INFORMATION TO USERS

The most advanced technology has been used to photograph and reproduce this manuscript from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps. Each original is also photographed in one exposure and is included in reduced form at the back of the book.

Photographs included in the original manuscript have been reproduced xerographically in this copy. Higher quality 6" x 9" black and white photographic prints are available for any photographs or illustrations appearing in this copy for an additional charge. Contact UMI directly to order.
Product knowledge: Causal inferences about its effect on advertisement processing and persuasion

Bhatla, Sunil, Ph.D.

The Ohio State University, 1990
PRODUCT KNOWLEDGE: CAUSAL INFERENCES ABOUT ITS EFFECT ON ADVERTISEMENT PROCESSING AND PERSUASION

DISSERTATION

Presented in Partial Fulfillment of the Requirements for the Degree Doctor of Philosophy in the Graduate School of the Ohio State University

By

Sunil Bhatla, B.Com., M.B.A.

* * * * *

The Ohio State University
1990

Dissertation Committee:
Paul W. Miniard, Chair
Robert E. Burnkrant
Peter R. Dickson

Approved by
Paul W. Miniard
Advisor
Business Administration
To My Parents
ACKNOWLEDGEMENTS

I am grateful to Professors Robert E. Burnkrant and Peter R. Dickson for their enduring guidance. Their professionalism will always be a source of strength and inspiration.

Financial assistance for this study was provided by an Ohio State University GSARA grant. For their assistance with various aspects of the data collection and coding, I would like to thank Susan Cappadora, Jayne Charman, Dan Innis, and Erica Moore.

I will never forget my fellow Ph.D. students who helped me retain my sanity through critical periods. You know who you are! And to Michele Flinn, who kept me going when I couldn’t see the light at the end of the tunnel, my heartfelt thanks.

Finally, I am indebted to Professor Paul W. Miniard — my mentor, teacher, and constant guide — without you, I would never have made it. Thank you, Paul!
VITA

June 27, 1962 .................................................. Born – Madras, India
1983 ................................................................. B.Com., University of Madras, India
1985 ................................................................. M.B.A., West Virginia University, Morgantown, West Virginia
1985-1989 ........................................................ Teaching and Research Associate, Department of Marketing, The Ohio State University, Columbus.
1989-Present .................................................. Instructor of Marketing, Case Western Reserve University, Cleveland, Ohio.

PUBLICATIONS


FIELDS OF STUDY

Major Field: Business Administration
Minor Field: Marketing
TABLE OF CONTENTS

DEDICATION .............................................................................................................................. ii
ACKNOWLEDGEMENTS ........................................................................................................ iii
VITA ........................................................................................................................................ iv
LIST OF TABLES .................................................................................................................. vii
LIST OF FIGURES ................................................................................................................. viii

CHAPTER

I. INTRODUCTION .................................................................................................................. 1
   Focus of this study .............................................................................................................. 2

II. LITERATURE REVIEW AND HYPOTHESES ................................................................ 5
   Conceptualizing Product Knowledge .............................................................................. 5
   The Elaboration Likelihood Model .................................................................................. 9
   Consumer Knowledge and Advertisement Elaboration .................................................. 11
   Effect on Amount of Brand-Related Thinking ............................................................... 11
   Does Knowledge Moderate the Role of Brand and Ad Thoughts as Mediators? .......... 21
   Effect of Knowledge on Valence and Origin of Brand-Related Thought .................... 22
   Knowledge and Involvement........................................................................................... 28
   Prior Knowledge x Processing Involvement Interactions .............................................. 28
   The Role of Product Involvement .................................................................................... 30

III. METHODOLOGY ............................................................................................................. 33
   Overview .......................................................................................................................... 33
   Subjects and Design ........................................................................................................ 33
   Procedure ........................................................................................................................ 34
   Independent Variables ..................................................................................................... 35
   Dependent Measures ....................................................................................................... 45
   Coding of Recall Data ...................................................................................................... 47
   Cognitive Response Coding ............................................................................................ 48
IV. RESULTS ........................................................................................................ 52
   Manipulation Checks .................................................................................... 52
   Tests of Hypotheses ..................................................................................... 57
      Effect of Knowledge on Amount of Thought – SAs and CAs .................. 57
      Effects on Single-Fact Interpretations and Abstractions ....................... 59
      Brand and Ad Thoughts Predicting Brand Attitude ............................... 62
      Effects on Valence of Thought ................................................................ 65
      Effects on Brand Attitude ....................................................................... 66
      Origin of Thought – Effects on Amount of Thought .............................. 68
      Origin of Thought – Explaining Brand Attitude ..................................... 71
      Origin of Thought and Confidence in Brand Evaluation ....................... 73
      Knowledge, Product Involvement, and Processing Motivation ................ 76
V. DISCUSSION ................................................................................................. 80
   Knowledge and Advertisement Processing .................................................. 80
      Effects on Amount and Type of Thought ................................................ 80
      Ad and Brand Thoughts Mediating Brand Attitude ................................ 83
      Susceptibility to Persuasion as a Function of Knowledge ...................... 84
      Origin of Thought, Consumer Confidence, & Brand Evaluation ........... 86
      Ad Claim Discrepancy and Claim Quality Manipulations ...................... 87
      Product Knowledge and Involvement ....................................................... 87
      Knowledge x Involvement Interactions .................................................... 87
      Effects on Processing Involvement ......................................................... 89
   Assessing the Knowledge Manipulation ....................................................... 90
   Contributions of this Study .......................................................................... 93
   Limitations .................................................................................................... 94
   Future Research Issues ................................................................................ 95
   Conclusion ................................................................................................... 97

LIST OF REFERENCES .......................................................................................... 99

APPENDICES
   A. KNOWLEDGE MANIPULATION HANDOUTS ........................................ 105
   B. OBJECTIVE KNOWLEDGE EXAM ...................................................... 131
   C. QUESTIONNAIRE USED IN MAIN STUDY ....................................... 135
   D. CODING SCHEME FOR ADVERTISEMENT RECALL ....................... 147
   E. COGNITIVE RESPONSE CODING SCHEME .................................... 152
LIST OF TABLES

1. Cognitive Response Coding – Reliability Estimates .............................................. 159
2. Cell Means for Manipulation Checks..................................................................... 160
3. Manipulation Checks: F-values .............................................................................. 161
4. Cell Means for Abstraction and Valence of Thought Measures ........................... 162
5. Abstraction and Valence of Thought: F-values ...................................................... 163
6. Cell Means for Origin of Thought and Structured Scale Measures ...................... 164
7. Origin of Thought and Structured Scales: F-values ............................................... 165
8. Brand and Ad Thoughts Explaining Brand Attitude .............................................. 166
9. Simple Correlations of Brand and Ad Thoughts with Brand Attitude ............... 167
10. Regression Analyses for Origin of Thought .......................................................... 168
11. Simple Correlations of Origin of Thought Indices with Brand Attitude .......... 169
12. Confidence as a Mediator of Origin of Thought Effects ........................................ 170
13. Product Knowledge, Product Involvement, and Processing Involvement:   
   Lisrel Results .................................................................................................... 171
LIST OF FIGURES

2. Claims and Substantiation Copy ............................................................................ 173
3. Plots of Interaction Effects ..................................................................................... 174
4. Lisrel Models ........................................................................................................... 176
5. Summary of Findings .............................................................................................. 177
CHAPTER I
INTRODUCTION

The last two decades have witnessed substantial progress in our understanding of the persuasion process. Since the initial emphasis on learning as a mediator of attitude change, researchers have developed more descriptive models of persuasion that embody a rich variety of constructs and processes. Even more recently, consumer researchers have begun to study topics such as mood and emotion (e.g., Batra and Ray 1986a; Gardner 1985b), attitude-toward-the-ad (e.g., Mitchell and Olson 1981), and memory (e.g., Keller 1987), with the goal of developing greater insight about the factors affecting persuasion.

The myriad factors that have been identified to influence persuasion have commonly been delineated into one of three classes—as message, situation, or individual variables. The strength and number of claims made in an advertisement are examples of message variables influencing persuasion. Distraction (e.g., through the presence of irrelevant cues in the processing environment) can affect persuasion by altering the situation in which processing occurs. And product-involvement, which can increase one's motivation to process an ad for that product, qualifies in the third category.
Focus of this study

A potentially important individual factor that can moderate persuasion is product knowledge. For any given product in the marketplace, consumers differ widely in the amount and type of information they have stored in memory. These differences arise for reasons ranging from individuals' disparate needs for that information to being incidentally exposed to such information through the mass media. The information that consumers possess about a product has significant implications for their behavior directed at that product, whether it be making a brand choice decision or watching an advertisement for the product. Conversely, consumer's need for the product also influences their future activity with regard to acquiring more information about the product. Understanding this interdependence between product knowledge and consumer information processing is important if we are to develop a more complete understanding of consumer behavior.

The current investigation is an attempt to probe one aspect of this interdependence between knowledge and information processing, namely the effect of product knowledge on consumer susceptibility to persuasion. Of fundamental interest is how consumers with different levels of prior product knowledge respond to advertising. Differences in these consumers' thought processes, and their susceptibility to the persuasive intent of the advertisement will be examined. In addition, since knowledge, as an individual variable, can also moderate the impact of message and situation
variables on persuasion, this study will also examine the interactive effect of knowledge, claim strength, and processing involvement on persuasion.

In the consumer research literature, despite the increasing recognition of knowledge as a moderator of several consumer-related phenomena, little evidence is available with respect to the influence of product knowledge on the processing of persuasive communications. For example, how does such knowledge alter the influence of persuasive claims and peripheral cues in a persuasion setting? The importance of understanding the effect of knowledge is underscored by the fact that the influence of other factors (such as claim strength and processing involvement) on persuasion should depend on the level of consumers' knowledge about the product.

To the extent that evidence about the role of knowledge in the persuasion process is available, it is ambivalent about the causal link between knowledge and persuasion processes/outcomes. That is, the correlational nature of available data leaves open the possibility that observed effects are not due to knowledge but perhaps other persuasion factors. Causal inference typically requires experimentally manipulating the knowledge construct, a task whose inherent difficulties have been noted by more than one author (e.g., Celsi and Olson 1988; Sujan 1985). Since consumers typically acquire product knowledge over extended periods of time, researchers faced with the limited availability of subjects find it difficult to replicate this longitudinal phenomenon in an experimental setting. Therefore, another goal of this
research is to develop and validate a procedure for manipulating product knowledge that would permit causal inference.

In Chapter II, the conceptualization of the product knowledge construct is first addressed. Then, research findings related to the influence of product knowledge on advertisement processing are reviewed. We also consider how knowledge moderates the effect of two other persuasion variables—claim strength and processing involvement—that have been widely studied, and advance hypotheses about the influence of knowledge on cognitive response and brand attitude formation.

Chapter III describes the design and execution of the study conducted to test these hypotheses. This is followed by a presentation of the results in Chapter IV. Finally, a discussion of the findings and conclusion can be found in Chapter V.
CHAPTER II
LITERATURE REVIEW AND HYPOTHESES

Conceptualizing Product Knowledge

At a generic level, the term product knowledge may be used to refer to virtually any information pertaining to the product, whether factual or not. Beliefs about the product, even when incorrect, are included in the construct as they help determine one’s subjective perception of reality, and drive consumer behavior with respect to the product. The information itself can be derived from multiple sources, ranging from past experience with the product versus recommendations gleaned from Consumer Reports, and can be related to any number of dimensions of the product.

With such an all-encompassing definition of product knowledge, any attempt to comprehensively delineate the domain of knowledge with respect to any product category is fraught with difficulty. One would need to consider knowledge dimensions ranging from technical jargon to attribute importance rankings to memories of usage experiences. Because of this, operationalization and measurement issues with respect to the construct rapidly become insurmountable, and it is not surprising to find that past research has typically dealt with such problems by selectively defining the construct to include only the specific types of knowledge most pertinent to the individual
study. As such, the product knowledge construct has been variously referred
to as past experience, product familiarity, and expertise, among others.

One of the more common conceptions of the knowledge construct defines
it as past experience with the product (see, for example, Bettman and Park
1980; Park and Lessig 1981). When defined as such, it may be
operationalized as prior ownership, usage, and/or search for information
about the product. The principal problem with such an approach is that prior
search/usage/ownership does not necessarily imply that product information
has been acquired and retained. Conversely, knowledge acquisition can often
be independent of one's actual experience with the product (Selnes and
Gronhaug 1986). While a consumer may be a walking encyclopedia when it
comes to the inner workings of rotary engines and their application to
automobiles, s/he may never have owned or driven such a car.

Another frequently used approach defines knowledge as product
familiarity, which in turn is operationalized through measures of self-ratings
of knowledge (e.g., Rethans, Swasy and Marks 1986; Srull 1983) and
frequency of purchase (e.g., Anderson, Engledow and Becker 1979; Edell and
Mitchell 1978), among others. There are two concerns with this approach.
First, as before, using self-ratings or frequency-of-purchase measures begets
the problem of weak correlations between these measures and actual
knowledge. Second, Alba and Hutchinson (1987) and Jacoby, Troutman,
Kuss and Mazursky (1986) have pointed out that product familiarity is but
one of two components of knowledge—the other is expertise. Expertise
represents a level of knowledge superior to mere familiarity in that it provides the consumer with the ability to use such knowledge to perform product-related tasks (e.g., processing an advertisement, choosing between brands, etc.). Although familiarity generally enhances expertise, it cannot be assumed that familiarity per se is a sufficiently comprehensive indicator of knowledge.

One conclusion that may be drawn is that, in studying the effect of knowledge, it is useful to look at (a) whether consumers possess product facts, such as knowledge about product attributes, and (b) their ability to use the information for product-related tasks. The first category would be subsumed under the product familiarity construct, while the second category is representative of expertise, such as knowledge about which attributes are most important in choosing between brands.

What is needed, then, is a comprehensive delineation, or typology, of the different types of knowledge one might have about a product. Although the effect of knowledge on consumer behavior has received increased attention recently (e.g., Alba and Hutchinson 1987; Srull 1983; Sujan 1985), few attempts have been made at specifying the domain of product knowledge. Probably the only extensive attempt to delineate the composition of product knowledge can be found in Brucks’ (1986) study. Brucks’ approach to characterizing product knowledge specifies eight content areas: Terminology, Product Attributes, General and Specific Attribute Evaluations, General and Personal Product Usage, Brand Facts, and Purchasing and Decision Making
Procedures (see Figure 1 for a description of these categories). This specification of the product knowledge domain spans the constructs of familiarity and expertise. Terminology, Product Attributes, and Brand Facts refer to content knowledge that increases with product familiarity. Attribute Evaluations, Product Usage, and Decision Making Procedures are categories that pertain to the use of content knowledge in product-related tasks. As one criterion for validating this typology, Brucks found that 98 percent of the statements her subjects recalled about a product could be unambiguously classified within one of the eight categories.

Adopting such a comprehensive definition of product knowledge characterized by these eight categories is thus advantageous for studying the effect of knowledge on advertisement processing. In addition, this typology also lends itself to developing an approach for manipulating the knowledge construct in an experimental setting (to be discussed later).

Several models (e.g., Chaiken 1987; Palmerino, Langer and McGillis 1984) have recently been proposed to provide an organizing framework within which to consider the effect of message, situation, and individual factors on persuasion. Among the most widely accepted is the Elaboration Likelihood Model (Petty and Cacioppo 1986; ELM). To better understand the role of product knowledge, it is useful to consider its effects within the context of the ELM, as this allows us to better understand how knowledge interacts with message and situation factors in determining persuasion.
The Elaboration Likelihood Model

The ELM holds that factors affect persuasion by (a) serving as persuasive arguments, (b) serving as peripheral cues, and/or (c) affecting the extent or direction of elaboration, and therefore moderating the influence of arguments and peripheral cues. In an advertising context, arguments are claims made in the persuasive message that are relevant to evaluating the true merits of the product. Peripheral cues are stimuli that, although irrelevant to the merits of the product, can effect persuasion when the viewer relies on these to form product evaluations. Elaboration is defined as thinking about product-relevant information, such as claims made about the product, or other product information made available by the activation of one's prior product knowledge.

According to the ELM, persuasion occurs along a continuum defined by the extent of elaboration during message processing. At one end of this continuum, characterized by high elaboration, persuasion follows what is termed as the central route. In this mode, persuasion is based on the careful consideration of issue-relevant information presented in the communication and the degree of persuasion will depend on the quality or strength of this information. The other end of the elaboration continuum represents an absence of such thoughtful elaboration. In this mode, referred to as the peripheral route, attitude change is based on peripheral cues (e.g., an attractive picture that does not convey information considered by the person to be relevant in evaluating the product's true merits), and is presumed to be
relatively transitory. Toward the middle of the elaboration continuum, the ELM suggests a co-existence of both routes to persuasion.

One of the many studies that provide evidence for predictions based on the ELM is by Petty and Cacioppo (1984). In an experiment that exposed subjects to a message advocating a senior comprehensive exam requirement, they manipulated claim quality, the number of claims (three versus nine), and the personal relevance of the message to recipients. Their findings revealed that, as personal relevance increased, the impact of the claims quality manipulation also increased, while the influence of the number of claims manipulation decreased. Thus, subjects who perceived the message as personally relevant engaged in a higher level of elaboration involving a more careful evaluation of the claims. These subjects were consequently affected by the quality of these claims. On the other hand, when the message was not personally relevant, greater persuasion resulted when the number of claims was nine rather than three, regardless of the claims being cogent or specious.

As noted earlier, message, situation, and individual variables can impact persuasion by serving as arguments, peripheral cues, and/or by influencing argument elaboration. Further, the influence of arguments and peripheral cues is moderated by the amount of elaboration that occurs in response to a communication. Due to this, factors that directly influence elaboration (and thereby establish the presence/absence of the central and peripheral routes) are important determinants of the outcome of the persuasion process. In the ELM, the influence of such factors is represented via their effect on one's
motivation and/or ability to process the communication. In this regard, prior product knowledge is expected to affect ability and (indirectly) motivation to process a message, and thus influence the amount and direction of message elaboration. We next consider the role of prior knowledge as a moderator of elaboration, and review the available evidence.

**CONSUMER KNOWLEDGE AND ADVERTISEMENT ELABORATION**

By affecting one's ability and motivation to process a message, prior knowledge not only influences the amount of elaboration, but also the type of this elaboration. In the following discussion, we will first focus on knowledge effects on the amount of issue-relevant thinking, and then consider (a) how the lack of such knowledge leads to an increased reliance on peripheral cues, and (b) when issue-relevant thinking predominates, how prior knowledge also determines the direction of such thinking and the formation of brand attitudes.

**Effect on Amount of Brand-Related Thinking**

It is known that prior knowledge can enhance elaboration of product information. Due to their superior ability to understand and use product information for various tasks, higher knowledge (HK) consumers possess a distinct advantage over novices in this respect. This depth of analysis "edge"
that has been recognized by various authors (e.g., Alba and Hutchinson 1987; Olson 1980) is considered here in the context of advertisement processing.

One of the first studies to explicitly consider the role of prior product knowledge in persuasion was reported by Edell and Mitchell (1978). They reasoned that, since thinking (or cognitive response generation) is stimulated by the interaction of stored knowledge with incoming information, HK subjects, by drawing upon their superior knowledge base, should generate more reactions (i.e., support and counterarguments) to the ad claims. In a study they conducted using silver polish as the product, subjects were initially classified into high or low product knowledge conditions based on a pre-study questionnaire that asked them to list (a) prior purchase frequency, and (b) brand names and product attributes that they were aware of. Subjects who reported at least two purchases or uses of silver polish, or listed two or more product attributes, were assigned to the HK condition. The remaining subjects were assigned randomly to either knowledge condition. All subjects assigned to the HK condition were additionally asked to memorize three pages of product information before processing an ad for silver polish. Presumably, the learning task was intended to enhance knowledge differences between the two groups.

Edell and Mitchell found that HK subjects reported more counterarguments, but not support arguments, in response to the silver polish ad. This finding lends some credence to the expectation of a positive relation between knowledge and amount of brand-related thinking. But one
might question why HK subjects did not generate more support arguments, since by Edell and Mitchell's reasoning, greater knowledge should enhance production of both support and counter arguments. One explanation for this is that the advertising claims used in their study were rather weak—this would result in few support arguments being generated by either novice or HK subjects. In fact, their results reveal that subjects produced three times as many counterarguments as support arguments. Given this is the case, it would be reasonable to ask why novices, not recognizing the weak nature of the claims, should not have reported more SAs than HK subjects. Edell and Mitchell suggest that this could be due to novices lacking the product knowledge necessary to support the ad claims.

Other authors have also suggested that a lack of prior knowledge can inhibit the extent of message elaboration, and so decrease the number of reactions generated. MacInnis and Jaworski (1989) define ability to process as the skill or proficiency in interpreting brand information from an ad; and since this proficiency is dependent on the existence of prior knowledge, its absence reduces the elaboration of incoming brand information. Batra and Ray (1986b) proposed that knowledge about the product category, brand, or the ad itself can serve to enhance the amount of thinking. However, other than the Edell and Mitchell (1978) study, very little empirical evidence exists in the consumer literature that substantiates this hypothesis.¹

¹ Maheswaran and Sternthal (1990) report that both novice and HK subjects reported a substantial amount of thought in their study. When type of message (i.e., whether attributes or benefits were described) was considered, however, HK
In considering whether greater knowledge will lead to more thinking, it is useful to weigh the correspondence between the construct “amount of thinking” and the commonly used measured variable “number of cognitive responses.” Consider the following conceptualization of cognitive response by Cacioppo, Harkins and Petty (1981):

“...a cognitive response refers to a unit of information pertaining to an object or issue that is the result of cognitive processing. Cognitive processes refer to such information processing and structuring activity as perceiving, abstracting, judging, elaborating, rehearsing, and recalling from memory...Cognitive responses are the results of information processing and structuring activity and thus consist of responses such as recognitions, associations, elaborations, ideas, and images.” (p.37)

It is clear from these statements that current theorizing about cognitive response characterizes it as representative of most, if not all cognitive processes, including those that have to do with perceiving incoming information as well as elaborating on it. It is then reasonable to expect a consumer’s thought output to represent the more basic cognitive processes (such as recognition) as well as those dealing with association and elaboration.

subjects produced more thoughts than novices in response to the attribute-based message. The opposite was true for the benefit-based message. Given that knowledge is expected to enhance comprehension, it should play a beneficial role in the interpretation of attribute information—while the need for prior knowledge is less critical when the message simply states the benefits of the product in layman’s terms.
With this in mind, consider that, for a previously unfamiliar advertisement, both HK consumers and novices would have to begin processing information at the same basic level—that is, even a HK consumer can only elaborate on information after initially processing individual ad elements. At this stage of initial processing, which involves cognitive processes such as object identification or recognition, we may not observe differences in HK consumers' and novices' processing of individual units of information. At a somewhat higher level, such as the comprehension stage, prior knowledge can act as a facilitator that enhances the amount of subsequent processing (Alba 1983). A HK consumer may attend to an advertisement, comprehend its product-related content, and proceed to engage in higher levels of elaboration while a novice, not understanding the product information (e.g., technical details), may either focus on other aspects of the advertisement (e.g., an attractive model) or terminate processing altogether. Beyond comprehension, further elaboration would also necessitate the use of an existing knowledge base which HK consumers, by definition, possess. At the comprehension and elaboration stages, then, differences in the amount of brand-related thought between HK consumers and novices should become evident.

By virtue of such differences in comprehension and elaboration, it is tempting to predict that greater knowledge enhances the generation of brand cognitive responses. However, this proposition is predicated on the assumption of a one-to-one correspondence between amount of brand
thinking and cognitive response reporting. It can be questioned, however, that when novices produce X number of responses (that are representative of basic cognitive processes), and HK subjects produce X+Y responses where Y is the number of responses based on greater comprehension and elaboration, whether it is reasonable to expect both novices and HK subjects to report equal proportions of the X responses. We argue that HK subjects, instead, will tend to skip reporting of the more basic responses in favor of those more complex. This is due, at least partly, to the overlap between basic and complex responses. For example, a novice who accomplishes object identification of an advertised camera but is unable to further identify the type of camera may simply report “camera” as a X type cognitive response. But a HK subject who also identifies the camera as a 35mm SLR is unlikely to report the above X type response and the Y type response: “35mm SLR.” Rather, the reporting of the Y response by itself implies that processing indicated by X type responses has taken place.

Despite our general pessimism about obtaining differences in amount of brand thought due to knowledge, such an effect may materialize depending on the level of certain other external factors. These factors may operate on either HK subjects or novices (but not both), thereby affecting brand-related thought for one group. One such factor is the level of discrepancy between the ad claims and prior knowledge. Sujan (1985) found that HK subjects generated more product thoughts than novices only when the claims were discrepant from subjects’ product category knowledge. HK subjects were able
to recognize and react to the discrepant ad, given their prior knowledge base. Supporting evidence is also available from Toy (1982), who varied discrepancy between the message and subjects' prior beliefs on the topic, and found that counterargumentation increased with discrepancy.

In light of this, consider the manner in which claim manipulations are typically operationalized—weak claims imply the use of specious arguments that can be more easily counterargued. In an advertising context, using such counterarguable claims implies a discrepancy between what the recipient knows and believes and what the ad says. Further, when prior product knowledge is instrumental to recognizing such a discrepancy, it is reasonable to expect that novices are less likely than HK subjects to react to the discrepancy. Thus, at an aggregate level, one may not observe differences in amount of brand thought between HK subjects and novices, but differences may emerge where there is a discrepancy between the claims and prior knowledge (e.g., when weak claims are used). This explanation can also account for Edell and Mitchell's finding that HK subjects generated more counterarguments but not support arguments—given the claims were relatively weak and therefore discrepant from prior knowledge.²

But what of situations when such discrepancy is not the case? Given the previously noted limitation of cognitive response measures to accurately

² Note that HK subjects may not generate more support arguments than novices within the strong claims condition. We believe this is likely to be true because, unlike the process of refuting information that is inconsistent with prior knowledge, HK subjects may not find it necessary to affirm ad claims that are consistent.
portray amount of thinking, how does one establish whether knowledge really enhances brand-related thinking? One way of getting around this problem involves modifying the conventional approach to coding cognitive responses. Currently, in counting the number of responses generated, subjects' protocols are typically decomposed into individual responses based on the number of ideas stated. Using the camera example, both "camera" and "35mm SLR" are treated alike in terms of number of thoughts generated, even though camera identification is implicit in the latter response. For cognitive response measures to accurately portray the amount of elaboration during processing, it may be necessary to give explicit recognition that lower levels of processing have occurred when a response such as "35mm SLR" is reported. However, this approach is fraught with difficulty. How many levels of cognitive processing should be used? What words or phrases should be used to indicate the presence of any such level of processing? Is a serial processing assumption justifiable, i.e., is processing always characterized by a fixed series of consecutive stages without deviation (see Greenwald and Leavitt 1984 for a discussion)? These issues could well be the focus of an entire stream of research.

An alternative, and presently more viable, approach is to break down the relationship between knowledge and amount of thinking based on the level of abstraction of thought generated. That is, rather than combine all types of brand-related thought into one category, such thought may be split into different categories depending on the extent of higher level cognitive
processes that occurred. Along these lines, Marks and Olson (1981) argued that HK subjects' ability to generate more reactions to a persuasive message might be offset by the qualitatively different nature of their cognitive processing. They proposed that knowledge should facilitate chunking (i.e., forming abstract concepts). Due to chunking, HK subjects' thoughts should represent broader concepts, which implies fewer (but more abstract) cognitive responses generated relative to novices. In a study conducted to test this hypothesis, they exposed college secretaries (high knowledge) and students (low knowledge) to a promotional slide-show presentation for a new office chair. Their results indicated that while secretaries did not differ from students in total responses generated, the secretaries did generate fewer counterarguments. While this would appear consistent with their hypothesis, whether the secretaries' counterarguments were more abstract was not reported. It is possible that, since the message was professionally developed and presumably contained reasonably strong claims, secretaries may have better understood, by virtue of their superior knowledge, the persuasive claims, and therefore generated fewer counterarguments.

Although we agree with Marks and Olson (1981) that HK subjects should be able to generate more abstract thoughts, it is not clear why this should necessarily result in HK subjects generating fewer total thoughts than novices. We noted earlier that HK subjects' greater comprehension and

Celsi and Olson (1988) also predicted a similar effect of domain knowledge on inferential thought. They found a significant positive association between knowledge and the proportion of inferential thought to total thought.
elaboration would enhance thinking. On the other hand, we argued that this enhanced thinking may not be reflected in amount of total thought reported, due to HK subjects under-reporting thoughts representative of basic cognitive processes—such as recognition. The actual outcome would therefore hinge on whether novices' reporting of X responses is sufficiently greater than that of HK subjects to offset the Y responses reported by HK subjects. As it is impossible to predict when this will happen, novices and HK subjects may not differ in terms of total thought, except in conditions characterized by the presence of a factor such as claim discrepancy. But it is appropriate to consider differences between HK subjects and novices in terms of abstractions (Y responses) generated, after classifying the X responses separately.

To categorize brand-related thoughts by level of abstraction, Chattopadhyay and Alba (1988) suggested a four-tier scheme:

(a) **Factual Details** (i.e., replay of ad content). Such statements contain virtually no modification of ad content.

(b) **Single-Fact Interpretations**. Statements representing the subjective interpretation (either evaluative or non-evaluative) of individual attributes.

(c) **Abstractions**. Statements that summarize or generalize specific attributes.

(d) **Global Evaluations**. Statements of overall judgement.

By this scheme, thoughts classified as either single-fact interpretations or abstractions involve the activation of prior knowledge. We exclude global
evaluations because, given their status as indicators of brand attitude rather than cognitive processing (see Wright 1980), such evaluations are equally likely to be generated by both HK subjects and novices. Evidence for this is available from Sujan (1985), who found no difference in the number of global evaluations generated by HK subjects versus novices.

Based on the above discussion, it is hypothesized that:

H1A: HK SUBJECTS WILL GENERATE MORE COUNTERARGUMENTS THAN NOVICES WHEN EXPOSED TO WEAK CLAIMS.

H1B: AS PRIOR PRODUCT KNOWLEDGE INCREASES, THE NUMBER OF SINGLE-FACT INTERPRETATIONS AND ABSTRACTIONS WILL INCREASE.

Does Knowledge Moderate the Role of Brand and Ad Thoughts as Mediators?

Although early research on cognitive responses focused solely on two types of thoughts—support and counterarguments, researchers have since acknowledged the importance of studying ad-related thoughts and their role as mediators of advertising effects on brand attitude (e.g., Hastak and Olson 1989; Miniard, Bhatla, Lord, Dickson and Unnava 1990; see also MacInnis and Jaworski 1989). For example, one may react negatively to an unattractive picture in an advertisement which, while not registering an effect on support or counterarguments, may influence brand attitudes through the generation of negative ad-related thoughts. Given their potential importance as a mediator of advertising effects, it is useful to consider how ad thoughts' mediating role may be influenced by prior product knowledge.
We expect that a lack of knowledge will enhance the likelihood of novices adopting peripheral route processing. Some evidence for this is also available from Celsi and Olson (1988), who found that, as knowledge decreases, product-related thought declines as a proportion of total thought. Greenwald and Leavitt (1984) also note in their analysis of different levels of processing involvement that a competence constraint would necessarily prevent novices from initiating higher levels of elaboration. By their inability to use the available product information for forming brand evaluations, it follows that novices are more likely to adopt the peripheral route and base their evaluations on peripheral stimuli. On the other hand, HK subjects, not limited by their ability to elaborate on product information, are more likely to base their brand evaluations on their brand-related thoughts.

H2A: PRIOR KNOWLEDGE IS POSITIVELY RELATED TO THE ABILITY OF BRAND-RELATED THOUGHTS TO PREDICT POST-COMMUNICATION BRAND ATTITUDES.

H2B: PRIOR KNOWLEDGE IS INVERSELY RELATED TO THE ABILITY OF AD-RELATED THOUGHTS TO PREDICT POST-COMMUNICATION BRAND ATTITUDES.

Effect of Knowledge on Valence and Origin of Brand-Related Thought

In order to better understand the persuasive effects of an advertisement, it is useful to also consider how prior knowledge can moderate the extent of support and counterarguing by consumers in response to an ad's claims. Due to the difference in prior knowledge available during processing, a HK
consumer and a novice may respond quite differently to the incoming information. An ad that touts "you can't buy a stronger pain-reliever than Brand A" might elicit the following response from an infrequent user as opposed to a doctor.

**Infrequent User:** "Brand A seems to be the best solution for my headaches."

**Doctor:** "Brand A's strength is the same as Brand B and C—the only reason you can't buy a stronger non-prescription medicine is because of FDA regulations!"

It was noted earlier that Edell and Mitchell (1978) found that HK subjects, relative to novices, were more likely to counterargue a message. Assuming that the ad claims used in their study were weak, this result would suggest that the HK subjects were able to better discern the weakness of the claims and counterargue them more than novices. We contend that while consumer knowledge will facilitate the comprehension of product information, HK subjects' susceptibility to the persuasive communication may be more or less than that of novices, depending on the strength of the ad's claims. For an ad that communicates powerful claims, HK subjects should be more susceptible to its effects by virtue of their increased comprehension. For the same reason, HK subjects are more likely than novices to reject an ad's claims when they are weak.

**H3a:** HK SUBJECTS' VALENCED BRAND-RELATED THOUGHT WILL SHOW MORE SENSITIVITY TO VARIATIONS IN CLAIM STRENGTH RELATIVE TO NOVICES.
H3B: HK SUBJECTS’ POST-COMMUNICATION BRAND ATTITUDE WILL SHOW MORE SENSITIVITY TO VARIATIONS IN CLAIM STRENGTH RELATIVE TO NOVICES.

With regard to the origin of the cognitive responses produced during ad processing, Greenwald (1968) differentiated between whether the verbalized thoughts were message-originated, modified message-originated, or recipient-generated. Message-originated (M-O) thoughts are defined as direct restatements or paraphrases of the communication; modified message-originated (M-M-O) thoughts are reactions to, qualifications, or illustrations of the material in the communication; and recipient-generated (R-G) thoughts are statements expressing ideas or reactions pertinent to the issue but not traceable directly to the communication (Cacioppo, Harkins and Petty 1981). The basis of distinction between these categories is the extent to which additional information (originating from the receiver rather than the message itself) is brought into consideration during message processing. Thus, origin of thought can vary along a continuum of which one extreme represents passive replay of message information, and the other represents original thinking with regard to the advertised product.

The significance of this distinction lies in the relative importance of these categories in serving as causal agents in persuasion. For any advertisement, understanding when a recipient’s M-O, M-M-O, or R-G thoughts are influential in determining attitude has direct implications for the advertiser’s ability to enhance persuasion. If M-O thoughts are influential (as might be
the case when novices engage in little or no elaboration), variables within the communication (e.g., use of a celebrity endorser) may be manipulated to enhance the favorability of these thoughts. Where M-M-O or R-G thoughts (those that HK subjects bring to bear through the activation of relevant knowledge bases) are more influential, an advertiser may want to anticipate these thoughts through pretesting, and develop ad claims that counterargue negative M-M-O or R-G thoughts and/or encourage such thoughts of a positive nature. Therefore, an understanding of the relative influence of these types of thoughts can facilitate the development of effective advertising.

Greenwald (1968) theorized that R-G thoughts should be more influential in determining persuasion. In an experiment conducted by Greenwald and Albert (1968), subjects rated their own thoughts as more original than those generated by others, and were able to recall their own thoughts better. In explaining these findings, Greenwald suggested that perceptions of the self as the source of cognitive responses might increase the importance of such responses as determinants of persuasion. Although Greenwald found that R-G thoughts were most strongly related to attitude, other studies (Calder, Insko and Yandell 1974; Roberts and Maccoby 1973) have found that M-O thoughts are more influential, while Wright (1973) found both M-M-O and R-G thoughts to be influential. More recently, Cacioppo et al. (1981) suggested that the relative importance of these categories of thought in determining persuasion may be moderated by the extent of prior knowledge about the issue, although they did not elaborate as to why this was expected.
The reasoning that differences in recipient knowledge could moderate the influence of M-O, M-M-O and R-G thoughts may explain the discrepant findings reported on this issue. In both studies where M-M-O and R-G thoughts were more influential (Greenwald 1968; Wright 1973), subjects were reasonably knowledgeable about the subject of the communication. In Greenwald's study, the subjects were undergraduate students who were exposed to a message about general versus specialized undergraduate education, while in Wright's study, adult women were exposed to a message about soybean-based food products. Comparatively, one of the studies reporting a stronger influence of M-O thoughts was conducted in settings that appear to involve less knowledgeable subjects. In Roberts and Maccoby (1973), undergraduate students were exposed to a message advocating the removal of editorial and "persuasive" content from newscasts, an issue that college students in general may not be highly knowledgeable about. However, in the study reported by Calder et al. (1974), undergraduate students played the role of jury members who were exposed to arguments presented by the prosecution and defense in a legal trial. The legal issues of the trial were not described, and it is not clear whether the students would have been knowledgeable about these issues.

We believe that M-M-O and R-G thoughts are likely to exert a greater influence on HK subjects' than novices' brand attitude. As discussed earlier, HK subjects' superior comprehension abilities should enhance the amount of message-related thinking. Further, this increase in thinking should be
positively reflected in the number of M-M-O and R-G thoughts generated (relative to M-O thoughts), as the enhanced elaboration will necessarily involve going beyond mere rehearsal of the message content. HK subjects' superior knowledge may also make them more confident in their ability to form brand judgments. Given the bias toward favoring one's own thoughts as noted by Greenwald, combined with the increased confidence due to knowledge, HK subjects should rely on these thoughts in arriving at a brand evaluation. To the contrary, novices' focus and reliance on peripheral aspects of the ad should reduce the number and influence of these thoughts in persuasion. Thus M-M-O and R-G thoughts should be superior mediators of advertising effects on post-communication brand attitude for HK subjects relative to novices.

It is hypothesized that:

H4A: AS PRIOR KNOWLEDGE INCREASES, THE NUMBER OF MODIFIED MESSAGE-ORIGINATED AND RECIPIENT-GENERATED THOUGHTS WILL INCREASE.

H4B: FOR HK SUBJECTS, VALENced INDICES OF MODIFIED MESSAGE-ORIGINATED AND RECIPIENT-GENERATED THOUGHTS WILL BETTER PREDICT POST-COMmUNICATION BRAND ATTITUDE COMPARED TO NOVICES.

H5: HK SUBJECTS, RELATIVE TO NOVICES, WILL EXPRESS GREATER CONFIDENCE IN THEIR RESPECTIVE ABILITY TO EVALUATE THE BRAND.
Knowledge and Involvement

Prior Knowledge X Processing Involvement Interactions. For an advertisement to induce persuasion via the central route, the ELM specifies that two conditions be met—the recipient must have both the motivation and ability to process the message. The hypotheses proposed earlier about the effect of knowledge presumed the existence of sufficient motivation to activate and use that knowledge during advertisement elaboration. In this section we first consider how the effects of knowledge change when processing motivation is absent.

When lack of processing motivation leads to adoption of the peripheral route to persuasion, brand evaluation is more heavily based on peripheral cues (Petty and Cacioppo 1986). With low motivation, given a reduced consideration of message claims, the knowledge possessed by HK consumers is of less consequence during ad processing. Therefore, the effects of knowledge proposed in H1 should weaken under low involvement.

It is worth noting that we do not necessarily expect prior knowledge effects to completely disappear in the absence of high processing motivation—for two reasons. First, as discussed later in this section, product knowledge is typically concomitant with a moderate to high level of sustained interest in the product category. This type of enduring interest has been termed as product involvement—as opposed to processing involvement—in the literature (Richins and Bloch 1986). Due to product involvement, the target
audience for an advertisement may itself generate a minimal level of processing motivation, regardless that such motivation is not provided by experimental manipulation. The extent of this can be assessed by examining differences in HK subjects' and novices self-reported involvement during ad processing.

Second, Alba and Hutchinson (1987) note the substantial evidence for an inverse relation between expertise and task effort. Prior familiarity with the product category significantly reduces the amount of cognitive resources required to complete a task such as message processing—due to this, HK subjects do not require as much motivation as novices to process the same amount of information. Therefore, even in the absence of externally provided processing motivation, given HK subjects' intrinsic interest in the product and the relatively fewer cognitive resources that they require for processing product information, knowledge effects on cognitive response and brand attitude are possible (albeit diminished) under low processing involvement. This rationale applies to the effects proposed in H1 and subsequent hypotheses that are addressed below.

H2 proposes that knowledge will enhance the role of brand thoughts at the expense of ad thoughts as a determinant of attitude formation. The diminished importance of knowledge under peripheral route processing leads us to expect an attenuation of the effect in H2 as involvement decreases. In other words, brand thoughts will become less influential in mediating attitude formation for both HK subjects and novices when ad processing
occurs in the absence of high involvement. Similarly, with regard to H3, HK subjects are less likely to use their knowledge to discriminate between strong and weak claims under low involvement, consequently diminishing the difference between HK subjects' and novices' valence of thought and brand attitudes.

In H4 it is predicted that greater knowledge would result in more self-generated thoughts, which would also be more influential in determining attitude. In the absence of motivation to activate this knowledge, this hypothesis should also be moderated by involvement. Therefore, it is hypothesized that:

H6: THE EFFECTS PROPOSED IN H1, H2, H3, AND H4 SHOULD BE ATTENUATED UNDER LOW PROCESSING INVOLVEMENT.

The Role of Product Involvement. Another issue of interest is the interrelationship between prior product knowledge, motivation to process an advertisement, and product involvement. Richins and Bloch (1986) define product involvement as "representing an ongoing concern with a product that transcends situational influences," and which is "motivated by the degree to which the product relates to the self and/or the hedonic pleasure received from the product." Prior research has observed the positive influence of product involvement on motivation to process an ad for that product (e.g., Celsi and Olson 1988). For example, even if the video hobbyist is not presently engaged in purchase-related decision making for, say, a video
camera, her/his enduring interest in the product is capable of raising the level of processing motivation during an incidental exposure to a camera ad.

Other authors have noted the typically concurrent incidence of knowledge about, and involvement with a product in real consumption environments (Batra and Ray 1986b; Lutz, MacKenzie and Belch 1983). This relationship can be bi-directional; just as interest in the product category can motivate one to acquire knowledge about it, so can stored product knowledge ease the acquisition of further information and increase interest in the product.

While these facts suggest a causal bi-directional relationship between product knowledge and product involvement, evidence of this is unavailable. Testing this relationship in either direction necessitates a manipulation of one of the two constructs. In this study, we accomplish this by varying product knowledge. For two groups of randomly assigned subjects, if an increase in the knowledge of one group leads to greater product involvement or vice versa, a causal relation is suggested.

Further, given the positive effect of knowledge on product involvement, and of product involvement on processing motivation, it is possible to erroneously conclude that knowledge directly affects processing motivation, especially if no measure of product involvement is taken. We expect that, while knowledge positively influences product involvement, and product involvement similarly can increase processing motivation, product knowledge will not otherwise have any impact on motivation to process. In the study reported here, we test this hypothesis by assessing the ability of the product
involvement construct to account for any observed effects of prior knowledge on motivation to process.

H7A: PRODUCT KNOWLEDGE WILL INCREASE PRODUCT INVOLVEMENT, WHICH IN TURN WILL ENHANCE PROCESSING MOTIVATION.

H7B: PRODUCT KNOWLEDGE WILL NOT INFLUENCE PROCESSING MOTIVATION OTHER THAN ITS EFFECT THROUGH PRODUCT INVOLVEMENT.
Overview

The nature of the knowledge manipulation necessitated conducting the study over a period of seven weeks. For the first five weeks, subjects in the HK condition were given product information about home burglar alarm systems, and asked to complete assignments demonstrating their level of learning. In the sixth week, an exam on this knowledge base further reinforced their learning. The experiment, in which subjects were exposed to an ad for an alarm system and responded to various measures, was conducted in the seventh week.

Subjects and Design

224 students enrolled in undergraduate marketing classes at a major midwestern university participated in the study for extra course credit. Subjects were assigned randomly to the cells of a 2 (Involvement: high, low) x 2 (Claim Strength: strong, weak) x 2 (Prior Knowledge: high, low) between-subjects factorial design. For the experiment in the seventh week, sessions were run with small groups of five to ten subjects, with all three experimental manipulations combined in each session.
Procedure

Details of the six week long knowledge manipulation are described later. For the experiment, subjects were seated in front of partitioned tables that contained a stack of numbered folders. A cover sheet on top of the folders informed subjects that they were about to participate in an advertising study. They were also instructed to work through the folders at their own pace, with the restriction that once they were finished with a particular folder, it was to be moved to the bottom of the stack and not opened again.

In the first folder, subjects encountered a set of nine filler ads (included for reasons described later). These ads were preceded by a page that instructed subjects on how to process the ads. For subjects in the low involvement condition, the critical ad appeared immediately after the filler ads in the same folder. High involvement subjects encountered the critical ad in a separate folder after the filler ads, preceded by a page of instructions on how to process the ad.

The filler ads in the first folder consisted of three ads for each of three product categories: vacuum cleaners, automobiles, and alarm systems. The professionally-finished $8\frac{1}{2}$" x 11" critical ad began with a statement in large type "This can happen to you . . ." that was placed next to a color picture. The picture showed a distressed couple sitting in the living room of their

---

4 To avoid any contamination of the filler alarm system ads on the dependent measures, these ads were devoid of any copy. All three ads were mostly pictorial, accompanied by a either a general slogan or a pitch urging the reader to consider the advertised brand. As explained later, filler alarm system ads were included to protect the involvement manipulation.
ransacked home that evidently had been burglarized. The opening statement was continued below the picture with "...if you don't get the GUARDIAN home burglar alarm system." The bottom half of the ad contained a number of claims pertaining to various features of the alarm system, and a smaller color picture of the product itself. The ad ended by urging the reader to "Call your local dealer today!"

The next folder held a questionnaire that contained all the dependent measures collected for this study. After subjects completed the questionnaire, an instruction on the last page asked them to wait quietly till everybody was done. Finally, they were urged not to discuss the session with others until the experiment was completed, thanked for participating, and dismissed.

**Independent Variables**

**Involvement.** Subjects' processing motivation while reading the critical ad was manipulated through differing instructions given in the high and low involvement conditions. Low involvement subjects encountered a single set of instructions prior to the filler ads and critical ad (all placed in the same folder). High involvement subjects received one instruction set prior to the filler ads, and a second instruction set prior to the critical ad. Based on pretest feedback, the following version of the involvement instructions was used in the experiment.
**Low Involvement Instructions**

The purpose of this research is to expose you to advertisements that are still in early stages of development. Your first task is to look at the ads contained in this folder.

We would like you to pretend that you are relaxing at home, and look at the ads as if you were browsing through a magazine. It is very important that you look at the ads in a "natural and relaxed state of mind" - pay no more attention to them than you normally would in casually looking through a magazine. Later, we will ask you how much you like or dislike these ads.

Please look at the ads in the order they are presented. Do not flip back and forth between ads. After you finish looking at the ads, close this folder, move it to the bottom of the stack, and open the next folder.

**High Involvement Instructions**

First instruction set:

The purpose of this research is to obtain your reactions to advertisements that are still in early stages of development. Your first task is to look at the ads contained in this folder. Later, we will ask you how much you like or dislike these ads.

Please look at the ads in the order they are presented. Do not flip back and forth between ads. After you finish, close this folder, move it to the bottom of the stack, and open the next folder.

Second instruction set:

This folder also contains an ad. Your task is to examine the ad very carefully and form an evaluation of the advertised product. We want you to carefully examine the evidence presented in the ad, and make a judgment about it—how good or bad is it?

It may help to imagine that you are currently interested in making a purchase in this product category, and are trying to decide which brand is the best. Take as much time as you need to examine the ad. You will then be asked about your opinion of the advertised product.

After you finish examining the ad, close this folder, move it to the bottom of the stack, and open the next folder.
One concern in implementing the manipulation was the likelihood that in the HK condition, subjects’ interest in the critical ad would be piqued by their prior learning about the product category. Such an enhancement of motivation could conceivably dampen the involvement manipulation for HK subjects. Two strategies were devised to counter these potential problems. One was the inclusion of several filler ads, some of which advertised alarm systems. Having first encountered the filler alarm system ads, it was hoped that the initial heightening of interest on encountering an alarm system ad would be at least partially attenuated by the time HK subjects encountered the critical ad. Second, in the high involvement condition, we attempted to enhance subjects’ involvement above and beyond knowledge effects by placing the critical ad in a separate folder and preceding it by a separate set of processing instructions.

To assess the effectiveness of the involvement instructions planned for use in the experiment, we conducted a pretest with 91 subjects (who had previously participated in the longitudinal knowledge manipulation). They were instructed to process a set of six filler ads, followed by the critical ad. Low involvement subjects encountered all seven ads in the same folder, while high involvement subjects received separate instructions preceding the critical ad in a separate folder. Subjects’ self-reported processing involvement was measured on six 7-point scales (four semantic differential scales anchored by: very involved—very uninvolved, concentrating very hard—concentrating very little, paying a lot of attention—paying very little
attention, thinking about the product—thinking about something else; and two Likert scales: “I carefully considered the claims made about GUARDIAN in the ad” and “I was trying to form an accurate impression of the product”). These scales were averaged for analysis (Cronbach’s α = .91).

The pretest results indicated that although the means were significantly different (F = 11.8, p < .001) between the two involvement conditions, they were not very far apart (M = 0.53 for low involvement and 1.34 for high involvement). The interaction between knowledge and involvement was not significant (F = 2.1, p < .2) Further analysis of self-reported involvement within each knowledge condition revealed that, while the involvement manipulation was successful for HK subjects (M = 0.55 for low involvement and 1.70 for high involvement; F = 11.8, p < .001), it was less so for novices (M = 0.51 for low involvement and 0.96 for high involvement; F = 1.8, p < .1 using a 1-tailed test). In an effort to further reduce the motivation of low involvement subjects, it was decided to increase the number of filler ads in the main study from six to nine. It should also be noted that the success of the involvement manipulation within the HK condition rendered our earlier concern about the “dampening” effect of knowledge to be without merit.

Claim Strength. This manipulation was implemented by varying the claims made in the advertisement about the Guardian alarm system. Each claim consisted of a heading in large type, followed by 10–20 words of copy

5 These and all subsequent means are based on 7-point scales ranging from -3 to +3 unless otherwise specified.
substantiating the claim. By varying the substantiation, we created strong or weak versions of each claim.6 The claims and substantiations are presented in Figure 2.

In a pretest, we exposed 91 subjects (who had been subject to the knowledge manipulation) to either the strong or weak version of 11 claims about Guardian and assessed their ratings of each claim, in addition to their evaluation of attribute importance. We also sought feedback on subjects' assessment of each claim separately via a series of semantic differential scales. Although the claims manipulation was successful ($F = 53.7, p < .001$), the mean rating of the weak version of the claims was at the scale midpoint ($M = 0.16$), while the rating of the strong version was 1.78. Further, the effect of the claims manipulation did not vary by knowledge condition ($p > .6$). This latter result was unexpected, since HK subjects were anticipated to be more sensitive to the claims manipulation relative to novices. In retrospect, this was due to the claims being easily comprehensible even by novices.

Consequently, based on subjects' feedback, we revised the claim substantiations and presented a set of 9 claims to 97 subjects in a second pretest. Their evaluations of the strong ($M = 1.21$) and weak claims ($M = -0.66$) were significantly different ($F = 73.3, p < .001$). A significant

---

6 Prior research has typically operationalized the claims manipulation by varying the attributes included in the strong and weak versions. As Areni and Lutz (1988) have pointed out, such manipulations confound variations in attribute strength and attribute valence. In this research, both versions of the claims were identical in terms of attribute valence—only the strength of each claim was varied through its substantiation.
interaction ($F = 18.6, p < .001$) between claims and knowledge was also obtained. HK subjects were more sensitive to variations in the claims ($F = 88.5, p < .001; M_s = -1.31$ versus $1.40$ for weak and strong claims respectively) relative to novices ($F = 8.8, p < .01; M_s = 0.14$ versus $1.03$). From this set of claims, we selected eight for use in the main study. Of these, the substantiation for the price claim was held constant across conditions. This was done to alleviate the possibility that subjects might otherwise make widely disparate assumptions about price which, by affecting product evaluations, increases error variance.

Prior Product Knowledge. The goal of this manipulation was to create two groups of subjects differing in their knowledge with respect to the product category in which they would subsequently process an ad. In choosing the product category, we adopted the following criteria. First, the product had to be one that students would be initially unfamiliar with so that, by increasing the knowledge of subjects in the HK condition, we could achieve a meaningful difference in knowledge between the two conditions. Yet, the product had to be one that students could relate to and be realistically expected to consider purchasing at some point in the future. This would also be key to motivating subjects to acquire the knowledge in the first instance. Finally, the product had to be such that, without actually having students use the product, it would be possible to let them achieve a thorough understanding of its use.
We initially assessed students' self-reported prior knowledge about 12 different product categories, ranging from lawn care services to vinyl floor coverings. This measure was administered to the 91 subjects who subsequently participated in the pretest of the knowledge manipulation. Based on these ratings, we selected two product categories—video cameras and home burglar alarm systems—whose average initial knowledge ratings were 3.6 and 3.1 respectively (9-point scale anchored by least knowledgeable—most knowledgeable). Although the final experiment required creating knowledge differences only with respect to alarm systems, the procedural aspects of the knowledge manipulation called for the use of two product categories (discussed subsequently).

Keeping in mind the content-oriented definition of knowledge described previously, we used Brucks' (1986) typology of knowledge as a framework to design a series of informational handouts that would convey the necessary product knowledge. With the exception of purchasing/decision making procedures,7 we incorporated the dimensions of Brucks' typology into five major content areas:

1. **Product Terminology:** meanings of terms specific to a product domain.

---

7 Brucks defines this category as "knowledge about the purchasing process." It includes personal purchase experiences as well as normative models of the purchase process. While such knowledge is very important to a consumer undertaking a purchase, we deemed it less relevant to studying the impact of consumer knowledge on ad processing, because this type of knowledge normally does not play a role in evaluating an advertised brand.
2. **Available Attributes**: knowledge of which attributes may be used for brand evaluation.

3. **Attribute-Based Evaluation**: specific criteria used to evaluate a brand on an attribute, e.g., reference points used to judge adequacy of a particular attribute level.

4. **Product Usage**: knowledge of the product's usage characteristics. Includes information on how usage characteristics relate to specific product features.

5. **Brand Facts**: how various brands perform on each of several attributes.

Based on a survey of multiple sources such as *Consumer Reports*, *Popular Science*, *Consumers’ Research*, *Popular Photography*, *Home Mechanix*, and *Popular Mechanics*, we compiled a set of five informational handouts for each product category. In addition to the product information, each handout also contained an assignment that not only reinforced students' learning, but encouraged them to think about how to use the product (see Appendix A for handouts on burglar alarm systems). Further, assignments in later handouts also required students to relate the information to earlier handouts to facilitate their developing a comprehensive and interlinked knowledge base. To ensure that the students were motivated to learn and integrate the information, and turn in the assignments, they were given extra course credit for each phase. Finally, an exam (for extra credit) given in the sixth week cemented the learning process.

Manipulating this factor required randomly assigning a class of students into HK and novice conditions. In order to convey product information to the HK group without raising the suspicions novice subjects, we actually
provided information to both groups, but for different product categories. Novice subjects received handouts on an unrelated product category—video cameras. The cover story used for the manipulation was that the students were participating in a (fictitious) "Research in Education Program" whose goal was to understand how students learn information, to aid educators in developing more sophisticated teaching methods. The use of two product categories was explained by the need to increase the generalizability of the research findings.

In a pretest of the knowledge manipulation, we assessed its effectiveness through a number of measures designed to tap subjective and objective knowledge (Brucks 1985), and specific abilities that arise out of such knowledge. The subjective knowledge measure was based on an average of four 7-point scales (α = .92). Subjects first rated their knowledge of home burglar alarm systems compared to the average consumer on two scales anchored by: one of the most knowledgeable—one of the least knowledgeable; and far above average—far below average. These were followed by two Likert scales: "I feel that I have enough knowledge about home burglar alarm systems to make an informed purchase decision," and "I am very knowledgeable about home burglar alarm systems." This subjective knowledge measure revealed a significant difference (F = 95.0, p < .001) between novice (M = -0.97) and HK (M = 1.34) subjects.

To tap objective knowledge, we administered a 10-item multiple choice exam. The ten items were based on various features/benefits and the use of
home alarm systems (see Appendix B). To reduce the effect of guessing, each item presented five answer choices, and each of the answers was carefully designed to appear equally realistic to the novice. On a scale ranging from 0 to 10 (representing the number of correct answers), the novice group (M = 1.88) scored significantly lower (F = 171.0, p < .001) than the HK group (M = 6.79).

To assess subjects' ability to use their knowledge, we used a ranking task in which subjects were given descriptions of three fictitious brands on five attributes. The descriptions were manipulated such that it was possible to obtain an objectively correct ranking. This was possible since the attributes were such that, regardless of individual preference, one level of each attribute was always more desirable than another (e.g., dual sensors are preferable to single sensors to minimize false alarms). Subjects were required to rank the three brands from best to worst. A chi-square analysis of the proportion of correct rankings for each knowledge group (87.5 versus 65.1 percent for high and novice subjects) revealed a significant superiority for HK subjects (χ² = 5.2, p < .05). Further, a measure assessing subjects' confidence in their rankings also revealed HK subjects (M = 1.67) to be significantly (F = 54.2, p < .001) more confident than novice subjects (M = -0.47).

---

8 The chance level for guessing the correct ranking was 16.7 percent. That 65 percent of subjects in the low knowledge group were able to rank the brands correctly appears to be, at least in part, due to the ease of the task. Specifically, three of the five attribute descriptions were worded in a manner such that virtually anybody could comprehend the difference (e.g., "professionally installed" versus "do-it-yourself").
Dependent Measures

This section describes measures collected in the main study. A copy of the questionnaire can be found in Appendix C. Immediately after exposure to the critical ad, subjects encountered a thought-listing measure that asked them to write down all the thoughts, ideas, and images that went through their minds while looking at the Guardian ad. A page containing 14 boxes measuring 6 1/2” x 5 5/8” each was provided for this purpose. Although no time limit was imposed, most subjects completed the task within 4–5 minutes.

In the next section, subjects first responded to four scales assessing subjective knowledge. Subjects rated their knowledge of home burglar alarm systems compared to the average consumer on two scales (one of the least knowledgeable—one of the most knowledgeable; far below average—far above average), and then indicated their agreement with two statements (“I feel that I have enough knowledge about home burglar alarm systems to make an informed purchase decision,” and “I am very knowledgeable about home burglar alarm systems”). These four scales were averaged for analysis ($\alpha = .93$). Then, subjects responded to two scales (very confident—not at all confident; very certain—very uncertain; $r = .77$) tapping their confidence in their response to the last subjective knowledge scale.

The next section contained several questions pertaining to subjects’ opinions about the Guardian alarm system. First, four scales (very good—very bad; very favorable—very unfavorable; like very much—dislike very
much; very positive—very negative; \( \alpha = .95 \) assessed their attitude toward the Guardian system. These were followed by two scales assessing confidence (same scales as before; \( r = .76 \)) in their attitude. Next, subjects indicated their attitude toward buying Guardian on three scales (very good—very bad; very foolish—very wise; very desirable—very undesirable; \( \alpha = .90 \)). Finally, three questions asked for subjects' best estimate of the price of Guardian, their confidence (same scales as before, \( r = .85 \)) in how closely their estimate corresponded exactly with the real price of Guardian, and how much they would be willing to pay for the system.

In the next section five scales were used to measure involvement while processing the Guardian ad. Subjects first responded to three scales (very involved—very uninvolved; concentrating very hard—concentrating very little; paying a lot of attention—paying very little attention), and then rated their agreement with two statements ("I carefully considered the claims made about Guardian in the ad," and "I was trying to form an accurate impression of the product"). These scales were averaged for analysis (\( \alpha = .93 \)).

Subjects then provided evaluations of each of the eight alarm system attributes (e.g., "For me, a burglar alarm system that has an adjustable entry/exit delay is:") used in the ad on two scales (very good—very bad and very desirable—very undesirable; average \( r = .82 \)). Beliefs about Guardian (e.g., "How likely is it that Guardian has an adjustable entry/exit delay feature?") were assessed on two scales (very likely—very unlikely and very probable—very improbable; average \( r = .97 \)) for each of the eight attributes.
Following this, on a blank page, subjects were instructed to write down everything they could remember about the claims made in Guardian ad, and also to describe the illustrations or pictures. Then, they responded to a 20-item scale assessing product involvement ($\alpha = .97$; Zaichkowsky 1985). Following Allen and Janiszewski (1989), we also administered a post-experimental inquiry that probed subjects' awareness of the purpose of the study, including its relation to the knowledge manipulation conducted over the previous six weeks. Ten subjects who guessed that differences in product knowledge might affect ad evaluation were eliminated from the analyses. These ten subjects were dispersed across the eight experimental conditions, with the largest number ($n = 3$) belonging to the high knowledge/low involvement/strong claims cell. This measure was followed by a question asking subjects if they had participated in any of the pretests. Eleven subjects were dropped on account of this measure. The analyses are based on the remaining 203 subjects.

**Coding of Recall Data**

Subjects' recall protocols were first broken down into individual elements corresponding to the ad's visual and verbal content. Each recalled element was then classified by two trained judges blind to experimental condition into one of the categories defined by a recall coding scheme (see Appendix D). At the broadest level of the classification procedure, the recall elements were assigned to one of six categories, depending on whether they pertained to the
ad claims, introductory and closing statements, brand name, ad pictures, or were irrelevant or unclassifiable. Then, within each category, recall elements were classified into one of the sub-categories (e.g., ad claims were broken down by specific claims and completeness of recall of the individual claim).

The total number of recalled elements was 1372 or 6.8 for each subject. Of these, 95 and 99 elements were judged irrelevant and unclassifiable respectively. The judges agreed in their classification on 99 percent of the recall elements—the remainder were resolved through discussion.

**Cognitive Response Coding**

Responses to the thought-listing task were classified by two judges blind to experimental condition using four separate coding schemes based on focus, valence, origin, and abstraction of thought (see Appendix E). First, the judges classified each thought depending on whether its focus was ad- or brand-related. Each thought was also assigned a positive, negative, or neutral valence. Then, brand thoughts were classified based on origin into one of four categories: message-originated, modified message-originated, recipient-generated thoughts, and unclassifiable. Finally, brand thoughts were also assigned a classification based on level of abstraction. Five categories were used for this purpose: factual details, single-fact interpretations, abstractions, global evaluations, and unclassifiable.

Subjects reported a total of 1102 thoughts (5.4 per subject), of which 469 were classified as ad-related, and 484 as brand-related. Of these, 29 and 74
thoughts were identified as overall evaluations of the ad and brand respectively. These were classified separately due to concerns of their being indicators of attitude rather than cognitive processing (see Wright 1980). The remaining 149 thoughts were classified as either irrelevant (n = 20), unclassifiable (n = 102), or relating to the longitudinal knowledge manipulation (n = 27). Ad and brand thoughts coded by valence resulted in 297 favorable, 164 neutral, and 492 thoughts unfavorable toward the ad or brand. With respect to origin, brand thoughts were classified as either message-originated (M-O; n = 35), modified message-originated (M-M-O; n = 355), or recipient-generated (R-G; n = 18). Two thoughts were unclassifiable. For level of abstraction, brand thoughts were classified as either factual details (n = 34), single-fact interpretations (SFI's; n = 177), abstractions (n = 197), or global evaluations (n = 74). Two thoughts were unclassifiable.

Reliability of the judges' classifications was computed separately for each of the four modes of classification. The overall inter-judge agreement rate was not used directly to assess reliability, as it can either underestimate or overestimate the actual level of agreement by treating disagreements between similar categories (e.g., ad-picture thoughts versus ad-copy thoughts) as equivalent to disagreements between relatively dissimilar categories (e.g., ad versus brand thoughts). Another source of bias is due to a lack of correction for chance levels of agreement. This chance level becomes more significant when some classification categories have a higher frequency of
occurrence (Jones, Johnson, Butler and Main 1983). To overcome the latter bias, we used the Perreault and Leigh (1989) index of reliability \( I_r \).

To avoid the first bias, we calculated \( I_r \) separately at each level of classification. The first level of classification involved judging each thought as either ad-related, brand-related, irrelevant, unclassifiable, or relating to the longitudinal knowledge manipulation (a total of 5 categories). At the second level, overall ad and brand evaluations were separated from other ad and brand thoughts (a total of 3 categories). Then, brand thoughts were classified based on origin and abstraction (4 and 5 categories respectively). Separately, ad and brand thoughts were also classified based on valence (3 categories). Table 1 presents the reliability index for each level of classification. In all five instances, the reliability is in the acceptable range (i.e., greater than 0.8; Perreault and Leigh 1989).

A note about the number of R-G thoughts is warranted. Subjects generated very few such thoughts compared to M-M-O thoughts. In fact, their brand-related thought was dominated by the latter category. In retrospect, this appears to be attributable to the nature of the claims and knowledge manipulations. The knowledge manipulation was designed to provide, among other information, a working knowledge of alarm system

\[
I_r = \left[\frac{(F_0/N) - (1/k)}{[k/(k-1)]}\right]^{1/5}
\]

where

- \( N \) = the total number of judgments made by each judge,
- \( F_0 \) = the number of judgments on which the judges agree, and
- \( k \) = the number of categories used for classification.
attributes. In designing the ad, we included claims that addressed virtually all of these attributes. While the claim manipulation worked effectively to vary subject's evaluation of the advertised alarm system, it also left no room for subjects to generate R-G thoughts, for example, about attributes of alarm systems not mentioned in the ad claims. Consequently, the most subjects could do was to react to the attribute information presented in the ad, which is reflected in the number of M-M-O thoughts reported.

Due to the extremely limited number of R-G thoughts reported, it was not reasonable to include this category in the analyses. Therefore, hypotheses related to origin of thought are tested only with respect to M-M-O thoughts. Finally, those thoughts that were classified as global evaluations (n=74) were excluded from analyses involving M-M-O thoughts. This was done for the same reason these thoughts were excluded from analyses involving brand thoughts—that they are considered indicative of attitude rather than cognitive response.
CHAPTER IV
RESULTS

Manipulation Checks

Table 2 presents the cell means for measures used to assess the effectiveness of the manipulations. The results of 3-way ANOVAS incorporating the three independent variables (processing involvement, claim strength, and product knowledge) on each of these measures are shown in Table 3.

Involvement. The processing involvement manipulation was designed to vary the amount of product-relevant thinking while processing the ad. If high involvement subjects exerted more effort in thinking about the product, their number of brand-related responses should be higher compared to low involvement. An ANOVA on the number of brand thoughts revealed that high involvement subjects ($M = 3.02$) generated a significantly higher ($F = 56.8$, $p < .001$) number relative to low involvement ($M = 1.05$). No other effects were significant.

Subjects’ self-reported involvement based on an average of five scales was analyzed via a 3-way ANOVA. A significant difference ($F = 81.1$, $p < .001$) was observed between low ($M = -0.22$) and high involvement ($M = 1.51$) subjects. The knowledge factor also exerted a significant effect ($F = 7.1$, $p < .01$) on this measure, with novices reporting a lower level of processing involvement.
(M = 0.34) than HK subjects (M = 0.89). As noted before, this is to be expected due the higher level of intrinsic interest in the product category by HK subjects. This effect of knowledge was qualified by a significant (F = 4.1, p < .05) interaction with involvement. HK subjects (M = 0.22) differed significantly (F = 10.1, p < .01) from novices (M = -0.68) under low involvement, but not in the high involvement condition (Ms = 1.56 and 1.45; F < 1). It appears that intrinsic motivation enhanced processing involvement in the absence of externally provided motivation, but did not play a role once sufficiently high external motivation was induced. Lastly, a significant interaction between involvement and claims emerged (F = 4.5, p < .05). Simple main effects tests revealed that, within the high involvement condition, the claims had a marginal effect on processing involvement (F = 3.3, p < .1; Ms = 1.76 versus 1.26 for weak and strong claims respectively). No such effect emerged within the low involvement condition (F = 2.7, p > .1; Ms = -0.43 versus -0.01).

Further evidence for the involvement manipulation is available from the ad recall task. Here we expected that high involvement subjects would demonstrate superior recall of the ad claims. An ANOVA on ad claim recall did show that high involvement subjects recalled an average of 5.9 claim elements while low involvement subjects only recalled 1.9 such elements (F = 112.4, p < .001). A significant interaction emerged again between involvement and claim strength (F = 4.2, p < .05). Within the high involvement condition, claims exerted a significant effect on ad recall
(F = 5.2, p < .05; Ms = 6.52 versus 5.30 for the weak and strong claims respectively), while for low involvement subjects no such effect was present (F = 1.6, p > .2; Ms = 1.58 versus 2.20).

Together, these results provide strong evidence for the success of the involvement manipulation. It should be noted that, within the high involvement condition, subjects exposed to weaker claims reported a somewhat higher level of involvement relative to the strong claims, and also recalled more of the weak claims.

**Claim Strength.** Perceived strength of the ad claims was reported by subjects on seven scales. A 3-way ANOVA on the average of these scales revealed a significant difference (F = 34.3, p < .001) between the strong (M = 1.51) and weak (M = 0.57) versions of the claims. All three 2-way interactions were significant (see Table 3). The claims manipulation had a stronger effect when involvement was higher (F = 30.8, p < .001; Ms = 1.78 versus 0.51 for strong and weak claims respectively) than lower (F = 7.1, p < .01; Ms = 1.24 versus 0.63). Similarly, HK subjects (F = 32.3, p < .001; Ms = 1.56 versus 0.28 for strong and weak claims respectively) were more sensitive to the claims manipulation than novices (F = 6.0, p < .05; Ms = 1.45 versus 0.87). And novices rated the claims more favorably under high than low involvement (Ms = 1.49 versus 0.83; F = 7.6, p < .01) but no such difference was observed for HK subjects (Ms = 0.86 versus 1.03; F < 1). A significant 3-way interaction (F = 3.9, p < .05) was also observed. For
novices, the claims manipulation had about the same effect when involvement was high ($F = 3.1, p < .09$) or low ($F = 4.4, p < .05$). For HK subjects, the effect of claims was stronger under high ($F = 31.5, p < .001$) than low involvement ($F = 3.5, p < .07$).

Further evidence for the claims manipulation was derived from an analysis of the Fishbein multiattribute index computed based on subjects' belief and evaluation ratings for the eight attributes mentioned in the ad. A significant difference ($F = 55.7, p < .001$) was observed between the strong and weak claims conditions ($Ms = 119.2$ and $32.0$ respectively; scale ranges from $-288$ to $+288$). Again, significant 2-way and 3-way interactions indicated a pattern of effects identical to the results based on claim evaluation (see Table 3).

A final check for this manipulation was obtained from two measures that asked subjects to estimate the real price of the advertised alarm system and to indicate how much they would be willing to pay for it. Subjects exposed to the strong claims estimated the average real price at $959.39, while those in the weak claims estimated the price at $560.96. This difference was significant ($F = 21.7, p < .001$). A significant interaction of the claims and knowledge manipulations ($F = 6.2, p < .05$) also emerged. HK subjects estimated a higher price ($F = 26.2, p < .001$) for the strong claims ($\$1020.36$) than weak claims version ($\$407.71$), while novices' price estimate did not vary in response to claim strength ($F = 1.7, p > .1$; $Ms = \$886.48$ versus $\$717.28$). The results for the second measure (amount willing to pay) were identical.
Subjects were willing to pay almost twice as much ($624.74) in the strong claims condition compared to the weak claims ($355.26).

**Prior Product Knowledge:** Prior to the start of the longitudinal knowledge manipulation, subjects responded to two self-report scales of product knowledge. This provided a baseline measure to which we could compare the knowledge level after the induction. On this pre-induction measure, subjects assigned to HK and novice groups reported little knowledge about alarm systems (Ms = −0.91 and −1.05 respectively). The difference between the two groups was insignificant (F < 1). The self-report scales administered after the knowledge induction revealed, however, that while novices reported about the same lack of knowledge (M = −1.43), HK subjects reported a higher level of knowledge (M = 1.24), with the difference between HK subjects and novices being significant (F = 317.4, p < .001). The 10-item objective knowledge exam administered to subjects after the induction also revealed that HK subjects (M = 6.99) outperformed novices (M = 3.49) significantly (F = 188.2, p < .001). The correlation between this measure and subjective knowledge was strong (r = 0.68, p < .001).

A final piece of evidence supporting the success of the knowledge manipulation is derived from the ad recall task. Given HK subjects' relative ease in comprehending and remembering the claims, we expected that they would exhibit a significant edge over novices in claims recall performance. This proved to be true as HK subjects recalled an average of 5.33 claim
elements compared to novices who could only recall 3.34 claim elements (F = 22.2, p < .001). We also regressed ad claims recall on the measures of objective and subjective knowledge separately. The objective knowledge measure was a significant predictor of claim recall (R^2 = 7.1 percent, β = .27, t = 3.9, p < .001). The results using subjective knowledge as a predictor were very similar (R^2 = 8.4 percent, β = .29, t = 4.3, p < .001).

Tests of Hypotheses

**Effect of Knowledge on Amount of Thought – SAs and CAs.** Although we argued earlier that it is impractical to expect a main effect of knowledge on total brand-related thought, we predicted in H1a that the effect of knowledge on counterarguments could materialize in the weak claims condition, where discrepancy between the claims and prior knowledge is more likely.

We analyzed the number of CAs reported via a 3-way ANOVA (see Table 3). The main effect of the claims was significant (F = 19.3, p < .001). Subjects generated an average of 0.67 CAs when the claims were strong and 1.55 CAs in response to the weak claims. The main effect of involvement was also significant (F = 31.1, p < .001). Subjects generated 1.69 CAs under high involvement compared to 0.55 CAs under low involvement. The interactions of claims with knowledge (F = 6.8, p < .01) and of claims with involvement
(F = 5.3, p < .05) were significant, while the interaction of knowledge with involvement was marginally significant (F = 3.5, p < .1).

For the claims X knowledge interaction, we performed simple main effects within each of the claims conditions. While novices generated 1.06 CAs in response to the weak claims, HK subjects reported 2.02 CAs. This difference was significant (F = 11.6, p < .001), supporting H1a. Comparatively, CAs generated in response to the strong claims did not differ between HK subjects (M = 0.55) and novices (M = 0.83; F = 1.5, p > .2). A graph of this interaction is presented in Figure 3a.

Simple main effects tests also confirmed that subjects' CAs exhibited greater sensitivity to the claims under high (F = 22.8, p < .001; Ms = 1.00 versus 2.38 for strong and weak claims respectively) than low involvement (F = 1.8, p < .2, Ms = 0.35 versus 0.75). The knowledge X involvement interaction was of the form that, while both HK subjects and novices increased production of CAs under high involvement, the increase was greater for HK subjects (F = 30.0, p < .001; Ms = 0.49 versus 2.02 for low and high involvement respectively) than novices (F = 5.6, p < .05; Ms = 0.62 versus 1.30).

H6 predicted that the differences due to knowledge would diminish under low involvement. Although the 3-way interaction was not significant, (F < 1), we performed planned contrasts between HK subjects and novices within the weak claims condition, separately for high and low involvement. In the high involvement/weak claims condition, HK subjects (M = 2.93) reported
significantly more CAs than novices ($M = 1.68$; $F = 8.2$, $p < .01$). But for low involvement/weak claims, no such difference emerged ($Ms = 0.96$ versus $0.57$; $F = 1.1$, $p > .3$). The results of these simple main effects tests are consistent with H6.

In contrast to the results for CAs, when SAs were analyzed the only significant effects were due to involvement ($F = 19.3$, $p < .001$) and claims ($F = 9.7$, $p < .01$). Subjects reported more SAs under high ($M = 1.12$) than low involvement ($M = 0.39$), and in the strong ($M = 1.01$) than weak ($M = 0.49$) claims condition. The interaction of claims with knowledge was not significant ($p > .1$), and simple main effects tests confirmed there were no differences due to knowledge in either the strong or weak claims condition ($p's > .2$; see Figure 3b).

Clearly then, while HK subjects did generate more CAs than novices in response to the weak claims, they were not similarly inclined to produce more SAs than novices when processing the strong claims. Put another way, when the claims appeared to be discrepant from prior knowledge, HK subjects did refute them, unlike novices. But when given claims that were consistent with their knowledge, HK subjects generated about the same number of SAs as novices.

Effects on Single-Fact Interpretations and Abstractions. H1b predicted that greater knowledge would facilitate the generation of more SFI's and abstractions, with this effect more likely to appear under high involvement
(H6). A 3-way ANOVA on the number of SFI's (see Table 4 for means and Table 5 for F-values) revealed a marginally significant main effect of knowledge (F = 2.1, p < .08; 1-tailed test), with HK subjects (M = 1.00) generating more SFI's compared to novices (M = 0.73). Significant effects were also observed due to involvement (F = 22.3, p < .001) and claim strength (F = 8.4, p < .01), such that more SFI's were generated under high than low involvement (Ms = 1.31 versus 0.45) and when the claims were weak than strong (Ms = 1.13 versus 0.61). This effect of the claims manipulation adds credence to the position that the weak claims were perceived to be more discrepant from prior knowledge. As evidenced by the 2-way interaction reported below, this caused HK subjects, and not novices, to generate more qualifications to the ad claims.

Two 2-way interactions were significant—that of knowledge with involvement (F = 4.1, p < .05) and knowledge with claims (F = 5.1, p < .05). Simple main effects tests confirmed that HK subjects (M = 1.61) generated more SFI's than novices (M = 0.96) under high involvement (F = 7.8, p < .01) but not under low involvement (HK subjects' M = 0.38, Novices' M = 0.52; F < 1; see Figure 3c). This result supports H1b, and the prediction in H6 that the effect of knowledge on SFI's is diminished under low involvement. Simple main effects tests for the knowledge X claims interaction revealed that HK subjects (M = 1.50) reported more SFI's than novices (M = 0.74) in response to the weak claims (F = 9.0, p < .01), but not when exposed to the strong claims (HK subjects' M = 0.53, Novices' M = 0.72; F < 1; see Figure 3d).
A similar ANOVA was performed on the number of abstractions generated. The only significant main effect was that of involvement \( (F = 39.2, p < .001) \). High involvement subjects reported an average of 1.44 abstractions compared to 0.52 for low involvement. No effect of knowledge was observed \( (F = 1.4, p > .2) \).

As an alternative approach to exploring the effect of knowledge on number of SFI's and abstractions generated, we substituted the knowledge manipulation conditions with measures of objective and subjective knowledge as predictor variables. Regressing SFI's on objective knowledge yielded substantially similar results to the ANOVA reported above. The \( \beta \) was significant \( (p < .05) \) and positive, although the variance explained was small (2.6 percent). The regression with subjective knowledge as the predictor was not significant \( (p > .1) \). When abstractions were employed as the dependent measure, no effects of knowledge \( (p > .4) \) were detected in either regression.

The lack of a significant effect on number of abstractions runs counter to our prediction in H1b. One likely explanation for this may lie in the nature of the knowledge manipulation—while subjects were educated with regard to product terminology, attributes, usage, etc., more emphasis on developing their ability to combine attribute information and form generalizations was probably needed. In its present form, the knowledge manipulation assignments did not call for much of this type of abstracting and generalizing. Even so subjects still generated an average of one abstraction each. While this by itself does not tell us much about subjects’ ability to abstract (we
would need to know how many abstractions would emerge when the ability to do so was definitely present—this would allow a comparison with the reported number of abstractions), it does show that this ability was not completely lacking. Thus, no clear explanation is available for this null result.

**Brand and Ad Thoughts Predicting Brand Attitude.** H2a predicted that, as knowledge increases, brand thoughts should explain more variance in brand attitude, while the influence of ad thoughts should decline (H2b). Further, differences in the predictiveness of ad and brand thoughts as a function of knowledge should be diminished under low involvement, as specified in H6. To test these hypotheses, we regressed brand attitude on valenced (positive – negative) indices of ad and brand thoughts, within each knowledge X involvement cell. Table 8 presents the results of these analyses.

For both novices and HK subjects under high involvement, brand thoughts were the only significant predictor, with 31.7 and 50.0 percent explained variance respectively in brand attitude. The significant β for ad thoughts as a predictor in the HK condition was due to a suppressor effect—the correlation results in Table 9 show no relation between ad thoughts and brand attitude within this condition. Under low involvement, brand thoughts were again significant for HK subjects, but only ad thoughts were able to predict novices’ brand attitude. Variance explained was 17.3 and 33.3 percent for novices and HK subjects respectively.
The regressions within either involvement condition in Table 8 may be generally represented by the following pair of equations:

\[
\begin{align*}
\text{HK subjects:} & \quad Y_1 = \beta_{11}X_1 + \beta_{12}X_2 + \epsilon \\
\text{Novices:} & \quad Y_2 = \beta_{21}X_1 + \beta_{22}X_2 + \epsilon
\end{align*}
\]

where \( X_1 \) and \( X_2 \) represent ad and brand thoughts respectively.

For H2a to be supported, the \( \beta \) coefficient for HK subjects’ brands thoughts should be significantly greater relative to novices (i.e., \( \beta_{12} > \beta_{22} \)); and according to H2b the opposite pattern is expected for ad thoughts (\( \beta_{12} < \beta_{21} \)). To support H6, these differences should not be significant (or at least be alleviated) under low involvement.

To test for differences in the \( \beta \) coefficients, we adopted the following plan of analysis. Within each involvement condition, we pooled HK subjects and novices’ data and represented the difference in knowledge between the two groups by a dummy variable corresponding to each predictor (\( D_1 \) and \( D_2 \)). The equation thus took the form:

\[
Y = \beta_1X_1 + \beta_2X_2 + \beta_3[D_1*X_1] + \beta_4[D_2*X_2] + \epsilon
\]

In this equation, if \( \beta_3 \) was significant it would indicate a significant difference in the \( \beta \)'s associated with \( X_1 \) in equations (1) and (2) above. Similarly, \( \beta_4 \), if significant, would indicate such a change for \( X_2 \).
On estimating equation (3) under high involvement, it was found that while brand thoughts were less predictive for novices than HK subjects ($\beta_4 = .35$, $t = 2.9$, $p < .01$), no difference emerged for ad thoughts ($p > .2$). This latter result was expected given that ad thoughts did not influence brand attitude in either knowledge condition. For low involvement, brand thoughts were still less predictive for novices ($\beta_4 = .29$, $t = 2.0$, $p < .05$), and no difference again was observed for ad thoughts ($p > .2$).

These results indicate that knowledge did moderate the influence of brand thoughts on attitude, and this moderation was not diminished under low involvement. In contrast, ad thoughts remained equally predictive of both HK subjects’ and novices’ brand attitude under low involvement, and played an insignificant role under high involvement. Thus, while H2a was supported, H2b and H6 were not.

In support of H2b, however, it should be noted from the low involvement regression analyses in Table 8 that ad thoughts were only significantly predictive of novices’, and not HK subjects’ brand attitude. In summary, under high involvement, both HK subjects and novices relied on their brand thoughts in forming attitudes, although novices did so to a lesser extent. When involvement was low, novices switched to ad thoughts as a basis for attitude formation, while HK subjects continued to rely on their brand thoughts.
Effects on Valence of Thought. Of interest here is the difference in responsiveness of HK subjects and novices to variations in ad claim strength—and also as a function of involvement. H3a predicted that HK subjects' valenced brand thoughts would exhibit a greater change in response to the claim manipulation, relative to novices. Further, according to H6, this difference would be attenuated under low processing involvement.

We analyzed a valenced index of brand thoughts via a 3-way ANOVA (see Tables 4 and 5 for means and F-values). The main effect of the claims manipulation (F = 27.2, p < .001) was significant, with subjects generating a more negative reaction to the weak (M = -1.06) than strong (M = 0.34) claims. To test H3a, of particular interest here is the interaction between claims and knowledge. This interaction was significant (F = 8.2, p < .01). HK subjects (F = 33.9, p < .001) were sensitive to variation in the claims (Ms = -1.65 versus 0.53 for weak and strong claims respectively) but novices were not (F = 1.8, p < .2; Ms = -0.44 versus 0.11). Therefore, H3a was supported.

The remaining 2-way interactions were also significant: involvement with claims (F = 6.8, p < .01), and involvement with knowledge (F = 4.7, p < .05). Subjects were more sensitive to variation in the claims under high (F = 30.8, p < .001; Ms = -1.64 versus 0.50 for weak and strong claims respectively) than low involvement (F = 3.1, p < .1; Ms = -0.50 versus 0.18). For the involvement X knowledge interaction, simple main effects tests showed that while HK subjects' valenced brand thought was more negative under high (M = -1.04)
than low involvement (M = -0.02; F = 7.5, p < .01), no such difference emerged for novices (Ms = -0.02 versus -0.32; F < 1).

H6 hypothesized that the interaction of claims with knowledge would be weaker or insignificant under low involvement. The 3-way interaction in the above ANOVA did not attain significance (F < 1). We performed planned contrasts between the weak and strong claim conditions separately for HK subjects and novices, and within each level of involvement. Figure 3e and 3f provide a graphical representation of these effects. First, within high involvement, we expected that HK subjects would differ from novices in their responsiveness to the claims manipulation. This proved to be the case, as HK subjects' valenced brand thoughts were significantly (F = 20.4, p < .001) more negative in the weak than strong claims conditions, while novices' thoughts were not (F = 2.0, p > .1; see Table 4 for means). Then, within the low involvement condition, we expected this difference due to knowledge to be attenuated. However, the contrast results revealed that HK subjects continued to differentiate between the strong and weak claims (F = 15.1, p < .001), and novices did not (F < 1). These results indicate that the observed knowledge differences on valenced brand thought were not moderated by involvement, disconfirming H6.

Effects on Brand Attitude. H3b predicted a pattern of results for brand attitude that should parallel that of valenced brand thoughts. In a 3-way ANOVA on brand attitude (see Tables 6 and 7), the claims manipulation
exerted a significant effect ($F = 47.7, p < .001$), with subjects generating a more negative reaction to the weak ($M = -0.02$) than strong ($M = 1.18$) claims. For H3b to be supported requires an interaction between claims and knowledge. This interaction was in fact significant ($F = 10.9, p < .001$). HK subjects ($F = 53.5, p < .001$) were more sensitive to variation in the claims ($Ms = -0.39$ versus $1.37$ for weak and strong claims respectively) than novices ($F = 5.2, p < .05; Ms = 0.36$ versus $0.95$). H3b was thus supported.

The two other 2-way interactions were also significant: involvement with claims ($F = 4.8, p < .05$), and involvement with knowledge ($F = 7.8, p < .01$). Subjects' attitude was more sensitive to variation in the claims under high ($F = 41.5, p < .001; Ms = -0.26$ versus $1.33$ for weak and strong claims respectively) than low involvement ($F = 10.9, p < .001; Ms = 0.22$ versus $1.03$). For the involvement X knowledge interaction, simple main effects tests showed that while HK subjects' brand attitude was more negative under high ($M = 0.22$) than low involvement ($M = 0.84; F = 6.8, p < .01$), novices' attitude became marginally more favorable as involvement increased ($Ms = 0.40$ versus $0.90; F = 3.9, p < .1$).

H6 also hypothesized that the interaction of claims with knowledge would have a weaker or insignificant effect on brand attitude under low involvement. The 3-way interaction in the above ANOVA was significant ($F = 5.8, p < .05$). Figure 3g and 3h provide a graphical representation of these effects. Within high involvement, we expected that HK subjects would differ from novices in their responsiveness to the claims manipulation. This
proved to be the case, as HK subjects' brand attitude was significantly (F = 47.7, p < .001) more negative in the weak than strong claims conditions, while novices' attitude was not (F = 1.7, p > .1; see Table 6 for means). Within the low involvement condition, we expected this difference due to knowledge to be attenuated. The contrast results revealed that HK subjects continued to differentiate between the strong and weak claims (F = 9.3, p < .01), albeit to a lesser extent than under high involvement as evidenced by the 3-way interaction and the magnitude of differences in the means in Table 6. HK subjects' attitude means differed by 2.5 scale points under high involvement, and only by 0.9 scale points under low involvement. Comparatively, for novices, attitude differences between the claims conditions remained virtually constant moving from high to low involvement (0.5 and 0.6 scale points respectively). Interestingly, though, while this difference was not significant under high involvement (as reported above), it was so in the low involvement condition (F = 4.1, p < .05).

These results indicate that, for brand attitude, the observed knowledge differences were moderated by involvement, confirming H6.

**Origin of Thought – Effects on Amount of Thought.** H4a predicted that self-generated thought—i.e., M-M-O and R-G thought—will increase concomitantly with knowledge. No effect of knowledge was predicted for M-O thought. As explained earlier, R-G thoughts were omitted from the analyses
as subjects reported very few such thoughts. Thus, only indices of M-O and M-M-O thoughts were analyzed via 3-way ANOVAS.

For M-M-O thoughts, the main effect of involvement was significant ($F = 50.6$, $p < .001$), with subjects reporting more M-M-O thoughts when involvement was high ($M = 2.61$) than low ($M = 0.92$). Although the main effect of knowledge was not significant ($F < 1$), the 2-way interaction of the knowledge and claim manipulations was ($F = 7.5$, $p < .01$; see Figure 3i). HK subjects ($M = 2.29$) generated more M-M-O thoughts than novices ($M = 1.48$; $F = 5.9$, $p < .05$) when exposed to the weak claims. In the strong claims condition, however, no such difference emerged (novices $M = 1.87$; HK subjects $M = 1.40$; $F = 2.1$, $p > .1$).

Thus, although H4a predicted a main effect of knowledge on M-M-O thoughts, this effect emerged only within the weak claims condition. This result is similar to that obtained in the analysis on single-fact interpretations (Figure 3d). To the extent that both SFI's and M-M-O thoughts represent subjective qualifications of ad claims, this parallel result appears reasonable. Underlying our reasoning for H1a (that knowledge would increase CAs to the weak claims) was the argument that subjects would be more inclined to refute discrepant information than affirm claims consistent with prior knowledge. Just as this occurred, it is logical to expect that HK subjects would also generate more M-M-O thoughts than novices only in response to the weak claims. If this were true, the valence of this increased thought should be negative, since subjects were responding to weak claims. To assess
this, we performed a 3-way ANOVA on valenced M-M-O thoughts (see Tables 6 and 7). Of particular interest here is the interaction between the knowledge and claims manipulations. This interaction was significant ($F = 8.5, p < .01$). Simple main effects tests confirmed that while HK subjects’ M-M-O thoughts ($M = -1.67$) were more negative than for novices ($M = -0.44$) within the weak claims condition ($F = 14.8, p < .001$), there was no such difference in the strong claims condition ($F < 1$; $Ms = 0.38$ versus $0.17$).

H6 predicted that the effect of knowledge on the number of M-M-O thoughts would be diminished under low involvement. To assess if the previously reported effect of knowledge on M-M-O thoughts within the weak claims condition was stronger under high involvement, we performed contrasts between HK subjects’ and novices’ M-M-O thoughts within the weak claims condition, separately for low and high involvement. In the high involvement/weak claims condition, HK subjects did generate more M-M-O thoughts than novices ($F = 2.9, p < .05$, 1-tailed test; see Table 6 for means). In contrast, the difference due to knowledge was insignificant in the low involvement/weak claims condition ($F < 1$). This moderation by involvement level further supports H6.

Finally, turning to M-O thoughts, no effect of knowledge was predicted. A 3-way ANOVA (Table 7) revealed that only the main effect of involvement was marginally significant ($F = 2.9, p < .1$); subjects reported more M-O thoughts under high ($M = 0.26$) than low involvement ($M = 0.09$). No other effects attained significance.
Origin of Thought — Explaining Brand Attitude. H4b predicted that M-M-O and R-G thoughts would better predict brand attitude for HK subjects compared to novices. Further, by H6, this difference in predictive ability should be weaker under low involvement. Since R-G thoughts were insufficient in number, we tested these hypotheses using M-M-O thoughts.

We examined the ability of valenced indices of M-O and M-M-O thoughts to account for variance in HK subjects’ and novices’ brand attitude via regression and correlation analyses. Because ad-related thoughts could potentially also be a predictor, especially for novices, a valenced index of this variable was also included in the regressions. Table 10 presents the regression results.

In the high involvement condition, total variance explained was 56.1 percent for HK subjects and 34.7 percent for novices. As before, due to a suppressor effect the β coefficient for HK subjects’ ad thoughts was significant, despite a non-significant relation of this variable with brand attitude (see correlations in Table 9). For HK subjects and novices, M-M-O thoughts were the most important predictor. M-O thoughts were not significant. For H4b to be supported, the β coefficient for M-M-O thoughts should be significantly greater for HK subjects than novices. To compare the β coefficients across the two equations, we implemented the same approach explained earlier (see section on ad and brand thoughts predicting attitude).
The following equation was estimated using data pooled across HK subjects and novices within the high involvement condition:

\[ Y = \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 [D_1 X_1] + \beta_5 [D_2 X_2] + \beta_6 [D_3 X_3] + \epsilon \]

In this equation, \( X_1 \) and \( X_3 \) represent ad thoughts, M-O and M-M-O thoughts respectively. Correspondingly, if \( \beta_4, \beta_5, \) and \( \beta_6 \) were significant, that would indicate a difference in the predictiveness of \( X_1, X_2 \) and \( X_3 \) across the knowledge conditions. The regression results showed that while \( \beta_6 \) was significant (\( \beta_6 = .32, t = 2.4, p < .05 \)), \( \beta_4 \) and \( \beta_5 \) were not (\( p > .2 \)). This indicates that the increased explanatory power for HK subjects' brand attitude can be attributed to M-M-O thoughts, supporting H4b. Correlational analyses (see Table 11) also show that M-M-O thoughts were more strongly related to HK subjects' than novices' brand attitude.

Turning to the low involvement condition, the regression results in Table 10 indicate that while explained variance in HK subjects' brand attitude was 32.9 percent, it dropped to 17.6 percent for novices. While M-M-O thoughts were a significant predictor for HK subjects, ad thoughts were marginally significant. On the other hand, for novices ad thoughts were the only significant predictor. Since no M-O thoughts were generated by subjects under low involvement, the following equation was estimated on data pooled across knowledge conditions:
\[ Y = \beta_1 X_1 + \beta_2 X_2 + \beta_3[D_1 \times X_1] + \beta_4[D_2 \times X_2] + \epsilon \] (3)

where \( X_1 \) and \( X_2 \) represent ad and M-M-O thoughts respectively.

The results from this analysis revealed that while \( \beta_4 \) was marginally significant (\( \beta_4 = .32, t = 1.9, p < .07 \)), \( \beta_3 \) was not (\( p > .2 \)). This indicates that while a marginal difference was observed in the predictiveness of M-M-O thoughts across knowledge conditions, this wasn't the case for ad thoughts. When compared to the high involvement results reported above, these numbers show that low involvement did diminish the change in influence of M-M-O thoughts on HK subjects versus novices' brand attitude, supporting H6.

**Origin of Thought and Confidence in Brand Evaluation.** We expected that HK subjects would report more confidence in their brand evaluation than novices (H5). A 3-way ANOVA on the confidence measure revealed, however, that the effect of knowledge was insignificant (\( F = 1.3, p > .2 \)). Both HK subjects (\( M = 5.70; \) scale ranges from 1 to 7) and novices (\( M = 5.89 \)) reported an equally high level of confidence. Only the main effect of involvement was significant (\( F = 4.5, p < .05 \)), with subjects reporting somewhat greater confidence under high involvement (\( Ms = 5.97 \) versus 5.62).

In retrospect, rather than assessing subjects' confidence in their rating of the advertised brand, it may have been more appropriate to measure their
confidence in their ability to evaluate burglar alarm systems. The latter approach should more accurately tap differences in confidence attributable to the knowledge manipulation. The scales used here merely asked subjects to indicate certainty with respect to their previous response on the brand evaluation measure.

From an origin of thought perspective, we would expect that confidence would be important in determining the relation between M-M-O thoughts and brand attitude. Without the knowledge to understand and use brand attribute information, as well as subsequently not being able to evaluate the merits of the brand, one would be less likely to rely on self-generated thought in forming brand attitudes.

Since no difference due to knowledge was obtained on the confidence measure, we adopted the following alternate approach to studying whether differences in confidence may account for variation in the ability of M-M-O thoughts to predict brand attitude. To assess the effects, if any, of confidence, we first split the sample into low and high confidence groups (within each level of the knowledge manipulation) based on the self-report confidence measure. For the HK group, this resulted in 69 and 37 subjects in the low (M = 5.06) and high (M = 6.91) confidence groups respectively, while the novice group was split into 61 low confidence (M = 5.30) and 35 high confidence (M = 6.91) novices. Means for the confidence subgroups within each level of knowledge were significantly different from each other (p < .001).
We then regressed brand attitude on M-M-O thoughts within each level of confidence, separately for HK subjects and novices. Table 12 presents the results of the regression analyses. In the novice group, explained variance increased from 14.7 in the low confidence subgroup to 24.4 percent in the high confidence subgroup. For HK subjects, confidence enhanced the extent of explained variance from 34.0 to 52.4 percent.

If a confidence-based mechanism were to influence the explanatory power of self-generated thought, then we should find M-M-O thoughts to be a stronger predictor for the high confidence group, especially for HK subjects. To test this hypothesis, we undertook a test of differences in the $\beta$ coefficients by pooling the data across the confidence subgroups (but within each knowledge condition), and estimating the following equation:

$$Y = \beta_1 X_1 + \beta_2 [D_1 * X_1] + \epsilon$$

where $Y$ and $X_1$ represent brand attitude and M-M-O thoughts respectively, and $D_1$ is a dummy variable representing the difference due to the knowledge manipulation between subjects.

A significant $\beta_2$ coefficient would indicate that $\beta_1$ differs across the confidence subgroups. We estimated this equation separately for the novice and HK groups. For novices, $\beta_2$ was not significant ($p > .2$), indicating that an increase in confidence did not enhance their reliance on M-M-O thoughts. On the other hand, HK subjects did benefit from the increased confidence—as evidenced by the significant coefficient ($\beta_2 = .22, t = 2.1, p < .05$). With
greater confidence, HK subjects were more likely to rely on their M-M-O thoughts for forming brand evaluations. These results support the ability of confidence to moderate the relationship between M-M-O thoughts and brand attitude for HK subjects.

Knowledge, Product Involvement, and Processing Motivation. In H7a and 7b it was proposed that knowledge would increase product involvement, which in turn would raise motivation to process. We also predicted that knowledge was unlikely to directly affect processing involvement, and any observed relation between these two variables could be accounted for by product involvement.

We examined the relationship between knowledge and product involvement, and the consequent effects on processing involvement, by estimating a series of Lisrel models (see Figure 4). Model A hypothesizes an effect of the knowledge manipulation on product involvement, which in turn affects processing involvement. H7a would be supported if this model fits the data, and all path estimates are significant. Model B adds a direct path from knowledge to processing involvement. If our prediction in H7b about the mediating role of product involvement is correct, this path should be insignificant.

In Models C and D, we switched knowledge and product involvement; these two models are otherwise similar to A and B. Comparing the results for Models A & B with C & D allows us to determine which of the bi-directional
causal relationships between knowledge and product involvement is supported by the data. Specifically, if knowledge were to influence product involvement, and not vice versa, then Models A & B are appropriate. If product involvement were to affect knowledge, and not vice versa, Models C & D are appropriate. Note that in this study, given the manipulation of product knowledge, we expect an effect of knowledge on product involvement (Models A & B), rather than the other way around.

Finally, Model E represents an alternative approach to studying the issue—the bi-directional relationship between knowledge and product involvement is represented within one model, and the paths leading to processing involvement provide an indication as to which of its antecedents are influential. To support our predictions in H7a and b, the path from knowledge to processing involvement should be insignificant, with all other path estimates expected to be significant.¹⁰

¹⁰ One concern in testing these relationships was the significant effect of the involvement manipulation on the product involvement measure (F = 4.6, p < .05). Remember that product involvement was assessed along with the other dependent measures after the involvement induction. This effect was not a complete surprise, given that the scales in Zaichkowsky's (1985) product involvement measure are similar to the type of scales one would use to tap processing involvement. And since subjects were not told to differentiate their enduring involvement from situational involvement (they probably can't even if asked to), it is likely that some effect of the involvement manipulation would appear in the product involvement measure.

The methodological implication of this for testing the relationships modeled in Figure 4 is as follows. Since the involvement manipulation affected both the product and processing involvement measures, any observed relationship between these two measures might well be due to the involvement manipulation. To avoid this possibility, we removed the effect of the involvement manipulation on product involvement via regression analyses, and then re-estimated the relationships
Lisrel maximum likelihood estimates for all five models are presented in Table 13. For Models A and B, the chi-square statistics, GFI and RMSR all indicate an acceptable fit. For both models, the largest parameter estimate was for the effect of product involvement on processing involvement. The effect of knowledge on product involvement was also significant. This significant relationship between the three variables confirms H7a. To test H7b, we need to examine whether the data supports the addition of a direct path from knowledge to product involvement. In Model B, the path estimate for this effect was not significant, and close to zero. A chi-square difference test to assess the increased explanatory power of Model B relative to A revealed no difference between the models ($\chi^2 (1) = 2.3, p > .1$). Thus H7b was also confirmed.

No effect of product involvement on knowledge (as depicted in Models C & D) was predicted in this study. For Model C, consistent with expectations, the results indicated a poor fit. The significant chi-square, accompanied by a poor GFI and high RMSR all indicate that the model is a poor representation of relationships in the data. Comparatively, when the direct path from product involvement to processing involvement is added (Model D), all three goodness-of-fit indicators suggest an acceptable fit. The chi-square difference between product and processing involvement. The correlation between these two measures was 0.45 before removing the effect of the involvement manipulation, and 0.37 after. This slight decrease did not affect the Lisrel estimates, as there was no noticeable change in either overall fit or individual path estimates. As a result, the substantive conclusions drawn from the results remained the same. Therefore, the results presented here are not adjusted for the effect of the involvement manipulation on product involvement.
test indicated a vastly superior fit for Model D over C ($\chi^2_d (1) = 32.4$, $p < .001$). These results indicate that modeling the direct effect of product involvement on processing involvement (rather than through product knowledge) is crucial to capturing data relationships. Further, since Models A, B, and D perform equally well in representing data relationships, A is the preferred model based on parsimony.

Turning to Model E, the goodness-of-fit indicators reveal an acceptable fit. The path from product involvement to processing involvement, and the correlation between knowledge and product involvement were significant, again confirming H7a. In support of H7b, processing involvement was influenced only by product involvement, and not by knowledge. These results are also completely consistent with Model A.

To summarize, Model A provides the best representation of data relationships in this study. Only a uni-directional effect of knowledge on product involvement was expected, and supported. On a more general theoretical level, these results can be subsumed into the bi-directional relationship between knowledge and product involvement, as represented in Model E (minus the path from knowledge to processing involvement).
CHAPTER V
DISCUSSION

Figure 5 presents a summary of findings for each hypothesis. In this chapter, we first consider the observed effects of knowledge on thought processes and brand attitude formation. Then, we review the findings with regard to knowledge and product involvement. This is followed by an assessment of the contributions and limitations of this study.

Knowledge and Advertisement Processing

Effects on Amount and Type of Thought. Given the limitations of paper-and-pencil measures of cognitive response, it was argued that predicting differences in the amount of aggregate brand thought was not feasible. Rather, it would be more useful to examine qualitative differences in the types of thoughts generated by HK subjects and novices, and anticipate knowledge effects on specific types of brand thought. Since HK subjects were expected to use their superior knowledge to engage in greater elaboration of the message, it was argued that more elaborative thinking (i.e., SFI's and abstractions) would occur for HK subjects than novices. Secondarily, we had proposed that, if the weak claims message was perceived as discrepant from prior product knowledge, then HK subjects’ counterargumentation would
surpass that of novices within this condition. This, in fact, proved to be the case.

When brand thought was disaggregated based on level of abstraction, it was found that knowledge had an impact on only one of two levels of abstraction analyzed. The number of SFI's was sensitive to variations in prior knowledge. This result demonstrates that HK subjects were able to use their knowledge to interpret the ad claims and evaluate individual attributes. Consistent with the result that increasing in counterargumentation due to knowledge occurred only for the weak claims (with no corresponding effect for support arguments in the strong claims condition), the influence of knowledge on SFI's was more pronounced in the weak claims condition.

Contrary to the effects obtained for SFI's, knowledge did not alter the number of abstractions generated. Chattopadhyay and Alba (1988) defined abstractions as thoughts that summarize or generalize specific attributes. As such, we expected such processing should be facilitated by prior knowledge, as one's ability to meaningfully interpret and combine attribute information should be enhanced by the skills related to comprehension and elaboration.

Two other studies that have attempted to classify cognitive responses based on abstraction are by Sujan (1985) and Maheswaran and Sternthal (1990). Sujan proposed a somewhat different classification which does not quite parallel the coding scheme used by Chattopadhyay and Alba (1988) and in this study. What are referred to here as SFI's and abstractions appear to most closely match one of Sujan's categories termed as attribute-oriented
thought. Sujan found that HK subjects did generate more attribute-oriented thoughts than novices. Similarly, Maheswaran and Sternthal (1990) classified thoughts based on Sujan's coding scheme, and found that HK subjects' processing was characterized by more attribute-oriented thought. However, in both of these studies, since SFI's and abstractions were combined into one category, it cannot be determined whether only one of the two types of thought was responsible for this effect.

As noted earlier, an alternative explanation for the lack of an effect on abstractions relates to the nature of the knowledge manipulation. If the knowledge induction did not enhance subjects' ability to abstract attribute information, that would cause the observed null effect.

In differentiating between brand thoughts based on level of abstraction, Chattopadhyay and Alba (1988) were interested in studying whether level of abstraction was positively related to the influence of these thoughts on brand attitude, especially over time. They surmised that the temporal stability of thoughts increased with level of abstraction, and thus increased the influence of abstract thoughts on brand evaluations. Their findings supported such a relationship. Our findings, along with Sujan (1985), supplement this explanation by indicating that one antecedent of level of abstraction is prior knowledge. HK subjects, who were more likely to generate SFI's, exhibited a stronger thought-attitude relationship.

An alternative explanation for the stronger relationship between abstract thoughts and attitude is also plausible. According to the ELM (Petty and
Cacioppo 1986), attitudes based on a reasoned consideration of message arguments are more enduring over time. As demonstrated in this study, HK subjects were more likely than novices to thoroughly evaluate the ad claims and base their brand evaluation on the same. Thus, their attitude should endure better over time, and may account for the stronger relation of abstract brand thoughts with delayed brand attitude reported by Chattopadhyay and Alba (1988).

**Ad and Brand Thoughts Mediating Brand Attitude.** Ever since ad attitude has been recognized to play a role in attitude formation (Mitchell and Olson 1981; Shimp 1981), several studies have examined the relationship of ad thoughts and ad attitude with brand attitude, and the role of factors such as involvement that moderate this relationship (e.g., Gardner 1985a; MacKenzie, Lutz and Belch 1986). In this regard, no study until now has identified consumer knowledge as a moderating variable.

Not unlike involvement, knowledge was predicted to enhance the role of brand thoughts in attitude formation, and reduce the influence of ad thoughts. Given sufficient motivation to activate available knowledge, we proposed that HK subjects were more likely to base their brand evaluations on a careful consideration of the ad claims, while novices were expected to rely on peripheral cues for their evaluation. The results indicate that knowledge did moderate the extent to which ad and brand thoughts served as the basis for brand evaluations.
In our study, while brand thoughts were influential for HK subjects regardless of involvement, they only influenced novices' brand attitude under high involvement. For HK subjects, the pattern of effects appears on the surface to be inconsistent with the general finding in the literature that brand thoughts do not play an important role under low involvement (e.g., MacKenzie et al. 1986). It may, however, be explained through the effect of knowledge on product involvement, and consequently on processing motivation. We found that, within the low involvement condition, involvement with the ad was significantly enhanced for HK subjects relative to novices. Thus, even in the low involvement condition, HK subjects were motivated to some extent to process the ad like high involvement subjects, and hence use their brand thoughts in forming attitudes. In contrast to the effect of brand thoughts, ad thoughts were more influential under low involvement. In fact, for novices, ad thoughts were the only significant predictor under low involvement.

**Susceptibility to Persuasion as a Function of Knowledge.** A crucial question in persuasion research has always been “what can be done to make consumers’ attitude toward my product more favorable?” To this end, advertisers have consistently attempted to make ads more “effective” by increasing the persuasiveness of claims presented and/or using the most influential peripheral cues. Along these lines, ad claims sometimes become outlandish as they proclaim the power of the product to do anything under
the sun, and consumers wonder what a sexy model has to do with buying a hammer at Roscoe's Hardware Store.

As advocated by persuasion models such as the ELM, advertising techniques that work well in one situation may be quite ineffective in another. A common example is when the effectiveness of arguments and peripheral cues depend on the level of one's involvement with the message. Like involvement, we show in this study that knowledge also can enhance sensitivity to the ad claims, and, by dint of increasing the ability to comprehend and elaborate on the message, HK subjects are persuaded more than novices when exposed to strong arguments, and they are more likely to reject weak arguments.

For many commonly purchased products, consumers do not exhibit an inclination to engage in extensive decision-making. This occurs for good reason—often, the cost of additional effort outweighs the perceived benefit. In such situations, when consumers are not "involved" in the purchasing process, efforts at persuasion by communicating strong arguments are less likely to be successful. However, as shown in this study, it is useful to considering differences in knowledge within the target market. Knowledge typically co-occurs with product involvement, and this can enhance effort to process an ad. In such situations, higher knowledge consumers are likely to differ from novices in their response to advertising, even when other situation-based antecedents of processing involvement (e.g., an upcoming choice task) are absent. And in high involvement situations, such differences
are likely to be more pronounced as consumers differ in the amount of knowledge they bring to bear on the decision process. In such situations, tailoring a message to the knowledge of the target market can significantly enhance the efficiency and effectiveness of the communication effort.

**Origin of Thought, Consumer Confidence, & Brand Evaluation.** Based on the theoretical distinction between message-originated, modified message-originated, and recipient-generated thoughts, we anticipated that knowledge would enhance the number of thoughts in the latter two categories and their influence on brand attitude formation. We found that knowledge did indeed increase the number of M-M-O thoughts reported. The category of R-G thoughts was devoid of sufficient data to permit analyses, as explained earlier. When the influence of M-M-O thoughts on brand attitude was estimated, the pattern of effects varied as predicted. Overall, M-M-O thoughts were more predictive of HK subjects' than novices' brand attitude. This effect was also qualified by involvement as expected.

Despite the lack of a knowledge effect on confidence, we were able to demonstrate that confidence in itself can moderate the influence of M-M-O thoughts on brand evaluations. Substantial improvement was observed in the ability of M-M-O thoughts to account for variance in brand attitude for HK subjects. Relatively, confidence did not increase the likelihood of novices relying on their M-M-O thoughts, indicating they could not overcome an ability limitation.
**Ad Claim Discrepancy and Claim Quality Manipulations.** A consistent thread in our findings of effects on amount of thought was the greater influence of knowledge within the weak claims condition. Whether the dependent measure was support/counterarguments, SFI’s, or M-M-O thoughts, knowledge typically had a greater effect within the weak claims condition. We explained this effect through the difference in discrepancy with prior knowledge of the weak versus strong claims. When subjects encounter information that refutes or is simply inconsistent with their existing knowledge, they appear more inclined to react than in cases when such information is found to be agreeable. If discrepancy was indeed the operating factor, then these results are consistent with Sujan’s (1985) finding that HK subjects generated more product thoughts than novices only in the mismatch (discrepant) condition.

**Product Knowledge and Involvement**

**Knowledge X Involvement Interactions.** In line with the ELM’s postulate that both ability and motivation to process are prerequisites for elaboration, we predicted that many of the effects due to knowledge studied here would be qualified by the level of processing involvement. The results for amount of thought indicate that the observed effect of knowledge on counterarguments and SFI’s was only evident under high involvement, as was the effect on modified-message originated thoughts.
Although knowledge did moderate the role of ad and brand thoughts as mediators of brand attitude formation, the effect for brand thoughts did not diminish under low involvement for HK subjects. Our basis for this prediction was that low involvement would limit the activation of prior knowledge. As observed earlier, however, differences in self-reported involvement between HK subjects and novices in the low involvement condition may account for the sustenance of this effect. An alternative reason may be that obtaining effects of knowledge may not entirely depend on reaching a critically high level of involvement; HK subjects may possess innate advantages with regard to processing ability that carry over situations differing in processing motivation.

With regard to susceptibility to persuasion, we did find that the difference between HK subjects’ and novices’ brand attitude was attenuated under low involvement. Although the claims manipulation did have an impact on HK subjects’ attitude under low involvement, the effect was far smaller than that obtained under high involvement, and may again be indicative of the self-induced processing motivation stemming from the effect of knowledge on product involvement. For novices the induction of high motivation resulted in a small and marginally significant effect of the claims on brand thoughts, and no observed effect for brand attitude.

The ability of valenced M-M-O thoughts to explain HK subjects’ and novices’ brand attitude was also moderated by involvement. These results
provide further support for the important role of involvement in moderating persuasion effects.

Effects on Processing Involvement. It was shown that the effects of knowledge on processing involvement operated through product involvement. Further, in this particular study, the data support a causal relation from knowledge to product involvement, and not vice versa. Although the reverse effect is theoretically feasible, the fact that it did not emerge in our study is consistent with the research design, in that we manipulated knowledge and not product involvement. This manipulation also allows us to conclude that knowledge does not directly influence processing involvement.

Celsi and Olson (1988) proposed a model that suggests two antecedents of processing motivation (which they term as felt involvement). The first antecedent is Individual Sources of Personal Relevance (ISPR) while the second is referred to as Situational Sources of Personal Relevance (SSPR). The former stems from an individual's enduring interest in the product category (i.e., product involvement), and the latter is based on situation-based sources of involvement, such as when the consumer is faced with an immediate choice task.

In a study Celsi and Olson conducted, they found that ISPR was a dominant source of influence on felt involvement relative to SSPR. While ISPR accounted for 41 percent of variance in felt involvement, SSPR only explained 2 percent. One should be cautious against generalizing the relative
influence of ISPR and SSPR though, because the relative effect may be
dependent in large part on the power of the manipulations used to induce the
effects. Compared to Celsi and Olson's results, we found that, while both
ISPR (product involvement in our study) and SSPR (the involvement
manipulation) were significant predictors of processing involvement, they
were more equal in their relative influence (ISPR: $\beta = 0.38$, $t = 6.9$, $p < .001$;
SSPR: $\beta = 0.47$, $t = 8.5$, $p < .001$). While ISPR explained 20.1 percent of the
variance in processing involvement, SSPR accounted for 27.6 percent. Again,
the difference between these sets of results may imply that the involvement
manipulation exerted a greater effect in our study, rather than be due to any
theoretical difference.

An interesting qualification to Celsi and Olson's findings was reported in
our study. The knowledge manipulation, as an antecedent of ISPR (product
involvement), exerted a significant effect on processing involvement only
within the low involvement condition. This indicates that the effect of ISPR
was evident only within the low involvement condition, or when SSPR was
low. Thus, when SSPR is high, the incremental effects of ISPR are not
apparent (perhaps due to a ceiling effect), whereas ISPR does "kick in" when
externally-induced motivation is absent.

**Assessing the Knowledge Manipulation**

A significant feature of our study was the procedure developed to
experimentally manipulate product knowledge. Past research has relied on
existing differences in prior knowledge, which can never be completely unconfounded with differences in other factors. In this study, we were able to create two groups of subjects that knew either next to nothing about the product category or were relatively sophisticated consumers in regard to evaluating brands within that category.

Given the nature of the knowledge development process in natural environments, and how little we know about this process, this is probably one of the most difficult factors to manipulate in an experimental setting. To simulate the rich and varied product-related experiences that one accumulates over time, to simulate the information gained from those experiences, and to create a usable knowledge database in the minds of subjects for most of whom learning about the product category is hardly at the top of their list of priorities, is a daunting task. As such, much can be learned from this initial effort, both in terms of how the manipulation can be improved and its limitations for representing knowledge differences outside of the laboratory.

Although most of the results indicate that the manipulation was successful in creating knowledge differences between the HK and novice groups, one unexpected result points to at least one area for improvement. Specifically, HK subjects did not differ from novices in the number of abstractions generated. These thoughts are presumed to represent the higher levels of processing that characterize strong expertise, and the knowledge manipulation as presently configured did not place much
emphasis on developing the ability to abstract information in the HK group. In addition to exercises that train subjects to combine and manipulate attribute information, it may also be useful to include tasks that involve real-world shopping and usage experiences, that would perhaps fill in the gaps due to purely learning-based tasks. The downside of this would be making a logistically difficult manipulation even more so, and a loss of experimental control over what subjects actually learned, resulting in increased within-subject variability.

An alternative approach would be to segment the manipulation to extract those parts that create expertise of the type most relevant to issues within the individual study. One could then pay attention to developing a more comprehensive manipulation of those types of expertise, without making the logistics of the manipulation insurmountable. Obviously, this is only possible to the extent that different types of expertise are responsible for different product-related tasks, and one must also guard against the danger of ignoring possible interactive effects of various dimensions of expertise.

Finally, since the success of the knowledge manipulation was only measured with respect to effects relevant to advertisement processing, it may be necessary to evaluate its appropriateness before adopting it for studying knowledge effects on other consumer behaviors, such as external search for product information.
Contributions of this Study

This research increased our understanding of the effect of knowledge on the thought processes underlying response to advertising. Depending on the level of prior knowledge, subjects reacted differently in both the types of thoughts reported and subsequent effects on attitude formation. It was shown that knowledgeable consumers differ from novices not only in the amount of brand-related thought but also the type of such thought in terms of level of abstraction and origin. Higher knowledge consumers generated more abstract and original thoughts that were in turn more influential in forming brand attitudes. Also, differences due to knowledge in susceptibility to ad claims was tracked both at the process level and for attitudes.

In this study we argued for the need to move beyond simple and aggregate measures of amount of thought as indicators of thinking about the brand, as these measures mask more subtle differences, such as those observed here due to knowledge. The role of confidence was established in explaining differences between subjects in thought-attitude relationships. For higher knowledge subjects, increased confidence did enhance reliance on brand thoughts in forming attitude, but for novices confidence had no effect.

Involvement was shown to play an important role in moderating the effects of knowledge, providing further support for the ELM. Finally, we extend Celsi and Olson’s (1988) findings about the effect of ISPR and SSPR on processing involvement. It was shown that knowledge enhances ISPR, and consequently operates on processing involvement. Further the influence
of ISPR and SSPR was qualified in that ISPR contributed to processing involvement only in the absence of SSPR.

Limitations

The uniqueness of the knowledge manipulation raises important issues with regard to generalizability of the results. To the extent that knowledge was created artificially in a contrived consumer setting, further investigation into the effects of such an approach on the theoretical phenomena of interest is necessary. Also, as noted before, the knowledge manipulation did not increase HK subjects' ability to abstract ad information. The adoption of procedures that train subjects to form abstractions would be useful in further exploring the role of knowledge during higher levels of processing.

The test advertisements designed for this study included claims with respect to every salient attribute of alarm systems. The inclusion of only a subset of such attributes in the ad will instead allow an assessment of HK subjects' ability to access and use additional product information during ad processing. This would permit a more thorough examination of the role of receiver-generated thoughts in ad processing and product judgements.

The use of confidence measures is an issue that deserves more careful study. A more explicit consideration is needed to establish the relation between any particular measure and the type of confidence that is tapped by that measure. Further, including a peripheral cue manipulation in the experimental design would have helped establish the absence/presence of the
peripheral route to persuasion—this would have helped establish the role of knowledge in moderating the operation of the peripheral route.

We also used only print advertisements to test hypotheses in this study. Combined with the fact that subjects did not face a time constraint in processing the ad, this implies that novices might have been able to compensate for their relative handicap by spending more time looking at the ad. This is not possible during exposure to radio or television ads whose pace is media-controlled. It is possible, then, that the benefits of knowledge may be compounded in these processing situations.

Future Research Issues

The effects of knowledge examined in this study represent only a miniscule component of its potential influence on consumer behavior. Several phenomena that have previously been studied in the literature are likely subject to the level of consumers' prior product knowledge. For example, research on decision strategies and memory could benefit from an increased consideration of consumers' knowledge levels. One might examine how the use of various brand-based and attribute-based choice strategies is moderated by knowledge. Or how does knowledge interact with the effect of information-presentation format on evaluation and choice tasks?

More specifically along these lines, future research on knowledge and information processing could focus on issues such as the extent of analytic processing. Alba and Hutchinson (1987) define analytic processing along two
dimensions—amount of search beyond the most accessible information, and the discounting of irrelevant information. One approach to examining the effect of knowledge on the latter dimension would be to expose HK subjects and novices to an ad whose claims pertained to both important and unimportant attributes. By varying the strength of the two types of claims, it should be possible to assess differential aspects of HK subjects' and novices' use of the ad information.

Another study could examine the role of knowledge in attitude susceptibility to different types of peripheral cues. For example, would HK consumers and novices respond similarly to the persuasive intent of an expert source versus an attractive picture that conveys no information relevant to a product's true merits? Under low involvement, it may be expected that novices are more persuaded by an attractive picture than by an expert source, given their limited ability and motivation to comprehend product information conveyed by the expert source. HK consumers in a condition of low motivation may, however, find the expert source to be of greater interest given their prior knowledge about the product category. In contrast, under high involvement we would predict that novices would tend to rely more heavily on the expert source than the attractive picture, as they would attempt to compensate for their limited comprehension and elaboration by using source expertise as a proxy for evaluating the brand's merits. Comparatively, HK consumers would use their high ability and motivation to
generate a reasoned evaluation of the brand without regard to source expertise or the attractiveness of the picture.

Further development of the knowledge manipulation, while proceeding in accord with improvement in the conceptualization of knowledge, should also consider the use of more diverse approaches to validating differences in knowledge. Indicators of knowledge such as the extent of category formation, the degree of refinement of categories, and the ability to discriminate between categories may be used to generate greater confidence in the extent of differences between knowledge groups. Further, it would be useful to consider knowledge outside of the product knowledge domain—such as advertising knowledge. It would also be interesting to study the development of knowledge related to hedonic consumption, and how this might differ from knowledge about utilitarian attributes. This line of research may be extended to that on affective response, and hypotheses about the effect of different knowledge domains on such responses may be developed and tested.

Conclusion

Consumers' prior product knowledge was shown to not only affect the amount and type of thought, but also to determine the favorability of subsequent product judgments. Many of these effects of knowledge were shown to be moderated by the level of processing involvement. Importantly, the moderating role of involvement in persuasion processes was also shown to depend on consumers' prior knowledge, consistent with the ELM. Also
developed in this study was a procedure to manipulate the knowledge construct—such an approach permitted clearer inferences of causal relationships between knowledge and relevant dependent measures. Future research should be able to use this procedure to clarify and extend our understanding of the role of knowledge in the persuasion process.
LIST OF REFERENCES


APPENDIX A

KNOWLEDGE MANIPULATION HANDOUTS
(BURGLAR ALARM SYSTEMS)

105
NOTE: This handout is only for students for whom the last digit of their Social Security # is an even number (0, 2, 4, 6, 8).

THE RESEARCH IN EDUCATION PROGRAM

at

THE OHIO STATE UNIVERSITY

Handout #1
Thank you for agreeing to participate in this research program. This note will briefly explain the purpose of this research, what we expect of you, and how your performance will be evaluated.

To put it simply, this research will examine how students learn information. In order for educators to develop more sophisticated methods of teaching, it is necessary to understand how students encode, learn, and remember information. This research seeks to contribute to our knowledge by providing a better understanding of this process.

In the course of this quarter, we will provide you with information about a product that you presently may know little about. We expect you to learn this information, and complete a series of 5 homework assignments that will provide us with an accurate indication of your learning. Toward the end of the quarter, you will be tested again to assess your learning of the product information.

Don't be afraid! The amount of information you will be asked to learn is not large. Neither is it very complicated. Rather than overload you with information, we are interested in knowing how well you can learn this information. Therefore, we request that you put in your BEST effort. Spend as much time as you need, and if you do not understand anything, feel free to see the contact person listed on the next page.

To be able to generalize our findings, we have decided to use two products. However, to avoid an overload of information, no student will receive information on more than one product. Therefore, half of the students will learn about one product - home burglar alarm systems - while the rest will learn about video cameras.

To comply with research design principles, we will randomly assign students to one product or the other. Students for whom the last digit of their SS# is an even number (0,2,4,6,8) will learn about home burglar alarm systems. Students for whom the last digit of their SS# is an odd number (1,3,5,7,9) will learn about video cameras. After you are assigned to one product, you will receive information only about that particular product for the rest of the quarter.

To encourage you to put in your best effort, your performance will be rewarded through extra credit points that will be added to your exam grades. Each homework assignment you complete is worth 5 points. You can therefore earn a total of 25 points for the five assignments. However, in order to receive credit for any homework assignment, you have to complete all five. Thus, if you complete only three or four assignments, you will not receive any points. Only if you complete all five will you receive the extra credit points.

When we test you again later to assess your learning of the product information, you will have an opportunity to earn up to an additional 15 points. The points you earn will depend on how well you perform on an "exam" that will be administered in class. This exam will test your retention of the product information. However, the same condition applies as before - in order to earn any points you have to complete all five assignments and take the "exam."
To assure the success of this research study, we are very interested in helping you do your best to learn the product information and fully participate in this research. Your homework assignments should reflect only your own effort. Please do not share your work with anybody else. All homework assignments will be checked for evidence of copying. If such evidence is found, you will forfeit all of your extra credit points, and may also be prosecuted for academic misconduct.

Please remember that by not doing your own work, you will destroy the validity of this research. We request that you be very careful in following all of the instructions contained in this and subsequent handouts. We thank you for your cooperation, and look forward to working with you.

CONTACT PERSON: If you have any questions about any aspect of this research, please see Sunil Bhatla in 26 Hagerty Hall, or call him at 292-2959. If there is no answer, you may call 848-8656 and leave a message.

NOTE: PLEASE RETAIN THESE INSTRUCTIONS FOR THE DURATION OF THE QUARTER

In the rest of this handout you will find:

A. Information packet #1 for the product you have been assigned.

B. Homework assignment #1. This assignment is due on Monday, January 23 at the beginning of class.
When Marc and Jan Gibson returned from vacation to their north Chicago neighborhood, they found an empty lot where their house had stood. Posing as city workers, thieves had uprooted the two-story dwelling and hoisted it onto a giant trailer. The couple's belongings, their pets, and even their above-ground pool had all vanished!

Obviously, not everyone suffers such a devastating loss, but home burglaries are becoming commonplace in our society. Based on FBI statistics, there is a one in three chance that your home will be burglarized this year. In addition to learning the information about home burglar alarm systems for the purposes of this research program, we hope that it will prove useful if you plan to purchase such an alarm system in the future.

When professionals talk about burglar alarm systems, they sometimes use words that average consumers may not understand. This handout will focus on some basic terms that we would like you to understand and memorize. This will also help you understand the material that we will provide you in subsequent weeks. If any of the terms and descriptions do not seem clear, please see the contact person listed earlier.

Burglar alarm systems have three main components - the sensors, the control unit, and the alert mechanism.

**Sensors:** Many burglar alarm systems use small devices that can "hear" noises or detect movement around them. There are two basic types of sensors. **Perimeter sensors** detect unauthorized entry through doors, windows and other points of entry to your property, such as fences. These include: magnetic contact sensors, which detect when windows or doors are opened; and electronic sensors that detect when window glass is broken. **Interior sensors** detect a burglar's presence inside your home through the use of microwave, ultrasonic and infrared technology. Microwave and ultrasonic sensors detect movement through the distortion of high frequency sound waves; infrared sensors detect body heat.

Sensors can be mistakenly activated by something other than an intruder, such as human error, thunder, or high winds. Also, children or pets might carelessly trigger sensors. When this happens, your alarm system thinks an intruder has entered, and triggers the alarm or calls the police! This is called a **False Alarm.** Obviously, this is a problem that you can do without!

One approach to minimizing this problem uses sensors that work in concert with each other. **Dual sensors** combine two different sensor technologies into one small device, and both must agree that an intruder is present before the alarm sounds. Thus, if such a sensor could detect both body heat and noise, then a false alarm would not be triggered by thunder, since no body heat would be detected.
Control Unit: This is the brain of the alarm system. It receives signals from the sensors and activates the alert mechanism. Some units' access panels have features that will keep you from feeling like you are a prisoner in your own home. A bypass feature, or shunt, allows you to "arm" the system without having every window and door locked tight. Thus, if on a summer night you want to leave your bedroom window open while sleeping, you can program the system to trigger an alarm only if all other windows and doors in your home are breached. Or, say your son or daughter is out on a date, and is expected to return via the back door. You can program to system not to trigger an alarm if the back door is opened.

Another desirable feature in a control unit is an entry/exit delay mechanism. Say you turned on your alarm system when you left for work, and are now returning home. How does your alarm system know that you are not a burglar? An entry/exit delay feature gives you time (ideally 15 to 60 seconds) to enter your home and shut off the alarm system (by entering a secret code) before it starts to sound. A minimum delay of 15 seconds is suggested by experts to give you enough time to do this.

Alert Mechanism: Usually a loud bell, siren, or flashing strobe light, it warns neighbors and police patrols that your house is being burglarized. Some alert mechanisms come with an auto-dialer that calls one or more phone numbers and plays a pre-recorded message. Or, for a monthly fee, you can have your house monitored by security personnel who will summon help the instant they receive a tone-encoded signal - sent through a telephone or cable TV line - from your alarm system.

Other terms that are important:

Call-Back Scheme: This is another approach to dealing with false alarms. It works with alarm systems that call a monitoring service for help. If the alarm is tripped and your alarm system calls one of the company's monitoring stations, the first thing the operator does is call you back. If you say a pre-determined code word, the operator cancels the alarm. If not, the police are at your door.

Wireless versus Hard-Wired Systems: In wireless systems, the sensors are connected to the control units by tiny battery-powered transmitters. If the batteries fail, the system is vulnerable to an intruder. Hard-wired systems are more troublesome for burglars, especially if they trigger an alarm when the wires are cut. They usually require professional installation.

DIY Systems: Do-it-yourself systems are usually wireless, and modestly priced compared to professionally installed hard-wired systems. Wireless systems can be installed by virtually anyone. However, they are not as reliable and safe as hard-wired systems.
We hope that you found this information easy to understand. If you have any questions, or suggestions as to how to improve the information that we will give you in subsequent weeks, feel free to stop by or call the contact person.

Remember that we would like you not just to read and understand this material, but to memorize it. Reading it again would help you achieve this goal. It will also help you do better on the attached homework assignment. Finally, memorizing this information now would also help you when you take the "exam" later in the quarter.

(Detach the homework assignment when you submit it - you will need to use the rest of this handout again. Keep it in a safe place.)
HOMEWORK ASSIGNMENT #1 - DUE MONDAY, JANUARY 23

Name _______________________________ SS# ____________________

Answer each of the following questions based on the information given in handout #1:

1. Listed below are some terms that refer to home burglar alarm systems. Imagine that you are talking to a friend who knows nothing about such alarm systems, but is considering buying one. In your own words, how would you explain what each of these terms mean?
   
   (a) Perimeter Sensors
   (b) Alarm Monitoring Service
   (c) Call-Back Scheme

2. (a) What are false alarms? Identify 4 sources of false alarms listed in the handout.
   
   (b) Identify and explain one approach to minimizing false alarms (other than a call-back scheme).

3. This handout describes two examples of how a shunt feature in the control unit can be useful. What are they? Can you think of a third example? Describe it briefly.

*************** NOTE ***************

TO PRESERVE SPACE HERE, QUESTIONS HAVE CONDENSED ONTO A SINGLE PAGE.

IN THIS AND ALL SUBSEQUENT ASSIGNMENTS, THE QUESTIONS WERE SPACED APART OVER MULTIPLE PAGES TO PROVIDE STUDENTS WITH ADEQUATE ROOM TO FILL IN THEIR ANSWERS.
NOTE: This handout is only for students for whom the last digit of their Social Security # is an even number (0, 2, 4, 6, 8).

THE RESEARCH IN EDUCATION PROGRAM
at
THE OHIO STATE UNIVERSITY

Enclosed you will find:

A. Information packet #2 for the product you have been assigned.

B. Homework assignment #2. This assignment is due on **Monday, January 30** at the beginning of class.

Your homework assignments should reflect only your own effort. Please do not share your work with anybody else. By not doing your own work, you will destroy the validity of this research.

**CONTACT PERSON:** If you have any questions about any aspect of this research, please see Sunil Bhatla in 26 Hagerty Hall, or call him at 292-2959. If there is no answer, you may call 848-8656 and leave a message.

**IMPORTANT:** PLEASE RETAIN THIS HANDOUT FOR THE DURATION OF THE QUARTER
INFORMATION PACKET #2 : HOME BURGLAR ALARM SYSTEMS

No alarm system can make your house invulnerable. But the typical burglar is an opportunistic looking for easy pickings. Given a choice between a home with an alarm system and one without, a burglar would choose the one without. Police statistics from a wealthy New York City suburb bear that out. The police found that 90 percent of the burglaries in a six-year period occurred in homes without an alarm system. In the homes that had alarm systems and were burglarized, the system either didn't fully protect the house or wasn't turned on.

This week's material will focus on how to choose an alarm system. For any product that you purchase, you need to know what to look for in deciding between different brands. When you buy an automobile, you may consider mileage, cost, styling, and features such as a sunroof. Similarly, to choose an alarm system, one needs to know what attributes should be considered. Does it come with a “panic button?” How easy is it to install? What does it protect against?

We will describe the attributes (criteria) that one should use to choose an alarm system. Next week, you will learn more about these attributes - such as how to judge the quality of a particular feature that a brand claims to have.

Do it yourself or not? There are hundreds of products on the market, ranging from a $13 device you place on the inside of a doorknob to a $4,000 professionally installed system. Most do-it-yourself (DIY) alarm kits are only designed to protect one or two entrances. But you can buy additional sensors and monitor as many doors and windows as you want. Many of these systems include features such as a delay mechanism, panic button, bypass/shunt feature and/or smoke detector.

If you want a comprehensive alarm system, a professional installation might be well worth the expense. The International Security Systems Association (ISSA) has developed a rigorous set of guidelines to regulate professional installation of home burglar alarm systems. ISSA guarantees that these guidelines, if followed, will result in a high quality installation. ISSA further stipulates that it will pay for losses of up to $100,000 if a burglary occurs despite an ISSA-approved installation of an alarm system. The ISSA guidelines are summarized in the 5-step procedure below:

1. Assessment of vulnerable entry points that burglars might use to get into your home.
2. Choose appropriate types of sensors to protect each entry point according to ISSA sensor manual.
3. Inspection of all installation procedures by a company supervisor who has been certified by ISSA's training program.
4. Conduct the Trigger-Test: Simulate a break-in at each of the entry points and test the effectiveness of the installed alarm system using ISSA procedures.

5. Thoroughly explain the installation and working of the alarm system to the homeowner. After 30 days, the homeowner should be given an ISSA form that evaluates his/her satisfaction with the alarm system, and asked to mail the form directly to ISSA.

Industry experts (and Consumer Reports) recommend that you stay away from alarm systems manufacturers that do not use the ISSA-approved installation procedure. ISSA not only assures you of a professional installation but also protects you against loss due to theft.

**Price:** For DIY systems, the least expensive devices cost around $50; the more complex systems would cost upward of $200, depending on the layout of your home. Professionally installed systems typically start at $1,000. Experts recommend that in shopping for an alarm system, price should be a deciding factor only if all other factors are equal. It is more important to consider the reliability of the system, the safety it offers, and the features that are included. Another option is to rent an alarm system. However, buying an alarm system works out cheaper in the long run.

**Delay Feature:** Many systems have an entry and exit delay - giving you time to get in and out of your home without setting off the alarm. Some delays are fixed, others are adjustable. Look for an alarm system that gives you at least a 15-second delay - anything less is useless since the alarm may trigger before you have time to deactivate the system.

**Self-Silencer:** One important feature of an audible alarm is the ability for it to silence itself. An audible alarm doesn't have to be on for very long to scare away an intruder. If it sounds for more than 15 minutes or so, you are likely to irritate neighbors and police. Many municipalities now require that all audible alarms silence themselves.

**Audibility of Alarm:** An alarm sounding inside your house may not be audible outside, so it wouldn't be very effective at alerting your neighbor. In fact, a burglar could locate the alarm and destroy it, and then burglarize your home! Some alarm systems give you a choice of adding a separate alarm that can be placed indoors or outdoors. The alarm can be a horn, siren, bell, or other noisemaker. An outdoor alarm is much more effective, since the burglar knows that neighbors or police patrol units might hear the alarm.

**Auto Dialer:** When an alarm is triggered, an automatic telephone dialer can be used to forward a recorded emergency message to telephone numbers you designate. If you subscribe to an alarm monitoring service, you can program the auto dialer to call the service when an alarm is triggered. However, a burglar can foil it by cutting your telephone line. Some companies offer a telephone-monitoring product that solves this problem. If the line is cut, microprocessor-controlled equipment in the telephone company center automatically calls the customer's alarm monitoring service. Thus, if an alarm
system offers an auto dialer, make sure it comes with a telephone-monitoring devices that guards against your telephone line being cut.

**Panic Button:** With many systems you can attach a "panic button" - a button that sounds the alarm instantly when you press it. Some systems even come with panic buttons built in. Such a feature is enormously useful when you spot a burglar. In the panic of the moment, it is much easier to press a button and trigger the alarm than to try to get to the telephone to summon help.

At the same time, beware of panic buttons that require digital codes to activate the alarm. Research has shown that many people will forget the secret code needed to operate the panic button when they are in a panic. Even if they do remember the code, precious time can be lost while punching in each digit of the code. Look instead for a panic button that can be operated by simply pressing a pushbutton.

Further, a panic button that can be operated through a remote control device is much more preferable to one that is installed on the alarm system itself. This way, you won't have to run to the basement (or wherever else your alarm system's control unit is installed) in an emergency - you can trigger the alarm easily with the remote control panic button.

**False Alarms:** Security experts estimate that more than 90% of triggered burglar alarms are false alerts. False alarms can be troublesome because many communities issue fines if they become excessive. Systems that use dual sensors are much more capable of preventing false alarms than single-sensor systems. Also, look for an alarm monitoring service that offers a call-back scheme, rather than directly calling the police when your alarm triggers. This way, you can be assured that a false alarm will not bring the police to your door, possibly resulting in a fine.

**Bypass or Shunt Feature:** The purpose of this is to bypass or remove a sensor from the system while allowing the rest of the system to operate normally. Say you want to leave your bedroom window open while you sleep. Using a bypass switch, you can deactivate the sensor for that particular window while the alarm system continues to protect the rest of your house.

We hope that you found this information easy to understand. Remember that we would like you not just to read and understand this material, but to memorize it. Reading it again would help you achieve this goal. It will also help you do better on the attached homework assignment. Finally, memorizing this information now would also help you when you take the "exam" later in the quarter.

(Detach the homework assignment when you submit it - you will need to use the rest of the handout again. Keep it in a safe place.)
Answer each of the following questions based on the information given in handouts #1 and #2:

1. You are about to choose a burglar alarm system. Identify three attributes that you would consider to be most important in making your decision. Justify your answer by explaining why you consider these attributes to be most important.

2. In addition to the three attributes that you identified in answer to the previous question, which three other criteria would you pay most attention to in choosing an alarm system? Please also briefly describe why you consider these three criteria to be less important than the previous three.

3. You have just purchased an alarm system that gives you the choice of two ways to summon assistance in case of a break-in. One option is installing an audible alarm that can be placed indoors or outdoors, while the alternative is to use an automatic telephone dialer. Further assume that you live in a densely populated neighborhood, and that the potential for your system to generate false alarms is high. Also, the local police department imposes a stiff fine for false alarms.

Which option would you choose? Justify your answer.
NOTE: This handout is only for students for whom the last digit of their Social Security # is an even number (0, 2, 4, 6, 8).

THE RESEARCH IN EDUCATION PROGRAM

at

THE OHIO STATE UNIVERSITY

Enclosed you will find:

A. Information packet #3 for the product you have been assigned.

B. Homework assignment #3. This assignment is due on Monday, February 6 at the beginning of class.

Your homework assignments should reflect only your own effort. Please do not share your work with anybody else. By not doing your own work, you will destroy the validity of this research.

CONTACT PERSON: If you have any questions about any aspect of this research, please see Sunil Bhatla in 26 Hagerty Hall, or call him at 292-2959. If there is no answer, you may call 848-8656 and leave a message.

IMPORTANT: PLEASE RETAIN THIS HANDOUT FOR THE DURATION OF THE QUARTER
INFORMATION PACKET #3 : HOME BURGLAR ALARM SYSTEMS

Last week's handout described a number of criteria that you may use in choosing a home burglar alarm system. For example, you can buy a professionally installed or do-it-yourself (DIY) system. This week we will focus on the advantages and disadvantages of such features - which is better/worse, and why.

Installation: Professionals following ISSA guidelines usually put in a hard-wired system - it provides more protection. Experts know whether the sensors are placed in the proper position or will give weak signals because of factors such as metallic foil in your wallpaper. DIY systems are usually wireless, and may be more susceptible to false alarms. These systems used battery-powered transmitters - if the batteries fail, the system is vulnerable to an intruder.

Excessive false alarms can mean fines imposed by the local community or municipality. And due to the large number of calls, police in many cities no longer respond to remote-signalling devices that have proved false too many times. One piece of technology to combat this problem is the dual sensor (see handout #1). Such two-in-one sensors cost about 30 percent more than the $150 to $175 the consumer would pay for a single sensor, but are well worth it. In fact, it is advisable not to buy an alarm system that uses only single sensors - they are quite outdated, if not obsolete.

Some systems also feature a warning device, which tells you that the sensors have been tripped and gives you time to switch the system off if it's a false alarm.

Digital telephone dialers and alarm monitoring services are useful technological innovations to protect your home. They are a comforting link to outside help, but if the phone line goes down or gets cut, the system is worthless - and burglars know this. There are two solutions. A radio system is available that supplements phone lines. The transmitter sends alarm data to the monitoring service without the need for vulnerable phone lines. Monthly fees can run about $35 for this feature.

Second, a telephone-monitoring device is available. This device works by continuously transmitting a coded signal over telephone lines from the home to the nearest telephone switching center. If the line is cut, microprocessor-controlled equipment in the telephone company center automatically calls the customer's alarm company. This benefit can cost you about $120, in addition to a monthly monitoring fee of around $10.

Advanced Sensors: Some glass-break sensors are more advanced. They can pick up the distinctive sound of breaking glass: an initial burst of sound in the low-frequency range of 6,000 to 10,000 cycles, followed by a secondary "tinkling" wave of sound at a higher frequency of about 12,000 cycles. Such advanced sensors only trigger an alarm when both low- and high-frequency bursts are detected in the correct order. This is an advantage over conventional glass-break sensors which mistakenly call out the cops for similar sounds made by airplanes, jangling keys, telephones, and alarm clock bells.
Disadvantage: the advanced sensor wouldn't be triggered if the burglar used a glass cutter.

Call-Back Scheme: Don't waste your money on an alarm monitoring service that does not offer a call-back scheme. Better monitoring services will first call you back before summoning the police. If you say a pre-arranged code word, the operator knows that you are okay, and that there is no need to call the police. This way, you are protected from having to pay stiff fines every time your alarm system is falsely triggered.

Entry/Exit Delay: Make sure you get an entry/exit delay that is adjustable. Depending on where your alarm system is installed in your home, you may need anywhere from 15 to 60 seconds to reach it and deactivate the alarm. Obviously, if your alarm system's delay feature is fixed, or is less than 15 seconds, it increases the likelihood of triggering a false alarm.

Costs involved: Various charges are incurred through installing a burglar alarm system. Obviously, the less you pay for a given system, the more value you get for your money. The largest expense is usually made through your decision about buying a DIY or professionally installed system. However, rather than make this decision solely on price, you should evaluate your security needs and determine which type of system is more appropriate. Once you decide on a particular type of system, you can then shop around and find out the features offered by alternative brands, and their prices.

Additional expenses to purchase and maintain an alarm system are varied. Your city may impose a fine (about $15) if your system generates more than a certain number of false alarms. Linking your system to a monitoring station can cost about $20 to $25 monthly. But a monitoring service may get you a 10% discount on your homeowner's insurance premium; systems without a monitoring service may save you only 2%.

Extra Features: Some systems give ordinary touch-tone telephones the capacity to access and control hard-wired burglar alarm systems. You punch in a private code - a secret sequence of digits - to activate or disarm the alarm. Some of these systems also link with common household appliances so you can turn on air conditioners or heaters by remote control at the same time you arm your electronic watchdog. By controlling lamps and appliances via remote telephone, you can give your home that lived-in look that burglars bypass. Thus touch tone remote control can be a very valuable feature.

We hope that you found this information easy to understand. If you have any questions, or suggestions as to how to improve the information that we will give you in subsequent weeks, feel free to stop by or call the contact person.

Remember that we would like you not just to read and understand this material, but to memorize it. Reading it again would help you achieve this goal. It will also help you do better on the attached homework assignment. Finally, memorizing this information would also help you when you take the "exam" later in the quarter.
(Detach the homework assignment when you submit it - you will need to use the rest of the handout again. Keep it in a safe place.)

HOMEWORK ASSIGNMENT #3 - DUE MONDAY, FEBRUARY 6

Name ___________________________ SS# ___________________________

Answer each of the following questions based on the information given in handouts #1,2 and 3:

1. (a) Why is a telephone-monitoring device necessary if your alarm system has an automatic dialer? Explain.
   
   (b) Describe the advantage of an advanced glass-break sensor over a conventional sensor. Why do you think the advanced sensor wouldn't be triggered if the burglar uses a glass cutter?

2. Gary and Susan Ford are homeowners who have no children. They both work, and their jobs require them to travel a lot. There are many occasions when neither of them is in town, and they would like to protect their property. They are currently in the process of choosing between 2 professionally installed systems (Brands A and B). Although the two brands are similar in many respects, they differ on 3 attributes. Brand A comes with a panic button, while B does not. Both brands come with an automatic telephone dialer, but while Brand A offers the option of adding a telephone-monitoring device to the system, Brand B offers a radio system that supplements phone lines. Finally, only Brand B offers the ability to control the alarm system via remote touch-tone telephone.

   Gary and Susan have asked you to help them make their choice. What would you recommend? Justify your recommendation in detail.

3. With reference to the previous question, you are now told that Brand A has just introduced advanced glass-break sensors, along with dual sensors. Brand B does not offer either of these two options. Would your recommendation to Gary and Susan change? If it would, explain why. If it wouldn't, explain why not.
NOTE: This handout is only for students for whom the last digit of their Social Security # is an even number (0, 2, 4, 6, 8).

Enclosed you will find:

A. Information packet #4 for the product you have been assigned.

B. Homework assignment #4. This assignment is due on Monday, February 13 at the beginning of class.

Your homework assignments should reflect only your own effort. Please do not share your work with anybody else. By not doing your own work, you will destroy the validity of this research.

CONTACT PERSON: If you have any questions about any aspect of this research, please see Sunil Bhatla in 26 Hagerty Hall, or call him at 292-2959. If there is no answer, you may call 848-8656 and leave a message.

IMPORTANT: PLEASE RETAIN THIS HANDOUT FOR THE DURATION OF THE QUARTER
INFORMATION PACKET #4 : HOME BURGLAR ALARM SYSTEMS

In 390 B.C., the honking of geese is said to have roused the Romans in time to save their city from the Gauls. Today's homeowners can summon legions of guards at fairly low cost with security systems that honk electronically in case of a burglary.

Living with an alarm system is, in a way, living under siege. It is like having a permanent house guest. It diminishes your freedom in your own home. You and your family must remember that the alarm system is there and change your habits to suit its peculiarities. You may find that you can't live that way. Before you spend the money for an expensive system, consider carefully whether it's the right one for you.

Purpose of System: No single alarm or system can possibly suit every requirement. A rambling colonial obviously needs a very different system from a studio apartment on the eighth floor. The exterior siren that would summon help in a densely populated neighborhood would be fairly useless in an isolated house in the country. Pets can preclude using certain types of single sensors (ultrasonic and microwave motion detectors, for instance). Whatever system you choose, make it as simple as possible.

Your choice also depends on whether your main intention is to protect yourself while you're at home or to protect your property while you're away. To safeguard your possessions, scare tactics (such as a loud siren) may be sufficient. To protect yourself, you'd probably add some provision for summoning help, such as an alarm monitoring service. Further, to minimize the possibility of false alarms, use a monitoring service that offers a call-back scheme.

Type of System: According to Consumer Reports, the best and most reliable type of alarm system is a wired perimeter system installed according to ISSA guidelines. Because such a system can be difficult to install - especially if your home is large or if you want to hide the wires - installation of a wired perimeter system is probably best left to a professional. The main advantage of a perimeter system is that it sounds an alarm before an intruder get inside or very far inside your house.

An interior sensor system is easier to install, and an interior sensor can often guard more area than one perimeter sensor. But interior sensors don't sound an alarm until an intruder is already inside. And they restrict your own movements within the house when they are turned on.

Of the various types of sensors, dual sensors are best at minimizing false alarms. Only if it is absolutely impossible to get an alarm system with dual sensors, then single sensors should be considered. With dual sensors, you don't have to worry about exposing them to objects that change temperature rapidly (radiators, air-conditioners and the like), or to
direct sunlight. A dual sensor programmed to detect the warmth and movement of a burglar will not be fooled by changes in temperature alone.

**Type of Siren:** Some systems contain a built-in siren. However, such an alarm may be not effective in scaring a thief away. A siren sounding inside your house may not be audible outside, so it wouldn't be very effective at alerting a neighbor or police patrol. And a siren built into your alarm system could draw attention to the system, allowing the intruder to quickly smash it or otherwise disable it. Better systems give you the choice of adding a separate alarm that can be placed outdoors, where it can really be effective.

**Other Benefits:** A comprehensive security system can protect against more than intruders. Smoke and heat detectors are commonly connected to a perimeter system and can be linked to an alarm monitoring service. Other types of sensors are also available - temperature sensors and moisture detectors, for instance, to protect against burst or frozen water pipes.

If you are away from home a lot, you might want to invest in a system that you can control from any Touch Tone telephone. You can check on your house while you're traveling, for example. Or you can temporarily disarm the equipment from your office to let in visitors in your absence. Some of these systems also let you control lamps and appliances remotely, giving your house the lived-in look that burglars bypass.

You should consider these extra features carefully, despite their cost. You are better off buying an alarm system that is capable of expanding to meet your future needs, rather than being stuck with an obsolete system that becomes inadequate in a couple of years.

We hope that you found this information easy to understand. If you have any questions, or suggestions as to how to improve the information that we will give you in subsequent weeks, feel free to stop by or call the contact person.

Remember that we would like you not just to read and understand this material, but to memorize it. Reading it again would help you achieve this goal. It will also help you do better on the attached homework assignment. Finally, memorizing this information would also save you from having to re-read it when we test you again later.

(Detach the homework assignment when you submit it - you will need to use the rest of the handout again. Keep it in a safe place.)
HOMEWORK ASSIGNMENT #4 - DUE MONDAY, FEBRUARY 13

Name ___________________________ SS# ___________________________

Answer each of the following questions based on the information given in handouts #1,2,3 and 4:

1. As a burglar alarm expert, you have been asked to select a security system for a customer (Bob Binder). In order to choose the right alarm system for Bob's home, what information would you need to ask him? List all the questions that you would ask. (For example, you would ask Bob if he had any pets that might trigger false alarms).

2. The next step is to answer the questions you posed to Bob. Pretending that you are Bob, write down below your answer to each of the questions you listed on the previous page. (Since individual needs and situations differ, there is obviously no correct answer to each of the questions you listed previously. Use your judgement and put yourself in the place of Bob to provide answers to the questions you listed).

3. Now that you have got all the information you needed from Bob, you have to select aburglar alarm system for him. You contact all the manufacturers of alarm systems, and find that there is no one system that can meet all of Bob's requirements. Fortunately, one manufacturer has offered to build a customized system for Bob. List below all the features that, based on Bob's information, you would like the manufacturer to include in the alarm system.
NOTE: This handout is only for students for whom the last digit of their Social Security #
is an even number (0, 2, 4, 6, 8).

THE RESEARCH IN EDUCATION PROGRAM

at

THE OHIO STATE UNIVERSITY

Enclosed you will find:

A. Information packet #5 for the product you have been assigned.

B. Homework assignment #5. This assignment is due on Monday, February 20 at the
   beginning of class.

Your homework assignments should reflect only your own effort. Please do not share your
work with anybody else. By not doing your own work, you will destroy the validity of this
research.

CONTACT PERSON: If you have any questions about any aspect of this research, please
see Sunil Bhatla in 26 Hagerty Hall, or call him at 292-2959. If there is no answer, you may
call 848-8656 and leave a message.

IMPORTANT: PLEASE RETAIN THIS HANDOUT FOR THE DURATION OF THE
QUARTER
Dr. Joseph H. Sox decided that he wasn't going to take it anymore. His home in Alabama had been burglarized three times within a year. He drilled holes in 15 pipes and placed a firing pin in each hole. He loaded the pipes with buckshot and powder and fitted each pipe with a rat-trap triggered by fishline stretched across approaches to his house. Then, late last year, he tripped over one of his fishlines, snapping a trap and causing one of the pipe guns to fire at his own chest. He barely survived the wounds. Had he killed a real burglar with this booby trap, said Sheriff Don Harell, "I would have charged the doctor with murder."

Crime in this country comes too close to home, too often. In fact, a burglary occurs every 10 seconds, according to the FBI. Of course, the solution doesn't lie in home-built land mines or booby traps, particularly because of the array of professionally designed home security equipment that's now available. Some of these new devices come equipped to talk, with a vocabulary roughly equal to that of a young child. Others listen, their sensitivity acute enough to distinguish between jangling keys and breaking glass.

Described below are some of the major brands of burglar alarm systems that are available to security-minded consumers.

1. Intelectron's Home Guard System

What you get: Intelectron's largest system package protects up to five windows or doors. Additional sensors for the wireless system can be purchased separately.

Special Features: The Home Guard System includes a remote controller, which allows you to activate or deactivate the siren from any location within 50 feet of the wall-mounted central control unit. The system includes a backup power source in case of electrical outages. The sensors can be installed with either screws or double-sided tape.

Cost: About $250 for the above system with five sensors. Additional sensors cost around $25 each.

2. Fortress Security System

What you get: The Fortress system monitors six doors or windows. The system will accept up to 50 additional sensors.

Special Features: Because all sensors must be wired to each other to form a circuit, the Fortress system is unaffected by radio signal interference that can cause false alarms with some wireless systems. However, the additional wiring means that installation
takes a bit longer than with wireless alarms. The package includes both an indoor and an outdoor siren. The alarm silences itself after sounding for 9 minutes.

Cost: $125 for the basic package that includes six sensors. Additional sensors are available for about $6 each.

3. Schlage's Keepsafer System

What you get: The Keepsafer package - a wireless system - will protect two doors or windows. The Keepsafer Plus kit will protect three openings, and comes with a remote control. Additional sensors can be purchased to protect more doors and windows. The system also has an exit/entry delay feature.

Special Features: For an extra $100, plus a $15 monthly service charge, you can equip your system with an emergency dialer. When the alarm sounds, a Schlage operator calls up to five numbers of your choice, including police, fire, and medical departments.

Cost: About $200 for the Keepsafer, and about $350 for the Keepsafer Plus. Additional sensors cost about $25 each.

4. FS-500 DialSafe System

What you get: A hard-wired burglar alarm system that enables you to control it from any Touch Tone telephone. As with a standard alarm system digital keypad, you punch in a private code - a secret sequence of digits - to activate or deactivate the alarm.

Special Features: It gives you a spoken report on the alarm system from a phone either inside your home or outside it. Not only will it tell you if an alarm has been tripped, but also where the break occurred. If you are in the house when the alarm goes off, you can pick up any phone and ask for a status report. It will say, for example, "The door to the garage is in alarm." That means don't go near the garage.

Cost: Cost of the full system, with control unit and sensor, including programming the voice chip, is about $900 installed.

5. The Bug

What you get: A wireless alarm system with sound sensors that are tuned to typical burglar's sounds - metal scraping against glass, splintering wood, etc. Each sensor plugs into a wall outlet. When activated, the sensor transmits a signal through the
house wiring to the master unit, which triggers a spotlight and horn to frighten burglars away.

Special Features: If the device fails to go off during a burglary, the company promises to reimburse you for losses up to the full cost of the system.

Cost: A system with four sensors, the master unit, spotlight and horn, costs about $1300 installed. The price is the same even if you install it yourself.

Remember that we would like you not just to read and understand this material, but to memorize it. Reading it again would help you achieve this goal. It will also help you do better on the attached homework assignment. Finally, memorizing this information would also save you from having to re-read it when we test you again later.

(Detach the homework assignment when you submit it - you will need to use the rest of the handout again. Keep it in a safe place.)
Answer each of the following questions based on the information given in handouts #1, 2, 3, 4 and 5:

1. You are in the process of choosing an alarm system (from the set of five brands described in the handout) for your current residence, whether it be an apartment that you share with other students, or a house.
   a. First describe the most important characteristics of your apartment/house that you need to keep in mind while choosing an alarm system.
   
   b. Keeping in mind the characteristics you described on the previous page, select the brand of alarm system (from the five described in the handout) that you think is most suitable for you. Be sure to justify your answer. In making your decision, assume that if a feature is not mentioned for a particular brand, the feature is not available for that brand.
   
   c. Obviously, no alarm system that is mass-produced can "perfectly" meet every individual's exact requirements. Consider the alarm system that you named as your "best choice" on the previous page. If you could improve it (e.g., add features that you desire, or delete features that you don't find necessary), how would you do so?
APPENDIX B

OBJECTIVE KNOWLEDGE EXAM
Circle the letter that represents the best answer to each question.

1. Alarm systems with a "panic button" allow you to:
   a. trigger the alarm manually by pressing a button.
   b. send an alert signal directly to the police.
   c. trigger the alarm remotely by pressing the "*" button on a touch tone telephone.
   d. immediately turn off an alarm if it was triggered by mistake.
   e. All of the above.
   f. None of the above.

2. A dual sensor:
   a. is more susceptible to false alarms.
   b. combines perimeter and interior sensors in one unit.
   c. minimizes false alarms.
   d. is used in an alarm system that simultaneously protects two different parts of a house.
   e. requires independent confirmation from the alarm monitoring station before triggering the alarm.
   f. None of the above.

3. A Call-Back Scheme:
   a. is a very useful feature when your alarm system cannot call a monitoring service for help.
   b. works better with alarm systems that use dual sensors.
   c. minimizes false alarms.
   d. automatically forwards a pre-recorded message to wherever you are.
   e. is not necessary if your alarm system incorporates single sensors.
   f. None of the above.

4. Which of the following is not true of the ISSA installation procedure for alarm systems?
   a. Assessment of vulnerable entry points into your home.
   b. Choice of appropriate sensor types according to the ISSA manual.
   c. Inspection of installation procedure by an ISSA certified supervisor.
   d. Conduct a trigger test.
   e. Have owner fill out evaluation form and mail to ISSA.
   f. All of the above are true.
5. Which of the following statements about false alarms is incorrect?

a. A hard-wired system is more prone to false alarms than a wireless system.
b. Many communities issue fines for excessive false alarms.
c. Security experts estimate that more than 90% of triggered burglar alarms are false alerts.
d. Some systems are better designed to prevent false alarms than others.
e. Single sensor systems are not very good at minimizing false alarms.
f. Both d and e.

6. Which of the following statements about a shunt feature is incorrect?

a. It keeps you from feeling like a prisoner in your own home.
b. It safeguards against activating the alarm system unless all windows and doors are locked tight.
c. It allows you to bypass or remove a sensor from system.
d. It is useful if you want to leave open your bedroom window while you sleep.
e. a and d.
f. All of the above statements are correct.

7. Which of the following are currently available to supplement auto dialers?

a. A radio system that sends alarm data to the monitoring company without the need for a phone line.
b. A telephone-monitoring device that continuously transmits a coded signal over telephone lines.
c. A system that uses a back-up phone line to forward the emergency message.
d. a and b.
e. a and c.
f. a, b and c.

8. The monthly charge to link your alarm system to a monitoring station runs about:

a. $5 to $10.
b. $20 to $25.
c. $50 to $65.
d. A minimum of $75.
e. No separate monthly charge is required.
f. None of the above.
9. The best type of entry/exit delay feature gives you _______ before triggering alarm.
   a. 10 seconds or less.
   b. 15 seconds.
   c. 15 to 30 seconds.
   d. 15 to 60 seconds.
   e. None of the above.
   f. It doesn't matter - any entry/exit delay is undesirable.

10. Which of the following is not a desirable extra feature of an alarm system?
    a. Touch tone remote control.
    b. Temperature sensors.
    c. Indoor alarm.
    d. Single sensors.
    e. c and d.
    f. b, c and d.
APPENDIX C

QUESTIONNAIRE USED IN MAIN STUDY
In this section, we are interested in what went through your mind while looking at the advertisement for the GUARDIAN burglar alarm system. The next page contains the form we have prepared for you to use to describe those thoughts, ideas or images that occurred to you while looking at the ad.

Simply write down the first thought/idea/image in the first box, the second one in the second box, etc. Please put only one thought/idea/image in a box. Your thoughts may have been all favorable to the product or ad, all opposed, irrelevant (e.g., a thought or image about something other than the product or ad), or some combination of these. Any case is fine.

But please do not list any new thoughts (i.e., thoughts that occur to you now but did not occur while looking at the ad). Do not worry about spelling, grammar, or punctuation. There may be more boxes than you will need to describe your thoughts and images. So don't worry if you can't fill every box. Take as much time as you need.

TURN OVER THE PAGE AND BEGIN LISTING YOUR THOUGHTS NOW.
My thoughts/images/ideas about the ad and product were:

- 
- 
- 
- 
- 
- 
- 
- 
- 
- 

WHEN YOU HAVE FINISHED LISTING YOUR THOUGHTS, TURN THE PAGE.
SECTION II: This section focuses on your knowledge about home burglar alarm systems. Put an 'X' in the appropriate category of each response scale.

1. Rate your knowledge of home burglar alarm systems, as compared to the average consumer, on the following scale:
   
   One of the LEAST Knowledgeable __:__:__:__:__:__:__ One of the MOST Knowledgeable

2. Compared to the average consumer, I would rate my knowledge of home burglar alarm systems as:
   
   far above average __:__:__:__:__:__:__ far below average

3. Please indicate how strongly you agree or disagree with the following statements:

   "I feel that I have enough knowledge about home burglar alarm systems to make an informed purchase decision"
   strongly agree __:__:__:__:__:__:__ strongly disagree

   "I am very knowledgeable about home burglar alarm systems"
   strongly agree __:__:__:__:__:__:__ strongly disagree

4. We would like to know how confident you feel about the knowledge rating you provided on the scale above ("I am very knowledgeable about home burglar alarm systems"). Depending on how confident you were in expressing that rating, put an 'X' in the appropriate category of each of the following scales:

   very confident __:__:__:__:__:__:__ not at all confident
   very uncertain __:__:__:__:__:__:__ very certain
Section II: This section focuses on your reactions to the GUARDIAN burglar alarm system product. Please answer each of the following questions by placing an 'X' in the appropriate category of each response scale.

1. How would you describe your overall feelings about the GUARDIAN burglar alarm system?
   
   very good __:___:_:___:__:_:___ very bad
   very unfavorable __:___:_:___:__:_:___ very favorable
   like very much __:___:_:___:__:_:___ dislike very much
   very negative __:___:_:___:__:_:___ very positive

   We would like to know how confident you feel about the ratings of the Guardian burglar alarm system that you provided above. Depending on how confident you were in expressing those ratings, put an 'X' in appropriate category of each of the following scales:
   
   very confident __:___:_:___:__:_:___ not at all confident
   very uncertain __:___:_:___:__:_:___ very certain

2. My buying the GUARDIAN burglar alarm system when it becomes available is:

   very good __:___:_:___:__:_:___ very bad
   very foolish __:___:_:___:__:_:___ very wise
   very desirable __:___:_:___:__:_:___ very undesirable

3. Please provide your best estimate of the price of the GUARDIAN burglar alarm system:

   $________

   How confident are you that your price estimate corresponds exactly to the real price of the GUARDIAN burglar alarm system?
   
   very confident __:___:_:___:__:_:___ not at all confident
   very uncertain __:___:_:___:__:_:___ very certain
Now please tell us how much you would be willing to pay for the GUARDIAN burglar alarm system:

$________

SECTION III: This section focuses on the GUARDIAN burglar alarm system advertisement shown to you. Please answer each of the following questions by placing an 'X' in the appropriate category of each response scale.

1. While reading the GUARDIAN advertisement, I was:

   very involved __:__:__:__:__:__: very uninvolved
   concentrating very little __:__:__:__:__:__: concentrating very hard
   paying a lot of attention __:__:__:__:__:__: paying very little attention

2. Please indicate how strongly you agree or disagree with the following statements:

   "I carefully considered the claims made about GUARDIAN in the ad"
   strongly agree __:__:__:__:__:__: strongly disagree

   "I was trying to form an accurate impression of the product"
   strongly agree __:__:__:__:__:__: strongly disagree
SECTION IV: This section focuses on your opinions about home burglar alarm systems. Put an 'X' in the appropriate category of each response scale.

1. For me, a burglar alarm system that is professionally installed is:
   
   very good __:__:__:_:_:_:_:_:_ very bad
   very desirable __:__:__:_:_:_:_:_:_ very undesirable

2. For me, a burglar alarm system that has advanced sensors is:
   
   very good __:__:__:_:_:_:_:_:_ very bad
   very desirable __:__:__:_:_:_:_:_:_ very undesirable

3. For me, a burglar alarm system that is linked to an alarm monitoring service with a call-back scheme is:
   
   very good __:__:__:_:_:_:_:_:_ very bad
   very desirable __:__:__:_:_:_:_:_:_ very undesirable

4. For me, a burglar alarm system that has an adjustable entry/exit delay is:
   
   very good __:__:__:_:_:_:_:_:_ very bad
   very desirable __:__:__:_:_:_:_:_:_ very undesirable

5. For me, a burglar alarm system that has a shunt feature is:
   
   very good __:__:__:_:_:_:_:_:_ very bad
   very desirable __:__:__:_:_:_:_:_:_ very undesirable

6. For me, a burglar alarm system that has a panic button operated by a digital code is:
   
   very good __:__:__:_:_:_:_:_:_ very bad
   very desirable __:__:__:_:_:_:_:_:_ very undesirable
7. For me, a burglar alarm system that is competitively priced is:
   very good __:__:___:__:_:__:___ very bad
   very desirable __:__:___:__:_:__:___ very undesirable

8. For me, a burglar alarm system that offers extra features is:
   very good __:__:___:__:_:__:___ very bad
   very desirable __:__:___:__:_:__:___ very undesirable

9. How likely is it that GUARDIAN is professionally installed?
   very likely __:__:___:__:_:__:___ very unlikely
   very probable __:__:___:__:_:__:___ very improbable

10. How likely is it that GUARDIAN has advanced sensors?
    very likely __:__:___:__:_:__:___ very unlikely
    very probable __:__:___:__:_:__:___ very improbable

11. How likely is it that GUARDIAN has an alarm monitoring service with a call-back scheme?
    very likely __:__:___:__:_:__:___ very unlikely
    very probable __:__:___:__:_:__:___ very improbable

12. How likely is it that GUARDIAN has an adjustable entry/exit delay feature?
    very likely __:__:___:__:_:__:___ very unlikely
    very probable __:__:___:__:_:__:___ very improbable

13. How likely is it that GUARDIAN has a shunt feature?
    very likely __:__:___:__:_:__:___ very unlikely
    very probable __:__:___:__:_:__:___ very improbable
14. How likely is it that GUARDIAN has a panic button operated by a digital code?

very likely __:__:__:__:__ very unlikely

very probable __:__:__:__:__ very improbable

15. How likely is it that GUARDIAN is competitively priced?

very likely __:__:__:__:__ very unlikely

very probable __:__:__:__:__ very improbable

16. How likely is it that GUARDIAN's extra features are better than other brands?

very likely __:__:__:__:__ very unlikely

very probable __:__:__:__:__ very improbable

SECTION V: This section also focuses on the GUARDIAN burglar alarm system advertisement shown to you. Please answer each of the following questions by placing an 'X' in the appropriate category of each response scale.

1. In obtaining your evaluation of the ad, we would like for you to distinguish between two basic components of the ad. The first component involves the claims made about the product. The second component involves the remaining elements within the ad such as the format, pictures or illustrations, colors, type style, spacing, and so forth. Concerning the first component, how would you evaluate the claims made about GUARDIAN?

very favorable __:__:__:__:__ very unfavorable

very negative __:__:__:__:__ very positive

very good __:__:__:__:__ very bad

very unpersuasive __:__:__:__:__ very persuasive

very strong __:__:__:__:__ very weak

very uninformative __:__:__:__:__ very informative

very believable __:__:__:__:__ very unbelievable
2. Concerning the second component, how would you evaluate the remaining elements (everything except the claims) within the GUARDIAN ad?

- very positive
- very negative
- very good
- very bad
- very unfavorable
- very favorable
- very weak
- very strong
- very persuasive
- very unpersuasive

3. We now want your overall evaluation of the ad. That is, all things considered (both claims and everything else), how would you describe your overall impression about the GUARDIAN advertisement?

- very good
- very bad
- very effective
- very ineffective
- very uninteresting
- dislike very much
- like very much
- not at all irritating
- very irritating

SECTION VI: In this section, we are interested in what you can remember about the GUARDIAN ad. In the space below, please list everything the ad said about the product. Then describe the illustrations or pictures contained within the ad.

***The question appeared on the top of a fresh page, the remainder of which was left blank for the recall task***
SECTION VII: The purpose of the following scales is to measure a person's involvement or interest in home burglar alarm systems. To take this measure, we need you to judge the product against a series of descriptive scales according to how YOU perceive the product. Please put an 'X' in the appropriate category of each response scale.

<table>
<thead>
<tr>
<th>HOME BURGLAR ALARM SYSTEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>important <strong>:</strong>:<strong>:</strong>:<strong>:</strong></td>
</tr>
<tr>
<td>of no concern <strong>:</strong>:<strong>:</strong>:<strong>:</strong></td>
</tr>
<tr>
<td>irrelevant <strong>:</strong>:<strong>:</strong>:<strong>:</strong></td>
</tr>
<tr>
<td>means a lot to me <strong>:</strong>:<strong>:</strong>:__</td>
</tr>
<tr>
<td>useless <strong>:</strong>:<strong>:</strong>:<strong>:</strong></td>
</tr>
<tr>
<td>valuable <strong>:</strong>:<strong>:</strong>:<strong>:</strong></td>
</tr>
<tr>
<td>trivial <strong>:</strong>:<strong>:</strong>:<strong>:</strong></td>
</tr>
<tr>
<td>beneficial <strong>:</strong>:<strong>:</strong>:<strong>:</strong></td>
</tr>
<tr>
<td>matters to me <strong>:</strong>:<strong>:</strong>:__</td>
</tr>
<tr>
<td>uninterested <strong>:</strong>:<strong>:</strong>:__</td>
</tr>
<tr>
<td>significant <strong>:</strong>:<strong>:</strong>:__</td>
</tr>
<tr>
<td>vital <strong>:</strong>:<strong>:</strong>:<strong>:</strong></td>
</tr>
<tr>
<td>boring <strong>:</strong>:<strong>:</strong>:__</td>
</tr>
<tr>
<td>unexciting <strong>:</strong>:<strong>:</strong>:__</td>
</tr>
<tr>
<td>appealing <strong>:</strong>:<strong>:</strong>:__</td>
</tr>
<tr>
<td>mundane <strong>:</strong>:<strong>:</strong>:__</td>
</tr>
<tr>
<td>essential <strong>:</strong>:<strong>:</strong>:__</td>
</tr>
<tr>
<td>undesirable <strong>:</strong>:<strong>:</strong>:__</td>
</tr>
<tr>
<td>wanted <strong>:</strong>:<strong>:</strong></td>
</tr>
<tr>
<td>not needed <strong>:</strong>:<strong>:</strong></td>
</tr>
</tbody>
</table>
SECTION VIII: Please answer each of the following questions.

1. In the space below, please describe what you believe is the purpose of this study.

2. Did you associate this study with any other research project that you participated in? (circle one)

   Yes    No

   If you circled yes, briefly describe that research project in the space below. Also describe why you associated that research project with this study.

3. Earlier this quarter, you may have participated in a 5-week long research project that involved learning information about a product category, and completing a series of homework assignments.

   I did participate in the 5-week research project: (circle one)

   Yes    No

   If you circled no, turn to the next page. If you circled yes, please answer the following question:

   Are you aware of any link between the 5-week project and this study? (circle one)

   Yes    No

   If you circled yes, briefly describe what you believe to be the link between that project and this study in the space below.

4. Have you previously participated in a study that involved GUARDIAN burglar alarm systems? (circle one)

   Yes    No

Thank you for your time. Please close this folder and wait quietly until everybody is finished.
APPENDIX D

CODING SCHEME FOR ADVERTISEMENT RECALL
I. CLAIMS:

A. 1. PROFESSIONALLY INSTALLED

2. Freelance installed
   OR
   guaranteed by ISSA.

3. Freelance installers will evaluate your needs and choose appropriate methods of installation.
   OR
   Our staff will install your alarm system using ISSA's 5-step procedure.

B. 1. ADVANCED SENSORS

2. Single sensors
   OR
   Dual sensors

3. Our R&D department has designed the Guardian system to incorporate only single sensors.
   OR
   Our R&D department has designed the Guardian system to incorporate only dual sensors.

C. 1. ALARM MONITORING SERVICE

2. Call the police
   OR
   Call-back scheme

3. Linked to our monitoring service. The instant an alarm is triggered, we call the police.
   OR
   Linked to our monitoring service. The instant an alarm is triggered, we initiate the call-back scheme.

D. 1. ENTRY/EXIT DELAY

2. Fixed delay
   OR
   Adjustable delay
3. 7 second entry/exit delay.
   OR
   Adjustable from 15 to 60 seconds.

E. 1. PANIC BUTTON

2. Digital code
   OR
   Press a button

3. Installed on control unit and uses a 9-number digital code.
   OR
   Activated simply by pressing a button on a remote-control device.

F. 1. SHUNT FEATURE

2. Close all windows/doors
   OR
   Selected doors

3. Activates alarm only when all windows and doors are closed.
   OR
   Restricts the alarm to selected doors.

G. 1. REASONABLY PRICED

2. Nationwide distribution network
   OR
   Competitive prices

3. Our nationwide distribution network sells as many alarm systems as the
   competition. Our prices are competitive.

H. 1. EXTRA FEATURES

2. Offers extra features to choose from
   OR
   Built-in extra features

3. Other types of single sensors and an indoor alarm.
   OR
   Touch tone remote control and temperature/moisture sensors.
II. INTRODUCTION and CLOSING

A. This can happen to you...
B. ...if you don’t get Guardian.
C. Call your local dealer today.

III. BRAND NAME

IV. PICTURES

This category includes the picture on the top right hand side of the ad and the illustration of the product in the lower left corner.

If the student reproduced one or both of the pictures, the Drawing classification scheme was used. If the student describes the pictures verbally, the Verbal classification scheme was used.

Note: If the student drew the picture and described it verbally, it was not counted twice. Credit was given for the drawing, then we checked to see if the verbal description contained anything that was not in the drawing - and gave credit only for the unique elements.

A. DRAWING CLASSIFICATION SCHEME

1. Picture (i.e., the student indicates that there was picture in the top right corner/bottom left corner of ad but does recall its content).
2. Picture of couple.
3. Picture of broken-into apartment.
4. Picture of product.

B. VERBAL CLASSIFICATION SCHEME

1. Picture (i.e., the student indicates that there was picture in the top right corner/bottom left corner of ad but does recall its content).
2. Picture of couple.
3. Picture of broken-into apartment.
4. Picture of product.

C. Recall relating to any of the filler ads.
V. IRRELEVANT: Statements/drawings that do not correspond to any element of the advertisement.

VI. UNCLASSIFIABLE: Statements/drawings that cannot be unambiguously classified into any one of previous categories.
APPENDIX E
COGNITIVE RESPONSE CODING SCHEME
CLASSIFICATION BASED ON FOCUS OF THOUGHT

I. AD-RELATED THOUGHTS

A. Thoughts About Picture of the Couple

  - Affect toward picture (like/dislike)
  - Appropriateness/relevance of picture to advertisement
  - Feelings generated by picture
  - References to self/personal experiences
  - Attention-getting properties of picture

B. Copy-related Thoughts

  - Reactions to opening statement
  - Reactions to closing statement
  - Reactions to the amount of information
  - Reactions to information content

C. Other Ad Thoughts

  - Layout, setup, design, print size, style, exclamation marks, and colors of the
    ad [excluding colors of the product picture - these would be classified
    under product-picture thoughts]
  - Thoughts about the ad that cannot be classified in any other category

D. Overall evaluation of ad

  - Simple affect (like/dislike)
  - Evaluation of effectiveness
II. BRAND-RELATED THOUGHTS

A. *Name*

Simple evaluation
Elaborated evaluation (didn't like the name because some specific perceptual criterion is mentioned)
Association of name with other objects (reminded me of...)
Inferences from the name to the product

B. *Product Picture*

Affect toward picture (like/dislike)
Appropriateness/relevance of picture
Association of product in picture with other brands (reminded me of...)
Inferences from the picture to the product
Attention-getting properties of the product picture

C. *Product*

Thoughts about the advertised product, about one or more of its attributes, comparisons of the product with other brands, thoughts about burglar alarm systems, etc.

D. *Attribute evaluations*

Thoughts that express an evaluation of one or more attributes of burglar alarm systems.

E. *Overall evaluation of brand*

Simple affect (like/dislike)
Behavioral intention

III. THOUGHTS RELATING THE AD/PRODUCT TO THE LONGITUDINAL KNOWLEDGE MANIPULATION

(e.g., I learned this stuff in class, I understood this information because of the other project, etc.)
IV. IRRELEVANT THOUGHTS

Thoughts that do not bear any relevance to any aspect of the advertisement or the product.
Subsequently generated thoughts (e.g., I spent a lot of time looking at the ad).
Thoughts related to the filler ads

V. UNCLASSIFIABLE THOUGHTS

Thoughts that cannot be unambiguously classified into any of the preceding categories.

CLASSIFICATION BASED ON VALENCE OF THOUGHT

A positive valence will be assigned for thoughts that are judged to be favorable toward either the ad or the brand based on the following criteria:

1. Such favorability may be inferred directly when the thought explicitly makes a positive statement about the ad or brand. For example, "It seems to have all the features."

2. Such favorability may also be inferred indirectly when the thought makes a positive statement about any issue that can be construed to have favorable implications for that person's attitude toward the ad or brand. For example, "I probably can afford it."

In assigning a negative valence, similar criteria will be used to judge unfavorability. When the thought provides no indication whatsoever of favorability or unfavorability, no valence (i.e., neutral) will be assigned.
CLASSIFICATION BASED ON ORIGIN OF THOUGHT

A. Message-Originated Thoughts

Statements that are direct quotes, paraphrases, or restatements of ad content. The source of the information contained in message-originated thoughts should be traceable directly to ad content.

Examples: Alarm system
Soon as alarm goes off monitors call police
Priced reasonable
Professionally installed

B. Modified Message-Originated Thoughts

Statements that are reactions to, elaborations, qualifications, or illustrations of the information in the ad. The content of such statements, although traceable directly to ad content, would represent modifications of such ad content.

Examples: The product should be quite useful (effective)
Reasonably priced! To what? ...indicate price/comparison
Probably cheap quality
Maybe we should have a burglar alarm in our house

C. Receiver-Generated Thoughts

Statements about the brand that are not traceable directly to ad content.

Examples: Could it be disconnected easily?
Not sure if the product would be efficient
Will I have to spend an arm and a leg to get all the bells and whistles for the thing?
Wonder if they do fire department alerting also

D. Unclassifiable Thoughts

Thoughts that cannot be classified unambiguously into any of the preceding categories.
CLASSIFICATION BASED ON LEVEL OF ABSTRACTION OF THOUGHT

A. Factual Details

Statements that playback ad content. Such statements contain virtually no modification of ad content.

Examples: Panic button with a 9 digit code
           Shunt feature
           Professionally installed by ISSA 5-steps
           All the doors and windows closed to activate the alarm

B. Single-Fact Interpretations

Statements representing the subjective interpretation of individual attributes. Such statements preserve the gist of a claim made in the ad, but are less specific than factual details.

Examples: How much?
           Thought Guardian was an appropriate name
           7 seconds seemed like a short amount of time
           Single sensors – not great

C. Abstractions

Statements that summarize or generalize specific attributes. These are judgements about, or inferences from, one or more explicit or implicit facts [thus, even thoughts about a single attribute could be classified here, as long as they elaborate in some way beyond ad content]. Also included here are thoughts referring to individual attributes not appearing in the ad.

Examples: Advanced
           The features included ones I would be interested in having
           Desirable features
           Would I be able to get by the system if it were installed?
D. Global Evaluations

Statements of overall judgment - expressing general evaluative reactions to the product as a whole. They are not specific to particular features or dimensions of the product. This category includes statements of intention toward the product.

Examples:  Good to have
           It is worth considering for my brand search
           Parents should have one
           I don't believe that I need a security system

E. Unclassifiable Thoughts

Thoughts that cannot be classified unambiguously into any of the preceding categories.
## Table 1
Cognitive Response Coding – Reliability Estimates

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Number of Categories</th>
<th>Number of Thoughts</th>
<th>Percentage Agreement</th>
<th>(I_r) estimate of reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1(^a)</td>
<td>5</td>
<td>1102</td>
<td>0.91</td>
<td>0.94</td>
</tr>
<tr>
<td>Level 2(^b)</td>
<td>3</td>
<td>953</td>
<td>0.97</td>
<td>0.98</td>
</tr>
<tr>
<td>Valence</td>
<td>3</td>
<td>953</td>
<td>0.94</td>
<td>0.95</td>
</tr>
<tr>
<td>Origin</td>
<td>4</td>
<td>484</td>
<td>0.90</td>
<td>0.93</td>
</tr>
<tr>
<td>Abstraction</td>
<td>5</td>
<td>484</td>
<td>0.81</td>
<td>0.87</td>
</tr>
</tbody>
</table>

\(^a\) Classified as either ad-related, brand-related, irrelevant unclassifiable, or relating to the longitudinal knowledge manipulation.

\(^b\) Classified as either ad/brand-related, overall ad evaluation, or overall brand evaluation.
Table 2
Cell Means for Manipulation Checks

<table>
<thead>
<tr>
<th>Measure</th>
<th>LOW INVOLVED -CLAIMS</th>
<th></th>
<th>LOW INVOLVED +CLAIMS</th>
<th></th>
<th>HIGH INVOLVED -CLAIMS</th>
<th></th>
<th>HIGH INVOLVED +CLAIMS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NOVICE</td>
<td>HK</td>
<td>NOVICE</td>
<td>HK</td>
<td>NOVICE</td>
<td>HK</td>
<td>NOVICE</td>
</tr>
<tr>
<td>Processing Involvement</td>
<td>-0.97</td>
<td>0.20</td>
<td>-0.32</td>
<td>0.23</td>
<td>1.68</td>
<td>1.81</td>
<td>1.24</td>
</tr>
<tr>
<td>Total Ad Thoughts</td>
<td>1.86</td>
<td>2.12</td>
<td>2.77</td>
<td>1.76</td>
<td>1.73</td>
<td>2.64</td>
<td>2.17</td>
</tr>
<tr>
<td>Total Brand Thoughts</td>
<td>0.82</td>
<td>1.33</td>
<td>1.23</td>
<td>0.90</td>
<td>2.95</td>
<td>3.50</td>
<td>2.83</td>
</tr>
<tr>
<td>Claim Recall</td>
<td>0.46</td>
<td>2.88</td>
<td>1.50</td>
<td>2.72</td>
<td>4.95</td>
<td>7.75</td>
<td>5.08</td>
</tr>
<tr>
<td>Non-Claim Recall</td>
<td>1.46</td>
<td>2.08</td>
<td>2.32</td>
<td>1.83</td>
<td>2.68</td>
<td>2.14</td>
<td>2.42</td>
</tr>
<tr>
<td>Claim Evaluation</td>
<td>0.59</td>
<td>0.68</td>
<td>1.14</td>
<td>1.31</td>
<td>1.22</td>
<td>-0.05</td>
<td>1.73</td>
</tr>
<tr>
<td>Support Arguments</td>
<td>0.21</td>
<td>0.29</td>
<td>0.41</td>
<td>0.62</td>
<td>1.14</td>
<td>0.43</td>
<td>1.42</td>
</tr>
<tr>
<td>Counterarguments</td>
<td>0.57</td>
<td>0.96</td>
<td>0.68</td>
<td>0.10</td>
<td>1.68</td>
<td>2.93</td>
<td>0.96</td>
</tr>
<tr>
<td>Multi-attribute Index a</td>
<td>38.4</td>
<td>46.2</td>
<td>71.6</td>
<td>120.3</td>
<td>79.2</td>
<td>-24.9</td>
<td>124.8</td>
</tr>
<tr>
<td>Price Estimation</td>
<td>$787</td>
<td>$391</td>
<td>$985</td>
<td>$1041</td>
<td>$629</td>
<td>$421</td>
<td>$796</td>
</tr>
<tr>
<td>Price Willing To Pay</td>
<td>$477</td>
<td>$293</td>
<td>$529</td>
<td>$694</td>
<td>$433</td>
<td>$228</td>
<td>$502</td>
</tr>
<tr>
<td>Self-Reported Knowledge</td>
<td>-1.85</td>
<td>1.32</td>
<td>-1.32</td>
<td>1.16</td>
<td>-1.27</td>
<td>1.20</td>
<td>-1.20</td>
</tr>
<tr>
<td>Objective Knowledge b</td>
<td>3.50</td>
<td>6.83</td>
<td>3.23</td>
<td>7.38</td>
<td>3.64</td>
<td>6.82</td>
<td>3.58</td>
</tr>
<tr>
<td>n</td>
<td>28</td>
<td>24</td>
<td>22</td>
<td>29</td>
<td>22</td>
<td>28</td>
<td>24</td>
</tr>
</tbody>
</table>

a Scale ranges from -288 to +288  
b Scale ranges from 0 to 10
Table 3
Manipulation Checks
F-values for 2x2x2 ANOVAS

<table>
<thead>
<tr>
<th>Measure</th>
<th>Main Effects</th>
<th>Interactions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Involvement (I)</td>
<td>Argument Strength (A)</td>
</tr>
<tr>
<td>Processing Involvement</td>
<td>81.1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-</td>
</tr>
<tr>
<td>Total Ad Thoughts</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total Brand Thoughts</td>
<td>56.8&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-</td>
</tr>
<tr>
<td>Claim Recall</td>
<td>112.4&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-</td>
</tr>
<tr>
<td>Non-Claim Recall</td>
<td>6.6&lt;sup&gt;c&lt;/sup&gt;</td>
<td>-</td>
</tr>
<tr>
<td>Support Arguments</td>
<td>19.3&lt;sup&gt;a&lt;/sup&gt;</td>
<td>9.7&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Counterarguments</td>
<td>31.1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>19.3&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Claim Evaluation</td>
<td>1.9</td>
<td>34.3&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Multi-attribute Index</td>
<td>-</td>
<td>55.7&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Price Estimation</td>
<td>1.5</td>
<td>21.7&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Price Willing To Pay</td>
<td>-</td>
<td>14.6&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Self-Reported Knowledge</td>
<td>1.5</td>
<td>-</td>
</tr>
<tr>
<td>Objective Knowledge</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<sup>a</sup> p < .001,  <sup>b</sup> p < .01,  <sup>c</sup> p < .05,  <sup>d</sup> p < .1; blank cells represent F<1
Table 4
Cell Means for Abstraction and Valence of Thought Measures

<table>
<thead>
<tr>
<th>Measure</th>
<th>LOW INVOLVEMENT</th>
<th>HIGH INVOLVEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-CLAIMS</td>
<td>+CLAIMS</td>
</tr>
<tr>
<td></td>
<td>NOVICE HK NOVICE HK</td>
<td>NOVICE HK NOVICE HK</td>
</tr>
<tr>
<td>Factual Details</td>
<td>0.00 0.17</td>
<td>0.00 0.17</td>
</tr>
<tr>
<td>Single-Fact Interpretations</td>
<td>0.57 0.67</td>
<td>0.45 0.14</td>
</tr>
<tr>
<td>Abstractions</td>
<td>0.25 0.54</td>
<td>0.77 0.59</td>
</tr>
<tr>
<td>Global Evaluations</td>
<td>0.29 0.33</td>
<td>0.55 0.31</td>
</tr>
<tr>
<td>Valenced Ad Thoughts</td>
<td>-0.82 -0.67</td>
<td>-0.41 -0.52</td>
</tr>
<tr>
<td>Valenced Brand Thoughts</td>
<td>-0.36 -0.67</td>
<td>-0.27 0.52</td>
</tr>
</tbody>
</table>
Table 5  
Abstraction and Valence of Thought  
F-values for 2x2x2 ANOVAS

<table>
<thead>
<tr>
<th>Measure</th>
<th>None</th>
<th>Argument Strength (A)</th>
<th>Knowledge (K)</th>
<th>Interactions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Involvement (I)</td>
<td></td>
<td></td>
<td>IxA</td>
</tr>
<tr>
<td>Factual Details</td>
<td>2.5</td>
<td>-</td>
<td>1.3</td>
<td>-</td>
</tr>
<tr>
<td>Single-Fact Interpretations</td>
<td>22.3^a</td>
<td>8.4^b</td>
<td>2.1</td>
<td>-</td>
</tr>
<tr>
<td>Abstractions</td>
<td>39.2^a</td>
<td>2.0</td>
<td>1.4</td>
<td>-</td>
</tr>
<tr>
<td>Global Evaluations</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Valenced Ad Thoughts</td>
<td>-</td>
<td>-</td>
<td>1.2</td>
<td>2.7</td>
</tr>
<tr>
<td>Valenced Brand Thoughts</td>
<td>2.2</td>
<td>27.2^a</td>
<td>2.1</td>
<td>6.8^b</td>
</tr>
</tbody>
</table>

^a p < .001, ^b p < .01, ^c p < .05, ^d p < .1; blank cells represent F<1
Table 6
Cell Means for Origin of Thought and Structured Scale Measures

<table>
<thead>
<tr>
<th>Measure</th>
<th>LOW INVOLVEMENT</th>
<th></th>
<th>HIGH INVOLVEMENT</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-CLAIMS</td>
<td>+CLAIMS</td>
<td>-CLAIMS</td>
<td>+CLAIMS</td>
</tr>
<tr>
<td></td>
<td>NOVICE  HK</td>
<td>NOVICE  HK</td>
<td>NOVICE  HK</td>
<td>NOVICE  HK</td>
</tr>
<tr>
<td>Message-Originated Thoughts</td>
<td>0.00   0.17</td>
<td>0.00    0.17</td>
<td>0.32  0.18</td>
<td>0.12  0.42</td>
</tr>
<tr>
<td>Modified Message-Originated Thoughts</td>
<td>0.82   1.17</td>
<td>1.14    0.66</td>
<td>2.32  3.25</td>
<td>2.54  2.23</td>
</tr>
<tr>
<td>Recipient-Generated Thoughts</td>
<td>0.00  0.04</td>
<td>0.09    0.07</td>
<td>0.27  0.07</td>
<td>0.12  0.08</td>
</tr>
<tr>
<td>Valenced Message-Modified-Message-Originated Thoughts</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00  0.00</td>
<td>0.27  0.04</td>
</tr>
<tr>
<td>Valenced Recipient-Generated Thoughts</td>
<td>-0.36  -0.67</td>
<td>-0.23   0.52</td>
<td>-0.55  -2.54</td>
<td>0.54  0.23</td>
</tr>
<tr>
<td>Brand Attitude</td>
<td>0.13  0.33</td>
<td>0.74    1.25</td>
<td>0.65  -0.98</td>
<td>1.14  1.51</td>
</tr>
<tr>
<td>Confidence in Self-Rating of Knowledge</td>
<td>5.95  5.48</td>
<td>5.52    5.55</td>
<td>6.05  5.61</td>
<td>5.42  5.79</td>
</tr>
<tr>
<td>Confidence in Brand Evaluation</td>
<td>5.98  5.22</td>
<td>5.64    5.57</td>
<td>6.09  6.09</td>
<td>5.83  5.87</td>
</tr>
<tr>
<td>Product Involvement&lt;sup&gt;a&lt;/sup&gt;</td>
<td>85.2   99.9</td>
<td>86.5    101.1</td>
<td>95.1  105.4</td>
<td>102.8 100.7</td>
</tr>
</tbody>
</table>

<sup>a</sup> Scale ranges from 20 to 140
Table 7
Origin of Thought and Structured Scales
F-values for 2x2x2 ANOVAS

<table>
<thead>
<tr>
<th>Measure</th>
<th>Main Effects</th>
<th>Interactions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Involvement (I)</td>
<td>Argument Strength (A)</td>
</tr>
<tr>
<td>Message-Originated Thoughts</td>
<td>2.9&lt;sup&gt;d&lt;/sup&gt;</td>
<td>-</td>
</tr>
<tr>
<td>Modified Message-Originated Thoughts</td>
<td>50.6&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1.5</td>
</tr>
<tr>
<td>Recipient-Generated Thoughts</td>
<td>3.9&lt;sup&gt;c&lt;/sup&gt;</td>
<td>-</td>
</tr>
<tr>
<td>Valenced Message-Originated Thoughts</td>
<td>3.8&lt;sup&gt;d&lt;/sup&gt;</td>
<td>-</td>
</tr>
<tr>
<td>Valenced Modified Message-Originated Thoughts</td>
<td>4.2&lt;sup&gt;c&lt;/sup&gt;</td>
<td>35.0&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Valenced Recipient-Generated Thoughts</td>
<td>3.0&lt;sup&gt;d&lt;/sup&gt;</td>
<td>-</td>
</tr>
<tr>
<td>Brand Attitude</td>
<td>-</td>
<td>47.7&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Confidence in Self-Rating of Knowledge</td>
<td>-</td>
<td>1.1</td>
</tr>
<tr>
<td>Confidence in Brand Evaluation</td>
<td>4.5&lt;sup&gt;c&lt;/sup&gt;</td>
<td>-</td>
</tr>
<tr>
<td>Product Involvement</td>
<td>4.6&lt;sup&gt;c&lt;/sup&gt;</td>
<td>-</td>
</tr>
</tbody>
</table>

<sup>a</sup> p < .001,  <sup>b</sup> p < .01,  <sup>c</sup> p < .05,  <sup>d</sup> p < .1; blank cells represent F<1
Table 8
Brand and Ad Thoughts Explaining Brand Attitude: Regression Analyses

<table>
<thead>
<tr>
<th>Dependent Measure</th>
<th>Condition</th>
<th>Brand Thoughts</th>
<th>Ad Thoughts</th>
<th>F</th>
<th>p</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>β</td>
<td>t</td>
<td>p</td>
<td>β</td>
<td>t</td>
</tr>
<tr>
<td>High Involvement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brand Attitude</td>
<td>Novice</td>
<td>0.53</td>
<td>4.1</td>
<td>.001</td>
<td>0.10</td>
<td>0.8</td>
</tr>
<tr>
<td></td>
<td>HK</td>
<td>0.71</td>
<td>7.1</td>
<td>.001</td>
<td>0.22</td>
<td>2.2</td>
</tr>
<tr>
<td>Low Involvement</td>
<td>Novice</td>
<td>0.10</td>
<td>0.7</td>
<td>.48</td>
<td>0.38</td>
<td>2.8</td>
</tr>
<tr>
<td></td>
<td>HK</td>
<td>0.51</td>
<td>4.3</td>
<td>.001</td>
<td>0.19</td>
<td>1.6</td>
</tr>
</tbody>
</table>
Table 9
Simple Correlations of Brand and Ad Thoughts with Brand Attitude

<table>
<thead>
<tr>
<th>Involvement</th>
<th>Predictor</th>
<th>HK</th>
<th>Novice</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>Brand Thoughts</td>
<td>0.67&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.55&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>High</td>
<td>Ad Thoughts</td>
<td>0.11</td>
<td>0.23&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td>Low</td>
<td>Brand Thoughts</td>
<td>0.55&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.20&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td>Low</td>
<td>Ad Thoughts</td>
<td>0.29&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.41&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a</sup> p < .001,  <sup>b</sup> p < .01,  <sup>c</sup> p < .05,  <sup>d</sup> p < .1;
### Table 10
Regression Analyses for Origin of Thought

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Dependent Measure</th>
<th>Condition</th>
<th>Ad Thoughts</th>
<th>M-O Thoughts</th>
<th>M-M-O Thoughts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>(\beta)</td>
<td>(t)</td>
<td>(p)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(p)</td>
<td>(t)</td>
<td>(p)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High Involvement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Novice</td>
<td>0.08</td>
<td>0.6</td>
<td>.53</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HK</td>
<td>0.23</td>
<td>2.3</td>
<td>.02</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Low Involvement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Novice</td>
<td>0.39</td>
<td>2.8</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HK</td>
<td>0.21</td>
<td>1.7</td>
<td>.09</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>* Variable was constant in this cell</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Note— M-O: Message Originated Thoughts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M-M-O: Modified Message-Originated Thoughts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 11
Simple Correlations of Origin of Thought Indices with Brand Attitude

<table>
<thead>
<tr>
<th>Involvement</th>
<th>Predictor</th>
<th>HK</th>
<th>Novice</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>Message-Originated Thoughts</td>
<td>0.11</td>
<td>0.19(^d)</td>
</tr>
<tr>
<td>High</td>
<td>Modified Message-Originated Thoughts</td>
<td>0.71(^a)</td>
<td>0.58(^a)</td>
</tr>
<tr>
<td>Low</td>
<td>Message-Originated Thoughts</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Low</td>
<td>Modified Message-Originated Thoughts</td>
<td>0.52(^a)</td>
<td>0.20(^d)</td>
</tr>
</tbody>
</table>

* Variable was constant in this cell

\(^a\) p < .001, \(^b\) p < .01, \(^c\) p < .05, \(^d\) p < .1;
Table 12
Confidence as a Mediator of Origin of Thought Effects:
Regression Analyses

<table>
<thead>
<tr>
<th>Dependent Measure</th>
<th>Confidence</th>
<th>M-M-O Thoughts</th>
<th>β</th>
<th>t</th>
<th>p</th>
<th>F</th>
<th>p</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Novice</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brand Attitude</td>
<td>Low</td>
<td></td>
<td>0.38</td>
<td>3.2</td>
<td>.002</td>
<td>10.2</td>
<td>.002</td>
<td>14.7%</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td></td>
<td>0.49</td>
<td>3.3</td>
<td>.001</td>
<td>10.6</td>
<td>.003</td>
<td>24.4%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HK</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brand Attitude</td>
<td>Low</td>
<td></td>
<td>0.58</td>
<td>5.9</td>
<td>.001</td>
<td>34.6</td>
<td>.001</td>
<td>34.0%</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td></td>
<td>0.72</td>
<td>6.2</td>
<td>.001</td>
<td>38.6</td>
<td>.001</td>
<td>52.4%</td>
</tr>
</tbody>
</table>

Note— M-M-O: Modified Message-Originated Thoughts
Table 13
Product Knowledge, Product Involvement, and Processing Involvement:
Lisrel Results

<table>
<thead>
<tr>
<th>Path</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>PK —&gt; PI</td>
<td>.18&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.17&lt;sup&gt;b&lt;/sup&gt;</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PI —&gt; INV</td>
<td>.45&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.43&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-</td>
<td>.42&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.42&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>PK —&gt; INV</td>
<td>-</td>
<td>.11</td>
<td>.19&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.11</td>
<td>.11</td>
</tr>
<tr>
<td>PI —&gt; PK</td>
<td>-</td>
<td>-</td>
<td>.18&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.17&lt;sup&gt;b&lt;/sup&gt;</td>
<td>-</td>
</tr>
<tr>
<td>PK &lt;--&gt; PI</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>.17&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

Fit Statistics

<table>
<thead>
<tr>
<th></th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi square</td>
<td>3.18</td>
</tr>
<tr>
<td>Degrees of freedom</td>
<td>2</td>
</tr>
<tr>
<td>p-value</td>
<td>.20</td>
</tr>
<tr>
<td>Adjusted GFI</td>
<td>.97</td>
</tr>
<tr>
<td>Root mean square residual</td>
<td>.05</td>
</tr>
</tbody>
</table>

Chi square 3.18 .93 33.34 .93 1.8

Degrees of freedom 2 1 2 1 2

p-value .20 .34 .001 .34 .40

Adjusted GFI .97 .98 .72 .98 .98

Root mean square residual .05 .04 .16 .04 .06

Note— PK: Product Knowledge
PI: Product Involvement
INV: Processing Involvement
See Figure 3 for Models A – E

<sup>a</sup> p < .01, <sup>b</sup> p < .05
Terminology
Knowledge of meanings of terms used within a domain. For example, knowing that “pronation” refers to heels that turn in while running.

Product Attributes
Knowledge of which attributes are available for evaluating a brand. Includes knowledge of attributes that a person would use in making a decision and also those that s/he would not use but is aware of their existence. For example, the statement “Some people consider lightweight essential in a new running shoe” indicates knowledge of the attribute “weight” whether or not the individual thinks this a relevant attribute for her/his own decision making.

General Attribute Evaluation
Knowledge of the overall evaluation for an attribute or an attribute level, e.g., “I like waffle soles” or “I don’t like a heavy shoe.”

Specific Attribute Evaluation
Knowledge of criteria used to evaluate an attribute, i.e., cut-off points or reference points used to judge how satisfactory an attribute level is, e.g., “I won’t spend more than 30 dollars.” It also refers to how an attribute (or a specific level of an attribute) is related to other attributes and/or performance criteria, e.g., “A lightweight shoe doesn’t last very long.”

General Product Usage
Knowledge of how the product can be used, what characteristics of the usage situation are relevant when a purchase is being considered, and which product characteristics are affected by these usage situation characteristics. Included in this category are normative rules for usage, e.g., “You should not wear running shoes to play tennis,” and knowledge of how the product class can be categorized based on usage, e.g., “There are several types of running shoes: competition shoes, training shoes, track shoes, and cross-country shoes.”

Personal Product Usage
Includes memories of one’s own and others’ usage experiences, and knowledge of the salient characteristics of one’s own and others’ usage situations. For example, “I don’t run long distances” or “My sister once wore out a pair in three weeks.”

Brand Facts
Knowledge of how brands “score” on an attribute, overall evaluations of a brand, and other brand facts such as comparisons between brands on an attribute. Examples are “I would never wear Adidas” or “Adidas have an antimicrobial sole.”

Purchasing/Decision Making Procedures
Knowledge about the purchasing process. Included are memories of personal purchase experiences and also normative models of the purchase process. An example of the former is “I bought my last pair of shoes from Mitchell’s Attic.” An example of normative knowledge is “You shouldn’t buy the first thing you see.”

Figure 1
Brucks’ (1986) Typology of Product Knowledge
<table>
<thead>
<tr>
<th>Claim</th>
<th>Strong Substantiation</th>
<th>Weak Substantiation</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROFESSIONALLY INSTALLED!</td>
<td>Our trained and certified staff will install your alarm system using the 5-step procedure recommended by ISSA.</td>
<td>Freelance installers will evaluate your needs and choose appropriate methods of installation.</td>
</tr>
<tr>
<td>ADVANCED SENSORS!</td>
<td>Our R&amp;D department has designed the GUARDIAN system to incorporate only dual sensors.</td>
<td>Our R&amp;D department has designed the GUARDIAN system to incorporate only single sensors.</td>
</tr>
<tr>
<td>ALARM MONITORING SERVICE!</td>
<td>Your GUARDIAN system is linked to our monitoring service. The instant an alarm is triggered, we initiate the call-back scheme.</td>
<td>Your GUARDIAN system is linked to our monitoring service. The instant an alarm is triggered, we call the police.</td>
</tr>
<tr>
<td>ENTRY/EXIT DELAY!</td>
<td>GUARDIAN's entry/exit delay system is adjustable from 15 to 60 seconds.</td>
<td>GUARDIAN's system gives you a 7 second entry/exit delay.</td>
</tr>
<tr>
<td>PANIC BUTTON!</td>
<td>GUARDIAN's alarm can be activated simply by pressing a button on a remote control device.</td>
<td>GUARDIAN's panic button is installed on the system's control unit and uses a 9-number digital code to activate the alarm.</td>
</tr>
<tr>
<td>SHUNT FEATURE!</td>
<td>GUARDIAN's shunt feature can restrict the alarm to selected doors.</td>
<td>GUARDIAN's shunt feature activates the alarm only when all windows and doors are closed.</td>
</tr>
<tr>
<td>REASONABLY PRICED!</td>
<td>Our nationwide distribution network sells as many alarms systems as the competition. Our prices are competitive.</td>
<td>Same as the strong version (see text).</td>
</tr>
<tr>
<td>EXTRA FEATURES!</td>
<td>GUARDIAN's built-in extra features include touch tone remote control and temperature/moisture sensors.</td>
<td>GUARDIAN offers you extra features to choose from – such as other types of single sensors and an indoor alarm.</td>
</tr>
</tbody>
</table>

Figure 2
Claims and Substantiation Copy
Figure 3
Plots of Interaction Effects
Figure 3 (continued)

(g) High Involvement

(h) Low Involvement

(i)

(j) Valenced M-M-O Thoughts
MODELS A & B

MODELS C & D

MODEL E

Note—Models B and D differ from A and C in the inclusion of a direct path from Product Knowledge/Involvement to Processing Involvement.

Figure 4
Lisrel Models
H1a: HK subjects counterargued the weak claims more than novices, but did not generate more support arguments relative to novices when exposed to the strong claims.

H1b: HK subjects generated more single-fact interpretations than novices, but only when the claims were weak. No difference was observed for abstractions.

H2a,b: HK subjects were more likely than novices to rely on their brand thoughts in forming evaluations. Novices were more likely to rely on their ad thoughts, but only under low involvement.

H3a: HK subjects' valenced brand thoughts became more negative than that of novices when exposed to the weak claims. HK subjects and novices did not differ within the strong claims condition.

H3b: HK subjects' brand attitude was more negative than that of novices when exposed to the weak claims. HK subjects and novices formed similar attitudes within the strong claims condition.

H4a: HK subjects reported more modified message-originated thoughts than novices, but only when the claims were weak.

H4b: HK subjects were more likely to rely on their modified message-originated thoughts in forming brand evaluations.

H5: Knowledge did not increase confidence as measured in this study. However, confidence was shown to enhance the ability of modified message-originated thoughts to mediate brand attitude. Further, this was true for HK subjects, and not novices.

H6: Involvement moderated the effects described above in H1a, H1b, H2b, H3b, H4a, and H4b. The effects in H2a and H3a persisted under low involvement.

H7a,b: Knowledge was shown to enhance product involvement, which in turn increased processing motivation. Product involvement mediated the effect of knowledge on processing motivation.

Figure 5
Summary of Findings