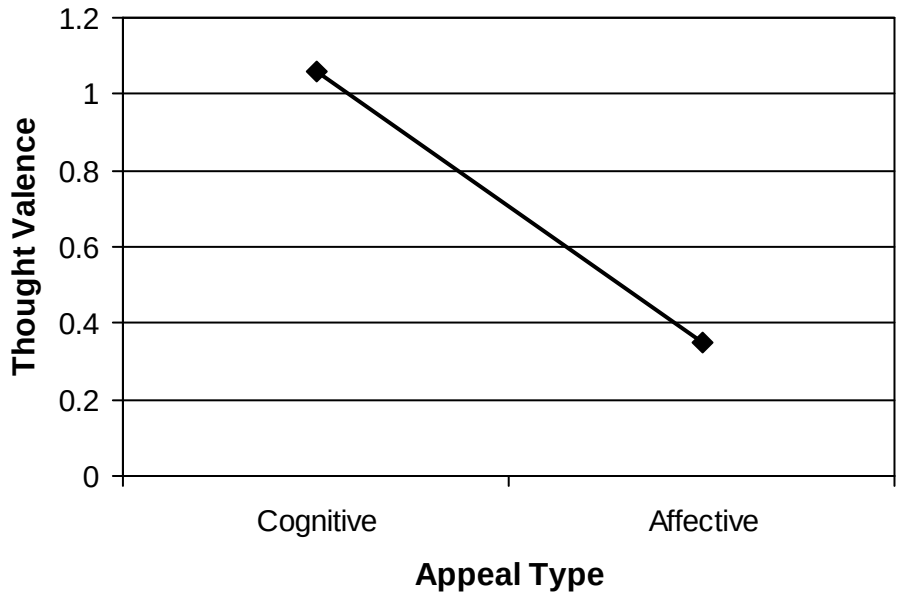


Figure 4-2. Mean thought valence for cognitive and affective advertising appeal types.

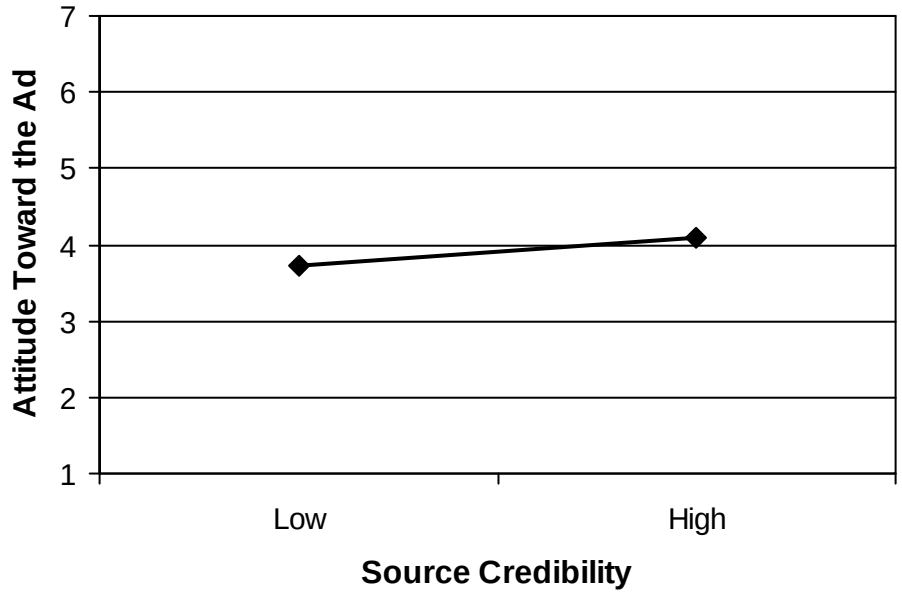


Figure 4-3. Attitude toward the ad for low and high source credibility ads.

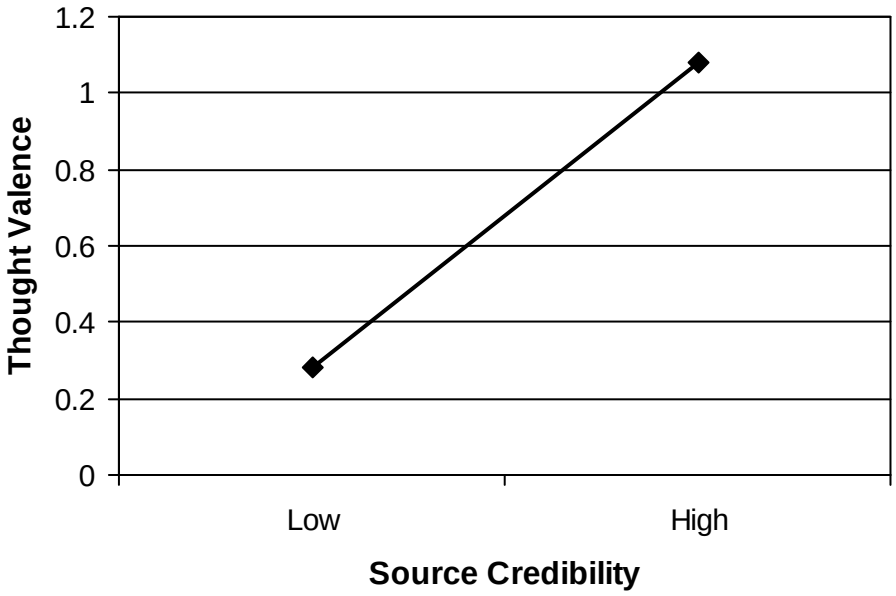


Figure 4-4. Mean thought valence for low and high source credibility ads.

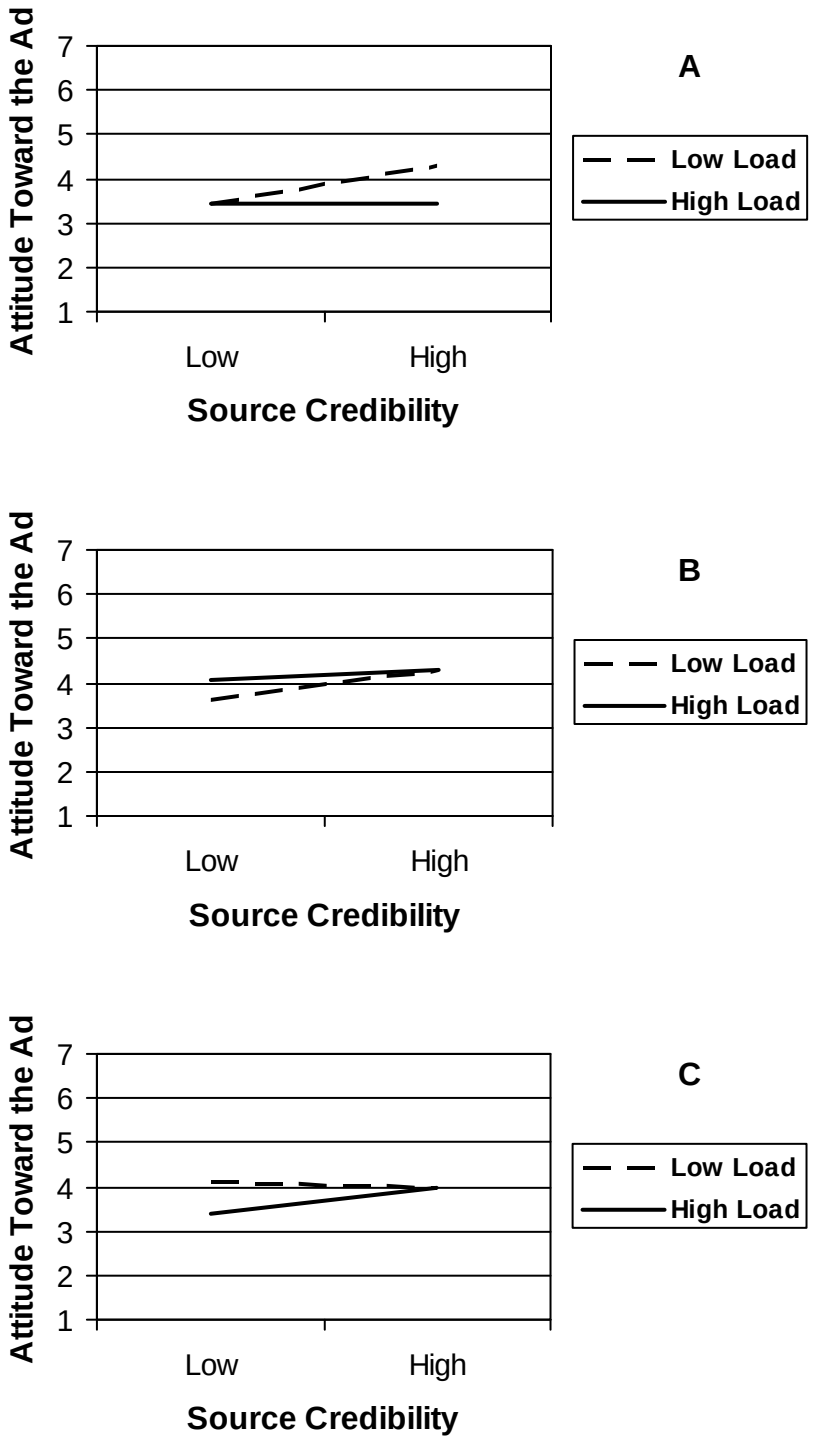


Figure 4-5. Mean attitude toward the ad for low and high source credibility under conditions of low and high cognitive load.

A) No vaccine. B) Vaccine. C) Not sure vaccine.

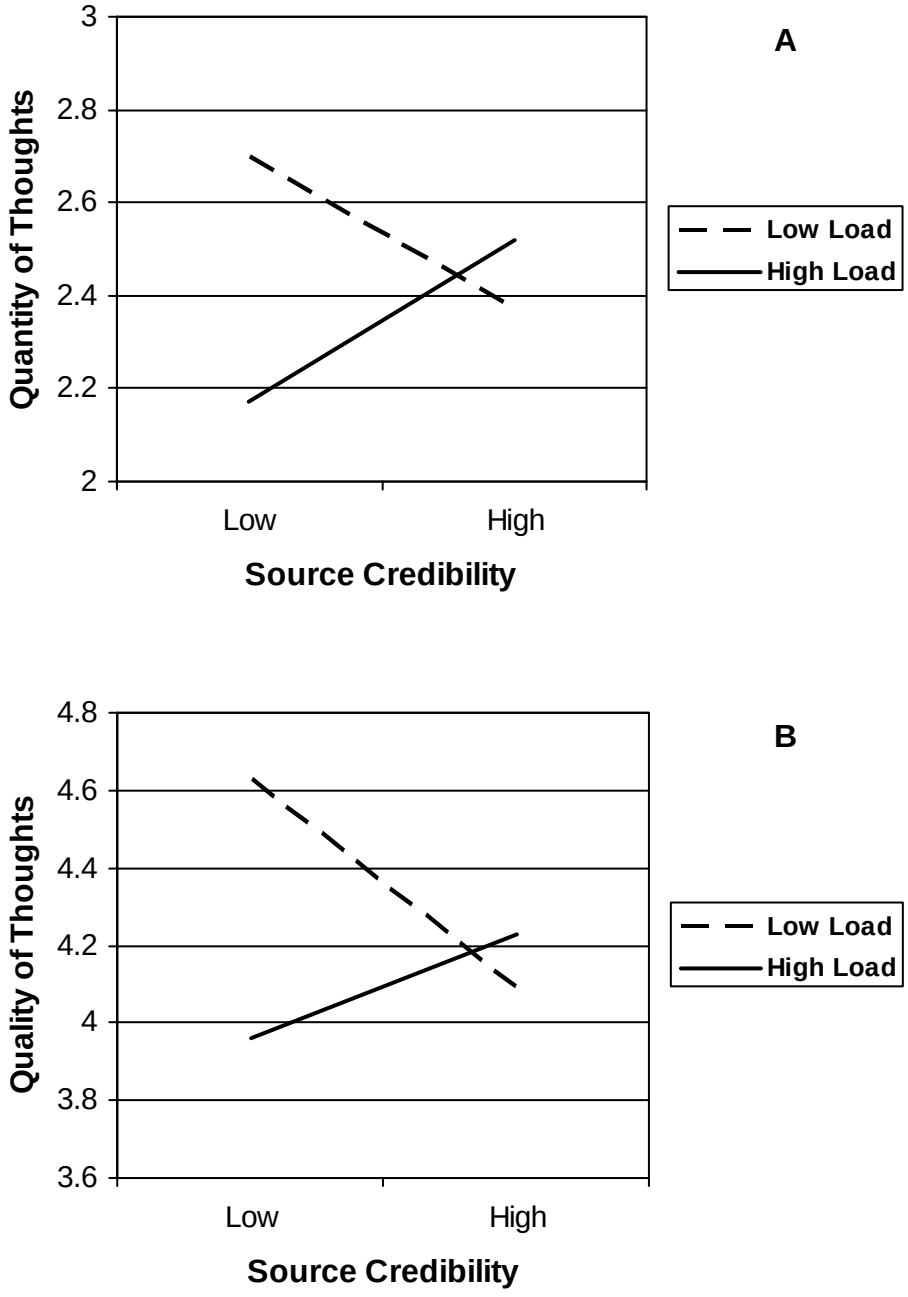


Figure 4-6. Interaction effects of cognitive load and source credibility.

A) On quantity of thoughts. B) On quality of thoughts.

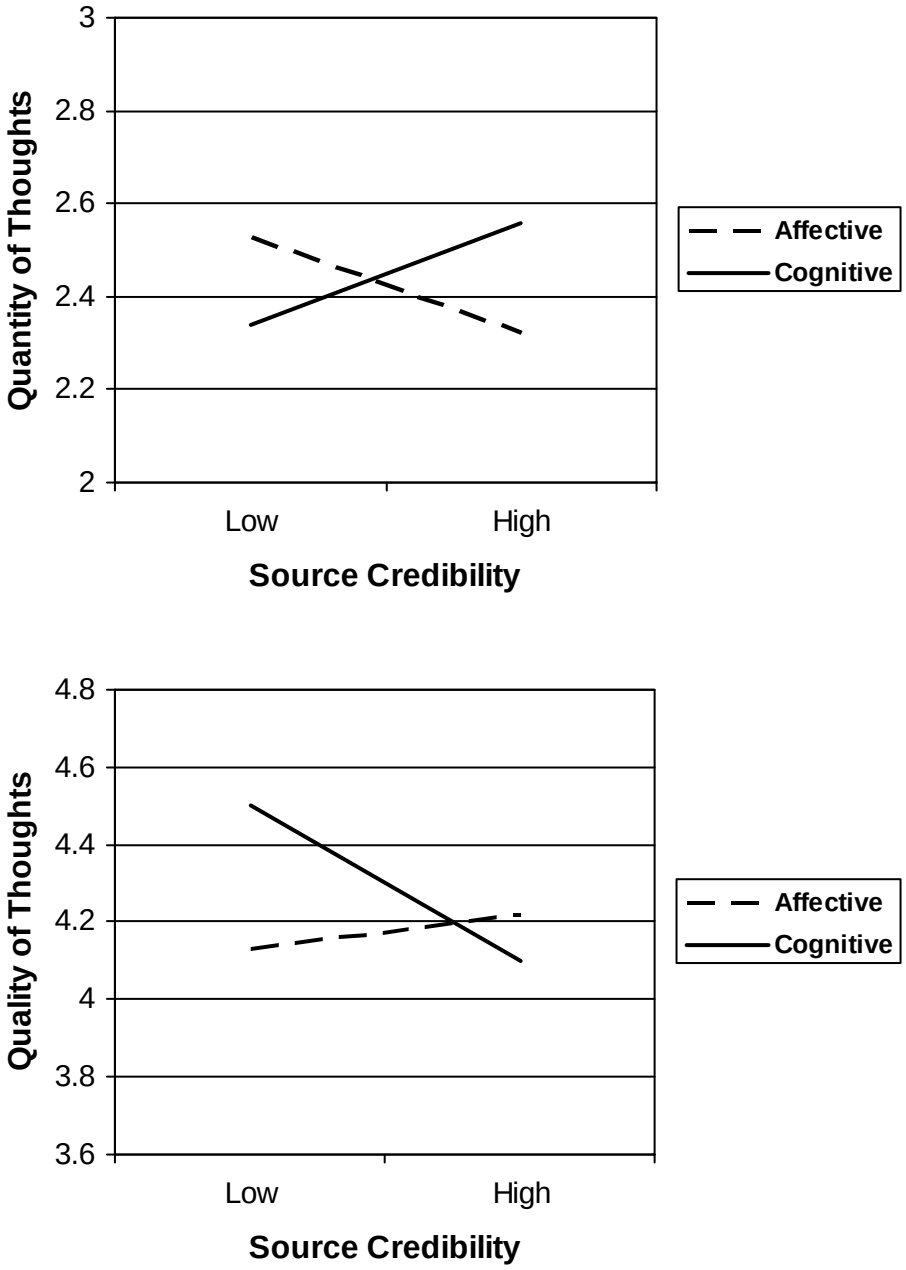


Figure 4-7. Interaction effects of appeal type and source credibility.

A) On quantity of thoughts. B) On quality of thoughts.

CHAPTER 5
DISCUSSION

Based on the increasing numbers of advertisements and unique advertisement placements in today's society as well the concern over advertising clutter, this study hoped to learn more about different combinations of advertiser controlled variables, such as source credibility and type of advertising appeal, that would be more or less effective (in terms of attitude toward the ad) for consumers who do or do not have the resources necessary to fully process an ad. The purpose of this study was to investigate the effects of three variables: source credibility, cognitive load, and advertising appeal type (cognitive or affective) that had not previously been connected in one single study but had been researched in other combinations. Attitude toward the ad was chosen as a dependent variable based on its relationship to sales (Haley & Baldinger, 1991) and its direct relevance to attitude toward the brand, particularly for brands (like the fictitious one used in the current study) that are less familiar to consumers (Burke & Edell, 1986; Machleit & Wilson, 1988).

Using the Elaboration Likelihood Model (Petty & Cacioppo, 1983) as a theoretical framework, a relationship between these three variables seemed probable. Both source credibility and affective dimensions of advertisements are considered to be peripheral cues by the ELM, and which of these two would become more influential if participants had decreased ability to process arguments centrally would be helpful to the understanding of the ELM as a theory as well as to advertising practitioners seeking to increase advertising effectiveness.

Previous research has demonstrated that the processing and result of source credibility manipulations is interconnected with motivation to process a message as well as the availability of cognitive resources to process the message (Chaiken & Maheswaran, 1994; Ratneshwar & Chaiken, 1991), which has a direct connection to the concept of cognitive load. Concurrently,

consumer decision making research exhibited differences in cognitive and affective processing and decision making under low and high cognitive load (Shiv & Fedorkhin, 1999). Source credibility has also been researched alongside appeal type with significant findings (Yoo & MacInnis, 2005). In sum, various two-way relationships between the variables have been documented. Whether these three variables exhibit meaningful relationships when merged into one study was therefore the main objective of this research.

This chapter will present an evaluation of each hypothesis in terms of the study results. Possible explanations for the results are explored alongside implications for theory and the advertising industry. Limitations of the current study and ideas for future research are also suggested.

Evaluation of the Hypotheses

The findings of Hypotheses 1A and 1B were as predicted. The FCB grid (Vaughn, 1980) places health related products in high involvement areas. Although involvement wasn't measured in the current study, the use of a high-involvement product would predict participants' desire for product-relevant information. Therefore, the cognitive advertising appeal should be preferred to the affective advertising appeal.

Ducoffe's (1995) advertising value phenomenon may also play a role in these results. Advertising value is vital to audience processing motivation and two types of value have been proposed and investigated in prior studies: entertainment value and information value. It seems that in this study, with a high involvement, health-related product advertisement, participants valued information over entertainment.

Hypotheses 2A and 2B were also supported. This finding is consistent with many source credibility findings in past research, and also demonstrates that direct-to-consumer pharmaceutical ads, even without an in-ad endorser, exhibit these patterns. The source

credibility manipulation used in the current study differs from many other studies in that a spokesperson or endorser is not explicitly present. MacKenzie and Lutz (1989) describe several other types of credibility, called advertiser credibility and advertising credibility, that they found lead to a concept called ad credibility. The credibility of a particular ad, in turn, has a significant impact on both attitude toward the ad and attitude toward the brand. According to Stern (1994), the credibility of the sponsor (or entity actually paying for the production and media space for a particular ad) is a separate dimension of source credibility than the credibility of the person who is actually communicating the information within the advertisement. In the current study, the source credibility manipulation was similar to Stern's sponsor credibility. The credibility manipulation took place outside of the ad by informing consumers that the ad produced by this sponsor had or had not been approved by a federal regulatory agency. This manipulation still seemed to have an impact on attitude toward the ad, concurring with Stern's (1994) notion of "source multidimensionality" (p. 8).

The data analyzed failed to provide evidence for Hypotheses 3 and 4. There was no main effect of cognitive load on attitude toward the ad, and no significant interaction between advertising appeal type and cognitive load. Some theorists suggest separate working memory stores for verbal and visual data (for example, Baddeley, 2000). If in fact working memory consists of separate pools of resources for verbal and visual information, the highly verbal task of memorizing a number may not have reduced the resources necessary for the processing of the images or charts in the two advertisements, which could be considered mainly a visual task. Another potential cause of the results is that perhaps the cognitive load manipulation was not strong enough to induce negative affect or otherwise affect advertisement preferences, particularly considering the tendency of today's college students to be experienced multi-taskers.

Analyzing data collected in 2002-2003, a study by Foehr (2006) reported that 81% of 7th through 12th graders reported media multitasking behaviors, which accounted for 26% of their media exposure. Bühner, König, Pick and Krumm (2006) found that the ability to successfully multitask is positively related to working memory, which can be improved with practice (Verhaeghen, Cerella & Basak, 2004). Had a within-subjects design been utilized, with participants being exposed to both cognitive and affective ads and asked to rate or choose between them, the hypothesized effect could possibly have been apparent. Most other studies using cognitive load in the area of consumer behavior measure consumer choice as a dependent variable (for example, Shiv & Fedorikhin, 1999). Although this study aimed to apply cognitive load to advertising situations, it could be that asking consumers to make a distinct choice or decision regarding a product may require more cognitive resources. Perhaps more risk is involved in choosing one product (and thereby not choosing another), or perhaps making a choice is more involving than simply reporting an attitude. Another potential explanation for these results is that viewing an advertisement, even one providing information that is important to a viewer, is not as important or as salient as being asked to make a consumer-related choice, as was the task in the Shiv and Fedorkhin (1999) study.

The interaction outlined in Hypothesis 5 was also not supported by the data. Previous research had found an interaction of this type in the product category of long distance telephone service (Yoo & MacInnis, 2005), but in the current study no such interaction was evident. Each of the variables involved in Hypothesis 5 did exhibit a main effect: high source credibility was always more effective in terms of increasing attitude toward the advertisement than was low source credibility, and cognitive advertising appeals always elicited more positive attitude toward the advertisement than did affective advertisements. In this case, advertising appeal type

and source credibility have separate effects influencing attitude toward the advertisement but do not depend on each other.

Past studies have described the manner in which source credibility information is used in different ways according to the level of elaboration in which a viewer is likely to engage. In the current study, no such interaction existed and Hypothesis 6 was not supported, although the cognitive load manipulation was successful. The source credibility manipulation was strong and salient; perhaps if the source credibility manipulation had taken place in the advertisement itself rather than in a manipulation before the advertisement was seen, this hypothesized result would have been apparent, as it may have been more difficult for individuals under high cognitive load to process the source credibility information. Another possible explanation is that in the current study, in an attempt to make each manipulation salient, the source credibility manipulation took place prior to the cognitive load manipulation. If the order of the manipulations had been reversed, perhaps the source credibility manipulation would not have demonstrated such a robust main effect.

Evaluation of the Research Questions

The data analysis did not shed any light on an answer to Research Question 1, which asked about the interactions between source credibility, cognitive load, and advertising appeal type, other than that no significant interaction was found between those three independent variables. When combined together, there appears to be no conclusions that can be made regarding the influence of these variables on attitude toward the advertisement. Although the manipulations for all three variables did work as planned, no effects were found. Since no previous studies had been performed on these three variables in combination, no hypotheses had been made about them together. Although theory did not allow for the formation of a true hypothesis, it was presumed that these variables would interact in some way due to the

Elaboration Likelihood Model (Petty & Cacioppo, 1986). With the serious nature of the product being advertised, participants should have been interested in learning more about the product, but the cognitive resource constraints applied by the cognitive load manipulation may have either forced them to rely on the source credibility cues as a basis for their evaluation of the advertisement, or may have led to them not having the resources available to process that additional information. At the same time, whether appeals aimed toward cognitive or affective persuasion were more effective may have not only been affected by cognitive load and resource availability, but also by whether the ad was introduced as a high or low credibility source.

Research Question 2, however, did provide some information. When the three manipulated independent variables previously discussed as well as three relevant lifestyle variables (living in a dorm, having personal experience with meningitis, and vaccine history) were included in the analysis along with the covariates of attention paid to the ad and extent to which the participant thought about the ad, a significant three-way interaction between cognitive load, source credibility, and vaccine history emerged. The individual difference lifestyle variables were chosen and included because it was thought that those might influence the motivation and interest in the product being advertised; for example, if a person has not had a meningitis vaccine, he or she might be more motivated to process a message advertising such a product. And, in fact, that may have been the case. Once elaboration variables were controlled for, the patterns of interaction between source credibility and cognitive load differed according to vaccine status. Specifically, in respondents answering “not sure” or “yes” to the question of whether they had received a preventative meningitis vaccine, the high credibility advertisement elicited similar attitudes toward the ad in both conditions of high and low cognitive load. The difference is exhibited in the low credibility condition; for respondents who were sure they have

had the vaccine and who were exposed to an ad low in credibility, participants under high cognitive load showed more positive attitudes toward the ad than did participants under low cognitive load. Respondents who are unsure as to whether they received the vaccine are more positively influenced by an ad low in credibility when they are under low load than when they are under high load.

For participants who were sure they had not received a vaccine and who were under conditions of high cognitive load, differences between low and high credibility conditions did not emerge. However, for participants under low cognitive load, the high credibility ads elicited more positive attitudes than did the low credibility ads. This is congruent with what might be hypothesized by taking into account the Elaboration Likelihood Model of Petty and Cacioppo (1986). Participants who are certain they have not received the vaccine are likely to be more motivated to process a message pertaining to the vaccine. Although an attempt was made to develop a fictional product that would appeal to all participants regardless of vaccine history, it appears that participants who were certain they had not gotten the vaccine were more affected by the source credibility manipulation in the low cognitive load rather than the high cognitive load condition. For these individuals, motivation to process the ad was likely to be high because of the perceived vulnerability to the disease discussed in the ad. However, simply having the motivation and desire to process the ad is insufficient when ability or opportunity are unavailable. In this case, participants' ability to process the message, including message source cues, was hampered in the high cognitive load condition. For these participants, the effect of the source credibility manipulation was absent. Only in the low cognitive load condition did participants who were told they were seeing an FDA-approved ad differ from those who thought the ad had not been approved. Many researchers consider source credibility to be a peripheral

cue in the ELM (Higgins, 1999; Kiesler & Mathog, 1968; Petty, Cacioppo, & Goldman, 1981; Petty, Cacioppo & Schumann, 1983), so why the effects of source credibility were affected by cognitive load under these circumstances is an interesting question. One possible answer is that under circumstances of high motivation and interest, source credibility becomes a central part of the message. Higgins (1999) found that under time constraints which should have induced peripheral processing, source credibility was not utilized as much, perhaps because it was more complex than other message cues may have been In addition, several studies which have used source credibility as a peripheral cue also examine the central, message content-related variable of argument quality or strength, which was not directly included in this study. It could be that the cognitive ads were thought of as strong arguments and the affective ads as weak, but these were not measured in the current study and therefore are suggested to be included in a future study to gain further clarification.

Two interesting points about the findings for Research Question 2 should be remarked upon. First, participants who are not sure if they have received the vaccine tend to respond more similarly to participants who have received the vaccine, than to participants who have not received the vaccine. This finding is intriguing since it would also be plausible for the "Not sure" participants to be more similar to the "No" participants, in that only the "Yes" participants can be confident that they have been protected from the disease. "Not sure" participants may have reassured themselves that they were not in danger (perhaps by assessing uncertainty as less risky than being certain they had not received the vaccine) in order to reduce cognitive dissonance, a state of inner tension that occurs when beliefs and behavior do not match (Festinger, 1957). Although the intention of the advertisements utilized in the study was not to

induce fear, the serious nature of the disease may have invoked at least slight fear in many participants.

Secondly, the finding for participants who had not gotten the vaccine was opposite to what had been proposed in Hypothesis 6 for all participants. It is apparent that once other important variables are controlled for, an interaction opposite to the hypothesized interaction occurs. Participants under high cognitive load show no differences between attitudes evoked by low and high source credibility messages; it seems that under high cognitive load, participants may not be able to process the source credibility information. This finding may suggest that source credibility is a central processing cue, as was outlined in MacKenzie and Lutz (1989), rather than a peripheral cue as outlined by the ELM (Petty & Cacioppo, 1986). Another intriguing finding was that the interaction between cognitive load and source credibility was not apparent if other essential variables were not accounted for. In this case, the variables included items that may have increased the motivation to process the message, as well as the actual elaboration about the message. Both of these have been found to be of great consequence in other studies, and it appears that their inclusion in the current study is essential to adequately explain the relationship between source credibility and cognitive load.

The additional analyses also illuminated intriguing findings. In some cases, dependent variables may be theoretically linked and therefore may not exhibit significant effects from an independent variable unless they are combined into a variate for analysis. Results from the additional analyses indicated that this was the case for the cognitive response variables of quality of thoughts, quantity of thoughts, and thought valence, which were all measured using the thought listing task. Two main effects, those of source credibility and advertising appeal type,

on valence of thoughts, emerged. These were hypothesized, and have been discussed in Hypotheses 1B and 2B.

An interaction between cognitive load and source credibility was present for both quantity and quality of product related thoughts. When under low cognitive load, low credibility led to a higher quantity and quality of thoughts, whereas under high cognitive load, low and high credibility led to similar levels of quantity and quality in the thought listing task. This may have been due to the ability of low cognitive load individuals to process the ads more in general, and respond more, and when faced with a low credibility ad, they were inspired to respond with more and higher quality, negatively valenced responses. Since there was also a main effect of source credibility on valence of thoughts, the thoughts listed by the individuals in the low credibility and low cognitive load condition would also have been more negatively valenced than in the high credibility and low cognitive load condition.

Different patterns were found for the interaction between appeal type and credibility. Individuals exposed to cognitive ads had a much higher quality of thoughts when they believed the ad originated from a source low in credibility, but individuals exposed to the affective ad showed more quality of thoughts when viewing an ad high in credibility. In terms of the quantity of product related thoughts listed, participants under low cognitive load listed more thoughts when they viewed a low credibility ad, whereas under high cognitive load, individuals listed more thoughts when viewing an ad they perceived as having high credibility. Perhaps it is easier to list thoughts when exposed to a high credibility ad when you do not have the cognitive resources necessary to critically evaluate the message, but when under low cognitive load, more and better quality thoughts were listed when participants had been exposed to an ad low in credibility.

An additional regression analysis found that valence of thoughts is positively related and quantity of thoughts is negatively related to attitude toward the ad. Positive valence of thoughts being positively related to attitude is somewhat self-explanatory, but the explanation for an increase in quantity of thoughts being associated with less favorable attitude toward the ad warrants thoughtful interpretation. It is impossible to infer causality from this portion of the study since cognitive response can not be directly manipulated, but perhaps participants who had less favorable attitudes toward the ad thought more about the message and listed more of those thoughts, or perhaps individuals who listed more thoughts had more of a chance to think about and discount the message.

Implications and Limitations

General

This study agrees with MacKenzie and Lutz (1989) in suggesting that attitude toward the ad is dependent on multiple factors, including individual difference variables, source cues, and contextual aspects. Many issues which have an impact on advertisement processing and response, such as prior experiences and other individual differences, are simply not under the control of the advertiser. However, as advertisers continually seek to reach audiences more effectively, research to understand the intricacies of consumer processing continues to provide guidance and direction to theory and practical application.

It was not until several key details such as personal history were accounted for that the patterns expected by Petty and Cacioppo's Elaboration Likelihood Model (1983) became apparent, and even then, this study found results opposite to what might be predicted by the ELM depending on whether source credibility is assumed to be a central or peripheral piece of information. This has both theoretical and practical implications. First, it suggests that advertisers need to be aware that such individual differences could have a significant impact on

the success of their applied strategies. Theoretically, the processing of source credibility as a central or peripheral cue may depend on the level of opportunity offered to the audience member. More specifically, in cases where a highly motivated ad viewer does not have the cognitive resources available to process all of the information in the ad, it may be that instead of using source credibility as a cue to determine attitudes toward the ad, source credibility becomes another aspect of the ad that is simply not processed. This could be due to limitations in ability to process all of the details or context of the ad. An alternative explanation could be that when participants feel that the ad is highly relevant to their needs, the source credibility of the ad becomes central to the argument presented by the ad, particularly for a product which is relatively unfamiliar to them.

Practical Implications

In experimental studies, external validity is often limited, and therefore generalizations based on the results of such studies should be made with extreme caution. With that caveat, a few recommendations to advertising professionals can be proposed. College students seem to respond more positively to health related advertisements when information is clearly provided in a straightforward manner, such as with a graph. In addition, assuring student viewers that the advertisement has been approved by a regulatory agency may lead to more positive attitudes toward the ad.

According to the results of this study, advertisers do not need to concern themselves with simplifying messages in cognitively demanding environments when advertising to college students, as increased cognitive load did not lead to any less positive attitudes toward the ad. However, when advertising to people more highly motivated to process the message due to individual circumstances, using source credibility as a way to increase positive attitude toward the ad may not be effective for participants who are under high cognitive load. Therefore, if

advertisers are attempting to reach individuals who are highly motivated and in busy environments, using source credibility as an advertising tactic will not necessarily lead to more positive attitudes toward the ad.

Although no causal determination can be made, participants who listed more thoughts about the product in the ad had less positive attitudes toward the ad. This may be an indication that advertisers should not encourage individuals to think excessively about the product. This is similar to a notion proposed by the Resource Matching Hypothesis, that when participants have more than sufficient cognitive resources to process a message, increased counterarguments may result (Keller & Block, 1997; Kisielius & Sternthal, 1984).

Limitations

Several limitations of this study should be noted. One weakness was the student sample utilized. Although participants were randomly assigned to conditions, all participants were university students, and many were advertising majors. This limits the generalizability of the results and implications of this research.

Another limitation that should be addressed is the use of a fictitious brand and advertisement in the study. Although participants seemed to believe that the ad and the product were genuine based on the comments provided during the thought listing task, both the advertisement and the context of exposure to the advertisement were artificial; participants saw the print advertisement in a packet of study materials rather than viewing it embedded in a magazine, website, or newspaper. The use of a print rather than television advertisement, although necessary due to the number of manipulations involved and the technology and expertise readily available, may have limited the realism of the study and the cognitive/affective manipulations as well, as sound and animation were not available in a print advertisement.

In hindsight, the design of the ad may have also been problematic. Using both copy and images in the ads may have made both ads more cognitively oriented. Alternatively, the clearly organized layout of the cognitive ad may have led participants to report more positive attitudes toward the cognitive ad than to the affective ad, which included images that may not have been as straightforward. In this same sense, perhaps the cognitive ad actually required fewer cognitive resources to process than did the affective ad.

Many of the hypotheses proposed in this study were not supported by the data. This may have been due to a few of the assumptions that took place. First, a product was chosen based on Vaughn's (1980) FCB grid but involvement was not measured. It is possible that the meningitis vaccine was not highly involving for the student sample, and it was also possible that they felt that their health was not at risk. One way of obtaining useful results in the future may be to use other advertising effectiveness measures, such as choice or purchase intention. Previous studies investigating cognitive load have measured choice rather than attitude toward the ad as a dependent variable (Shiv & Fedorikhin, 1999) with significant and interpretable results; perhaps the act of making a choice is more affected by cognitive load than is making a self-report of attitudes.

Finally, due to time constraints and attempts to limit participant fatigue, it was impossible for the questionnaire to include all items that may have an impact on attitude toward the ad and advertising processing. A few of these will be discussed in the next section.

Future Research

As this study showed that many variables other than the three manipulated variables must be accounted for in drawing any conclusions, it became apparent that other measured variables, particularly involvement, would be helpful inclusions in future research. In addition, other manipulations such as argument strength could be included in future studies, to provide a more

centrally processed element alongside, or instead of, a source credibility manipulation. The individual difference or lifestyle variables that have impacts on advertising effectiveness likely change according to the type of product in the ad, so thoughtful evaluation of potential individual variables to be included for each research study should be undertaken.

The order and method of manipulations could also be altered; in the current study, source credibility was the first variable to be manipulated and the manipulation occurred prior to participants' viewing of the ad. Future studies should try other methods of source credibility manipulation such as the use of an endorser in the ad, as well as manipulating source credibility after the cognitive load manipulation. Another manipulation that would be useful to experiment with would be the cognitive load manipulation. More sophisticated measures of cognitive load are available to some researchers with computer programs. Advertising research should take advantage of the more realistic cognitive load manipulations used in psychological studies when possible.

Within-subjects designs, where participants see both the cognitive and affective version of the ad, would offer increased understanding of personal preferences for appeal type or individual processing styles, as studied by Ruiz & Sicilia (2004), under varying circumstances. It would also be interesting to use one advertisement with both affective and cognitive properties in order to measure participants' perceptions of the appeal type (affective or cognitive) and attitude toward the ad, rather than actually manipulating the appeal type.

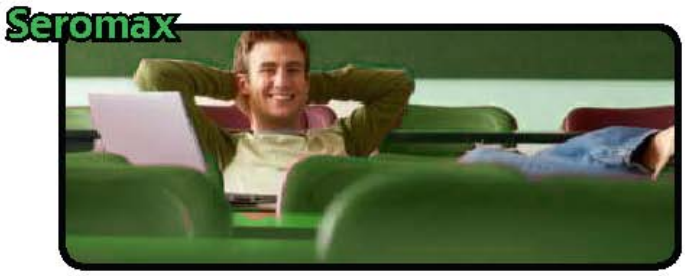
As mentioned earlier, the use of additional dependent variables such as choice and purchase intention offer further opportunities for research in this area. Although the results of the manipulated variables on attitude toward the ad were mostly limited to main effects of source

credibility and advertising appeal type, more enlightening interactions may be present when consumer choices or intentions rather than attitudes are measured.

As always, studies using varying and different samples, product category types, and media vehicles would broaden understanding and generalizability of the results.

APPENDIX A
AFFECTIVE AD STIMULUS

Meningococcal meningitis:
A full-protection vaccine is now available!



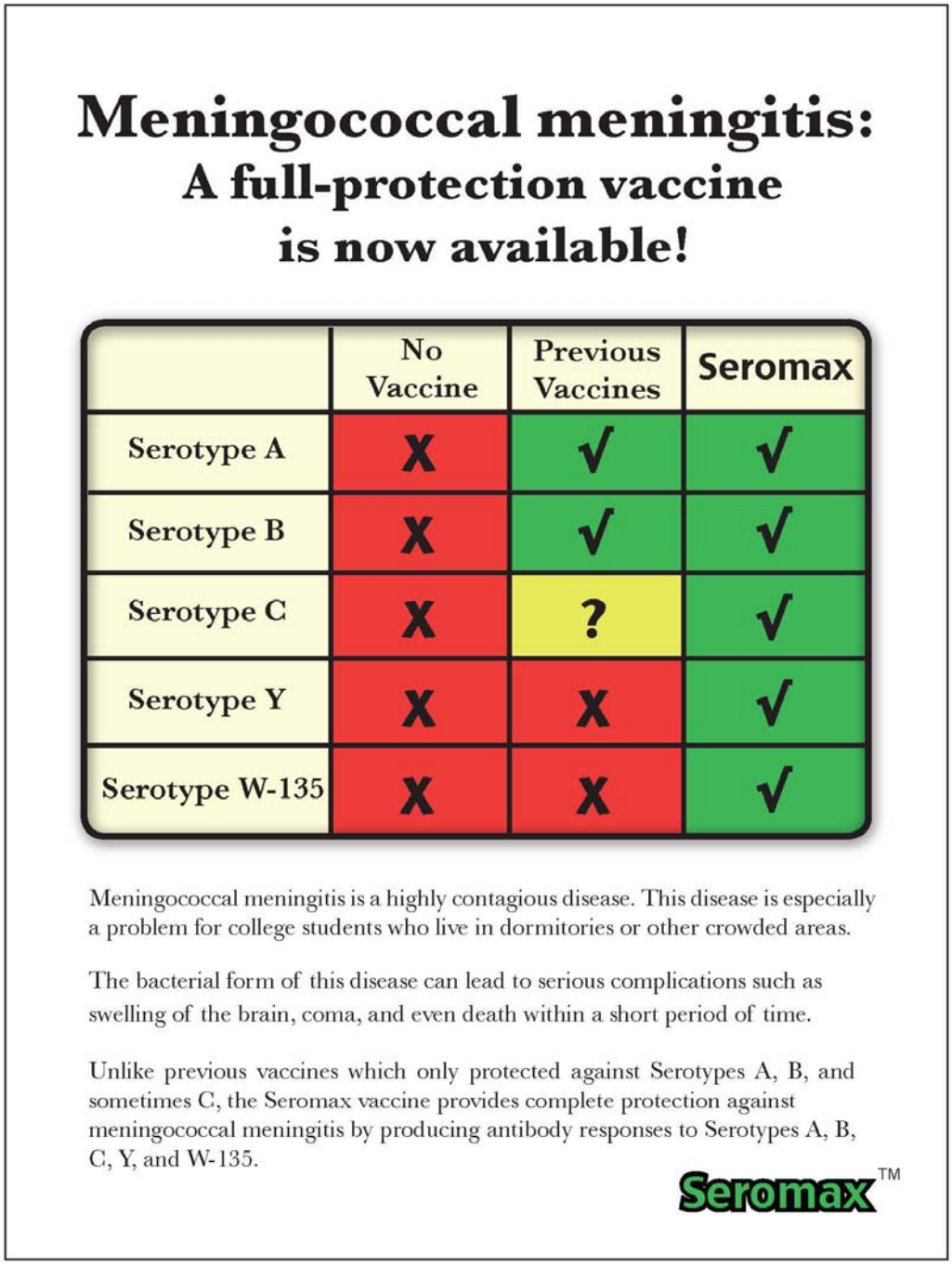
Meningococcal meningitis is a highly contagious disease. This disease is especially a problem for college students who live in dormitories or other crowded areas.

The bacterial form of this disease can lead to serious complications which could lead you to miss out on classes, time with friends, and other activities.

Relax...with the new Seromax vaccine you can rest easy knowing that you are fully protected from meningococcal meningitis. One easy dose and you're back to your favorite activities! Don't put your health and happiness at risk!

Seromax™

APPENDIX B
COGNITIVE AD STIMULUS



APPENDIX C
MAIN STUDY QUESTIONNAIRE

In research studies, it is important to make situations as realistic as possible. In your natural environment, you are often exposed to ads and other persuasive communications in busy or distracting contexts. Therefore, we would like you to mentally rehearse the following number while viewing the ads and listing your thoughts about the ads. This technique has been shown in prior research to effectively mimic real-world conditions. Please do not look back at the number once you have turned this page.

You will be asked to recall this number at the conclusion of the study.

Mentally rehearse this number for approximately 1½ minutes (please do **NOT** write the number down as you are rehearsing it). The experimenter will let you know when 1½ minutes have passed. Please do not turn away from this page until told to do so.

47935208

STOP HERE UNTIL THE RESEARCHER GIVES THE SIGNAL TO CONTINUE.

REMEMBER TO KEEP REHEARSING THE NUMBER!

REMEMBER TO KEEP REHEARSING THE NUMBER!

PLEASE DO NOT TURN BACK IN THE PACKET.

YOU MAY NOW TURN THE PAGE AND REVIEW THE AD FOR AS LONG AS YOU LIKE.

ONCE YOU ARE FINISHED REVIEWING THE AD, CONTINUE ON TO THE NEXT PAGE.

1) **Please list the thoughts you have toward the *product* depicted in the ad you just saw:**

CONTINUE TO THE NEXT PAGE

2) **Please write the number that you were rehearsing (please do not look back at the number): _____**

(Questions 3-15): Please answer the following questions about the ad you just saw. Please circle the number that corresponds to your response:

3) **The ad was**

1 2 3 4 5 6 7
Unpleasant Pleasant

4) **The ad was**

1 2 3 4 5 6 7
Unlikable Likable

5) **The ad was**

1 2 3 4 5 6 7
Not irritating Irritating

6) **The ad was**

1 2 3 4 5 6 7
Not interesting Interesting

7) **To what degree did you pay attention to the information in the advertisement?**

Not at all 1 2 3 4 5 6 7 8 9 Very much

8) **To what extent did you think about the product and the information in the advertisement?**

Not at all 1 2 3 4 5 6 7 8 9 Very much

9) **To what extent did rehearsing the number take your attention away from reading the information in the ad?**

Not at all 1 2 3 4 5 6 7 8 9 Very much

10) **Did the ad make you think of real differences between the brand and its competitors?**

Not at all 1 2 3 4 5 6 7 Very much

11) **Did the ad make you think of the reasons for the brand's superiority?**

Not at all 1 2 3 4 5 6 7 Very much

CONTINUE TO THE NEXT PAGE

12) **Did the ad make you think of the pros or cons of the brand?**

Not at all 1 2 3 4 5 6 7 Very much

13) **Did the ad make you "think" rather than "feel"?**

Not at all 1 2 3 4 5 6 7 Very much

14) **Did the ad make you think of arguments for using or not using the brand?**

Not at all 1 2 3 4 5 6 7 Very much

15) **Did the ad make you think of facts about the brand?**

Not at all 1 2 3 4 5 6 7 Very much

Please rate the ad you saw in terms of these words:

16)
1 2 3 4 5 6 7
Expert Not Expert

17)
1 2 3 4 5 6 7
Experienced Not Experienced

18)
1 2 3 4 5 6 7
Trained Untrained

19)
1 2 3 4 5 6 7
Trustworthy Untrustworthy

20)
1 2 3 4 5 6 7
Moral Immoral

21)
1 2 3 4 5 6 7
Good Bad

CONTINUE TO THE NEXT PAGE

22) Have you received a preventative Meningitis vaccine? (circle one):

Yes No Not Sure

23) Have you or anyone in your family experienced Meningitis? Yes No

24) Do you live in a dormitory or student housing at UF? Yes No

25) What is your age? _____

26) What is your major? _____

27) What is your gender? (circle one) Male Female

28) What is your ethnic background? (circle one)

a) Caucasian b) African American c) Hispanic d) Asian

e) American Indian/Alaskan Native f) Hawaiian Native/Pacific Islander

g) Other (please specify) _____

THIS CONCLUDES THE STUDY. THANK YOU FOR YOUR PARTICIPATION!

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BIOGRAPHICAL SKETCH

Jennifer L. Lemanski was born in Madison, Wisconsin. She attended Colgate University in Hamilton, New York and graduated with a B.A. in Psychology. Jennifer enjoyed spending summers in College Station, Texas with her family, and relocated there after graduation to take classes at Texas A&M University and to work as a disc jockey at KZTR-FM.

In December 2002, Jennifer received her Master of Arts in Mass Communication from the University of Florida and returned in August of 2004 to pursue a Ph.D. in mass communication. Upon completion of her Ph.D. program, Jennifer will relocate to Edinburg, Texas to begin an appointment as Assistant Professor of Communication at The University of Texas-Pan American. Jennifer has been happily married to Andrew Monaco, an attorney, for four years.

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