Understanding How Elderly Patients Process Drug Information: A Test of a Theory of Information Processing

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Purpose. The goal of this research was to apply a well-known model of consumer behavior, the Elaboration Likelihood Model (ELM), to "direct-to-consumer" advertising of prescription drugs aimed at elderly consumers. In particular, the specific aim was to determine whether the effect of promotional aspects of consumer drug advertising predicted by the ELM could be demonstrated on elderly consumers' product attitudes and perceptions of risk.

Methods. Subject reaction to a fictitious drug advertisement was assessed using a 2 × 2 × 2 factorial design based on the theoretical concepts of the ELM. The advertisement message varied in the expertise of the product endorser, the expected involvement or interest level of the study subject, and the content of the advertisement message.

Results. Analysis of variance revealed a three-way interaction effect between involvement, argument quality, and source credibility on subjects' attitudes toward the product [$F(1, 123) = 4.77$, $p = 0.03$] and perceptions of risk [$F(1, 118) = 3.22$, $p = 0.08$]. The information content of the ads had an impact on subject's attitudes under the low involvement/low credibility condition but not the low involvement/high credibility condition. Under high involvement conditions, the information content of the ad impacted attitudes under both the high and low credibility conditions.

Conclusions. It appears that the ELM may be a useful model for determining when elderly individuals are more likely to be influenced by the information content or the promotional aspects of consumer advertisements for prescription drugs.

KEY WORDS: advertising; prescription drugs; consumer behavior; elaboration likelihood model; risk perception.

INTRODUCTION

Since the late 1960's there has been an emphasis in public policy toward making drug information more widely available to the public (1–2). A relatively recent example is the Food and Drug Administration's regulatory stance on "direct-to-consumer" advertising of prescription drugs. Initially, pharmaceutical manufacturers' practice of advertising their prescription products directly to the public created quite a bit of controversy (3). However, after declaring a short moratorium on consumer advertising of prescription drugs, the FDA realized that the mass media had potential as an alternative method of informing the public about the risks and benefits of prescription drugs. The FDA decided to allow the practice of consumer advertising of prescription drugs, provided the advertisements contained a "fair balance" of risk information.

Despite the FDA decision to allow drug manufacturers to advertise their prescription products directly to consumers, controversial issues surrounding consumer advertising of prescription drugs remain (4). Proponents of consumer drug advertising claim that the advertising increases patient awareness of the existence of disease, availability of treatment, and potential side effects associated with specific drugs. The claimed overall effect of increased patient awareness is greater patient participation in drug therapy decisions and risk assessment. Further, proponents claim that greater patient participation in drug therapy decisions might lead to better compliance with prescribed drug regimens.

Those opposed to consumer advertising of prescription drugs claim detrimental health effects. They believe consumers' limited understanding of risk and susceptibility to the promotional aspects of drug advertising will induce them to put pressure on physicians to prescribe inappropriately. Further, the opposition believes physicians will respond to this pressure causing stimulated drug misuse in an over-medicated society.

The greatest impact of direct-to-consumer advertising, whether favorable or not, is likely to occur in the elderly population. The elderly consume more prescription drugs and are a financially attractive market segment (5). Therefore, they are a prime target for drug promotion. The elderly are also in the greatest need of drug information. A number of age-related physiologic effects make the elderly more susceptible to adverse drug effects (6). Thus, the risk information contained in consumer drug advertisements may benefit the elderly. There is concern, however, that information processing deficits in the elderly may make them more susceptible to the promotional aspects of drug advertising; lending support to arguments of stimulated drug misuse (7).

The arguments favoring and opposing direct-to-consumer advertising fit well into two general theoretical approaches to explaining the underlying processes of persuasive communications: central and peripheral route approaches. Central route approaches explain attitude change or persuasion as a result of individuals giving careful and thoughtful consideration to the information or arguments presented in a persuasive appeal (8–11). Peripheral route approaches explain persuasion or attitude change as a process that can occur relatively independent of the information or arguments presented in a persuasive appeal. Instead, individuals rely on cues in the message context and simple heuristics or decision rules to form attitudes (12–14).

The Elaboration Likelihood Model of Persuasion (ELM) is a general model of attitude change that integrates central and peripheral route approaches to explaining the underlying processes of a persuasive communication (15–18). Importantly, the ELM explains how individual and situational differences among consumers determine when information content or promotional aspects of an advertisement are more likely to influence attitudes. For example, according to the ELM, a highly involved individual (one who finds a product in an advertisement personally relevant) is more likely to scrutinize the product-relevant information presented in an advertisement. If the information is perceived to be cogent and persuasive (a strong

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argument), favorable attitudes will result. If the information is weak and specious (a weak argument), less favorable attitudes will result (central route processing).

On the other hand, a lesser involved person will not spend the effort required to think about the product-relevant information or arguments contained in an advertisement. Instead, the individual is likely to focus on contextual cues such as the credibility or prestige of a product endorser (peripheral route processing). If a product endorser appears credible, favorable attitudes will result. A less credible product endorser will generate less favorable attitudes (19).

The developers of the ELM conducted a number of experiments examining how individual and situational differences determine when an individual will engage in careful argument processing (central route processing) or rely on peripheral cues (peripheral route processing) (20–22). The ELM postulates a tradeoff between argument processing and the operation of peripheral cues. When argument scrutiny is reduced, peripheral cues become relatively more important determinants of attitude change. When argument scrutiny is increased, peripheral cues become relatively less important. Thus, the general plan for examining when individuals will engage in central or peripheral route processing usually involves establishing two kinds of persuasion contexts: one in which the likelihood of argument elaboration is relatively high (e.g., high involvement) and one in which the likelihood of elaboration is low (e.g., low involvement).

The hypothesis to be tested is that attitudes are determined primarily by argument quality when elaboration likelihood is high (central route processing) but primarily by peripheral cues when elaboration likelihood is low (peripheral route processing). The evidence for central route processing is generally a significant interaction effect between involvement and argument quality. Under high involvement conditions strong arguments generate significantly more favorable attitudes whether a message contains a credible or less credible source. Similarly, evidence for peripheral route processing is generally a significant interaction effect between involvement and source credibility. Under low involvement conditions, messages that contain a more credible source generate more favorable attitudes whether the arguments in the message were strong or weak.

Although the application to consumer drug advertising in an elderly population is novel, the present study replicates previous research on the ELM by examining involvement as a moderator of central and peripheral route processing. When involvement is high, central route processing is more likely to occur. When involvement is low, peripheral route processing is more likely to occur. The reported results are useful in determining whether the ELM is a useful model for determining when information content (central route processing) or promotional aspects (peripheral route processing) of direct-to-consumer advertising are more likely to influence elderly individuals.

MATERIALS AND METHODS

Subjects and Design

A total of 131 elderly male and female subjects were recruited from the University of Michigan Geriatric Research and Training Center Human Subject Core and a local senior citizen apartment complex. Selection criteria included: 1) 60 years of age or over; 2) ability to communicate effectively with researchers; 3) adequate literacy skills; 4) no obvious vision impairment; 5) no apparent cognitive impairment; and 6) living independently. To select subjects meeting the criteria, the investigators relied on the administrators of the Human Subject Core. In 1992, the Human Subject Core recruited approximately 2,000 adults as volunteers for aging-related research projects. Registry information on volunteers is updated annually and includes basic demographic, ability to participate, and health related information to be used as selection criteria in forming subject groups for particular research projects. For the senior citizen complex, background data was not available. Thus, the activities director of the complex was asked to identify individuals meeting the selection criteria.

The study plan involved randomly assigning subjects to each of the experimental conditions in a two (high or low involvement) by two (strong or weak arguments) by two (high or low source credibility) factorial design and exposing them to an advertisement for a fictitious prescription nonsteroidal anti-inflammatory (NSAID) drug. The fictitious ad varied in the expertise of the product endorser, the expected interest level of the study subject, and the content of the advertisement message. The ad was presented to subjects in a booklet along with two other advertisements. After reviewing the advertisements, subjects responded to a set of questions measuring their attitudes toward the fictitious product and their perception of the product's risk.

Data Collection Procedure

Data collection occurred during eleven study sessions over a two-month period. The number of subjects attending each session ranged from two to 23. An appropriate number of test packets containing an informed consent form, advertisement booklet, and questionnaire were prepared for each study session. Each study packet represented one of the eight experimental conditions. Prior to each study session, test packets were randomly distributed throughout the room. High and low source credibility conditions were kept on opposite sides of the room since this was the only obvious difference between test packets. The room position of high and low source credibility packets was alternated at each session. Upon entering the room, subjects were instructed to sit wherever they found a study packet.

At the beginning of each session, subjects were asked to read and sign the informed consent form. They were instructed that they would have ten minutes to view the advertisement booklet. After ten minutes, the advertisement booklet would be collected and they could begin the questionnaire. Subjects were informed that the questionnaire was self-directed and they were free to leave after completing the questionnaire. Upon leaving, subjects were debriefed, reimbursed for parking or cab fare and were given a token gift (a medication information booklet published by the United States Pharmacopoeia).

Independent Variables

The independent variables were created by manipulating the three experimental conditions: involvement, argument quality and source credibility. This section describes the operationalization of these variables.

Involvement

The involvement manipulation was accomplished by strategically placing instruction information in the advertisement booklet. The general cover story for the experiment was that various government agencies interested in prescription drug advertising had contacted the College of Pharmacy and the School of Business to assist them in evaluating consumer advertisements for prescription drugs. The high and low involvement group cover stories varied in the importance of individual opinion to the agency requesting assistance and in the future availability of the advertised drug. On the cover page of the advertising booklet subjects were informed either that:

> Various government agencies responsible for regulating prescription drug advertising have asked the College of Pharmacy and School of Business Administration at the University of Michigan to assist them in the development of guidelines for approving consumer advertising for prescription drugs.
>
> The following pages contain prototype advertisements currently under various stages of approval at the responsible agencies. Your individual opinions will weigh heavily in decisions currently being made by these agencies about how best to inform the public of these new products. Thus, your opinions will have great bearing on the success or failure of these advertisements, as well as future public policy concerning the regulation of prescription drug advertising. (High Involvement)
>
> or
>
> Various government agencies interested in prescription drug advertising have asked the College of Pharmacy and School of Business Administration at the University of Michigan to assist them in evaluating consumer opinion about advertising for prescription drugs.
>
> The following pages contain several advertisements for prescription drugs directed toward consumers. These advertisements have either already run or are not expected to run in the near future. Thus, your opinion will have no bearing on the success or failure of the advertisements. But, the agencies are interested in responses from people. Because all responses will be averaged, each individual opinion will not count for very much. The agencies are interested in broad trends in opinion. (Low Involvement)

To enhance the involvement manipulation, the following lead-ins for the ad were placed on a sheet preceding presentation of the ad:

> The following page is an advertisement for Dirovin, a prescription drug for the treatment of arthritis. Dirovin is a new product just approved by the Food and Drug Administration (FDA). Dirovin will be available upon prescription as early as this fall. The advertisement on the next page is one submitted to the appropriate government agencies for approval and hopes to run in this area. (High Involvement)
>
> or
>
> The following page is an advertisement for Dirovin, a prescription drug for the treatment of arthritis. Dirovin has not been approved by the Food and Drug Administration and will not be available in the United States in the foreseeable future. The advertisement on the next page is a prototype developed by the marketing department at Hayes Pharmaceuticals. (Low Involvement)

Argument Quality

The argument quality manipulation was included in the text of the advertisement. A large number of beneficial product claims and risk information regarding non-steroidal, anti-inflammatory drugs (NSAID) was generated by reviewing advertisements for NSAID products in various medical journals. The arguments were used to generate messages containing both beneficial product claims and risk information.

The beneficial product claims focused on effectiveness (e.g., ". . . effective in fighting arthritic pain."), gentleness (e.g., ". . . coating. . . helps reduce stomach upset.") and convenience (e.g., ". . . taken only once a day."). These were concepts that were repeatedly emphasized in advertisements for NSAID products found in medical journals. Beneficial product claims were held constant across all versions of the advertisement. The argument quality of the advertisement was manipulated by varying the severity of the risk information contained in the advertisement. The risk information appeared in the lower right corner of the ad under the heading, "Side effects should be considered." Subjects received one of the following risk messages:

> Side effects should be considered. Dirovin may cause a serious allergic reaction called anaphylaxis. In some cases this has been fatal. Be sure to tell your doctor if you are allergic to any medications.
>
> Other serious side effects such as stomach or intestinal bleeding, ulceration and perforation may occur with or without warning during long-term use of Dirovin. Confusion, forgetfulness, mental depression, and other mental and mood changes have also been reported with Dirovin use. (Weak message/High risk)
>
> or
>
> Side effects should be considered. Only your doctor can tell if Dirovin is right for you. Be sure to tell your doctor if you are allergic to any medications.
>
> Along with its intended effects, Dirovin may cause unwanted effects. Many are minor, such as heartburn, indigestion, constipation or diarrhea. However, if you notice any unusual reactions or side effects, check with your doctor or pharmacist. (Strong message/Low risk)

To be consistent with regulatory requirements, the back side of each version of the ad displayed detailed consumer information about Dirovin. This type of information is typically found in prescription advertising directed toward the consumer. The information was developed from existing advertising for NSAIDs in medical journals and information contained in the United States Pharmacopoeial Convention, Inc. publication: *USP DI Advice for the Patient.*

Source Credibility

The source credibility manipulation was accomplished by placing a color picture of an ad spokesperson in the top-center of the ad. The variation in source credibility was based on perceived expertise. In the high credibility version of the ad, the spokesperson was seated at a desk wearing a white coat. The spokesperson was identified as: Dr. Robert Hild, Chief of Rheumatology, Johns Hopkins Medical Center. In the low source credibility version of the ad, the spokesperson was seated at a desk in shirtsleeves and suspenders. The spokesperson was identified as: Bob Hild, General Contractor, Bakersfield, California. Underneath each picture the statement: "Dirovin

works for me" appeared. In order to avoid differences in physical attractiveness and likeability, one male model posed for both the high and low credibility versions.

Prior to conducting the study, a pretest of the study instruments was conducted at a local chapter meeting of the American Association of Retired Persons (AARP). The purpose of the pretest was to assess the logistics of the experiment and check experimental manipulations. After completing the experiment, a debriefing session was held. In general, subjects indicated that the manipulations were plausible and the instructions were understood.

Measures to Assess Experimental Manipulations

Three measurement scales (involvement, argument quality, and source credibility) were included to assess whether the various experimental manipulations had their intended effects.

Involvement

To assess the effect of the involvement manipulation, an involvement index was constructed. The index included answers to the query: "With respect to your interest while reading the Dirovin advertisement, were you. . . ?" Three items were used to capture the reactions: not involved-involved, not interested-interested, and not motivated-motivated. The response to each item was recorded on a nine-point scale. The responses to items were averaged to produce an index score reflecting extent of involvement.

Argument Quality

The argument quality manipulation was assessed through a thought-listing technique. Subjects were provided with the following instructions:

> IN THE BOXES PROVIDED BELOW, PLEASE LIST ALL THE THOUGHTS, REACTIONS, AND IDEAS THAT WENT THROUGH YOUR MIND while you were reading the Dirovin advertisement. Write down everything that you thought of regardless of whether it pertained to the product, the advertisement or anything else. There are no right or wrong answers. Don't worry about grammar, spelling or punctuation. Remember, list all thoughts that occurred to you during the time you were looking at the advertisement. (One thought per box, please.)

Ten boxes were placed after the instructions to list thoughts.

Two types of thoughts were of interest: those directed toward the product and those directed toward the advertisement. Occasionally there was a third type of thought (classified in the "other" category) that was directed toward neither the product nor the advertisement. In addition to the type of thought, it was important to know whether the thoughts were positive, negative or neutral. In order to capture both dimensions of interest, a dual coding scheme was employed. Each thought was coded with a letter indicating whether the thought was directed toward the product (P), advertisement (A), or was listed as other (O) and each thought was also given a numeric code indicating whether the thought was positive (+1), neutral (0) or negative (−1).

Source Credibility

The source credibility manipulation was checked by asking subjects to respond to the following statement: "The spokesperson used in the Dirovin advertisement was. . . " followed by six items with seven-point semantic differential scales. The items were anchored as follows: undependable-dependable, unreliable-reliable, untrustworthy-trustworthy, not an expert-expert, unknowlegable-knowledgable, unqualified-qualified. Responses to the items were averaged to produce an index score reflecting perceptions of source credibility.

Dependent Variable Measures

Two attitude measures were included as dependent variables: attitude toward the product and perceived risk.

Attitude Toward the Product

Attitude toward the product was included as a measure of subject's favorable or unfavorable attitudes toward the advertised prescription drug. Attitude toward the product is probably the most important dependent variable to marketing researchers when conducting ELM-based advertising studies, especially since attitude toward the product is considered an important antecedent to purchasing intentions and behaviors (23).

Attitude toward the product was measured with the query: "What is your overall impression with the *prescription drug product* Dirovin? Please respond to this question with your overall impression of the *product*, and not with your impression of the advertisement for the product." Attitudes were measured on six items: bad-good, unsatisfactory-satisfactory, unfavorable-favorable, unpleasant-pleasant, negative-positive, and ineffective-effective. The response to each item was measured on a seven point semantic differential scale. The responses to items were then averaged to produce an attitude toward the product score.

Perceived Risk

Perceived risk was included in this study as a measure of the risk to which subjects believed they might be exposed through use of the advertised prescription drug. Perceived risk is not commonly used as a dependent variable in ELM-based studies. However, the issue of how direct-to-consumer advertising influences individual perception of risk is the essence of public policy surrounding the practice. Further, differences in perceived risk are likely to result from differences in routes to persuasion. Therefore, perceived risk was included as a dependent variable in much the same way that more general attitude change measures usually serve as dependent variables in ELM-based studies. Perceived risk was measured with a single query: "Please judge how risky to your health using Dirovin would be?" Subjects' reactions were measured by a single item using a seven-point response scale. The anchors for the scale were: "No Risk at All" and "Extremely High Risk."

RESULTS

Manipulation Checks

Prior to testing the study hypotheses, source credibility, involvement and argument quality manipulation checks were

conducted. Individual scores on the appropriate scales were averaged for each group receiving a particular level of a treatment. Group scores between the two levels of a treatment were then compared via one-way analysis of variance. If the difference in scores was statistically significant, it was concluded that the intervention had its intended effect.

Involvement

The average of the items measuring involvement while viewing the Dirovin ads indicated that subjects exposed to high involvement conditions perceived the task to be more interesting than subjects exposed to low involvement conditions (mean score = 5.22 versus mean score = 4.89). However, the difference in means was not statistically significant [$F(1, 129) = 1.26$; $p = 0.26$]. Thus, the different introductions to the advertisements were not successful in creating different levels of involvement in the subjects.

Argument quality

The average of the thought listing scores indicated that subjects viewing the weak argument (high risk) ads generated significantly more unfavorable thoughts than subjects viewing the strong argument (low risk) ad [mean score = -1.2 versus mean score = -0.2; $F(1, 127) = 4.16$, $p = 0.04$]. Thus, varying the argument quality in the advertisements did have the intended effect.

Source Credibility

Finally, the average of the items measuring the credibility of the spokesperson in the Dirovin ads showed that the physician spokesperson was rated significantly more credible than the general contractor [mean score = 5.35 versus mean score = 4.40; $F(1, 126) = 15.35$, $p = 0.0001$]. These results show that varying the credibility of spokesperson resulted in a different response from subjects.

Attitude Toward the Product and Perception of Risk

Subjects' mean scores for each experimental condition on the attitude toward the product and perceived risk measure are displayed in Figures 1 and 2, respectively. The effects of the various experimental conditions were assessed by analysis of variance.

Attitude Toward the Product

Several interesting main effects emerged on the attitude toward the product measure. First, more involved subjects generated somewhat more favorable attitudes toward the product (mean score = 4.44) than lesser involved subjects [mean score = 3.90; $F(1, 123) = 3.31$, $p = 0.07$]. Second, subjects favored the product more when the ad contained strong (low risk) arguments (mean score = 4.58) than when the arguments were weak (high risk) [mean score = 3.76; $F(1, 123) = 7.65$, $p = 0.01$]. Although subjects exposed to the low source credibility endorser had slightly more favorable product attitudes (mean score = 4.37) than subjects exposed to the high source credibility endorser (mean score = 3.98), the difference was not statistically significant [$F(1, 123) = 1.78$, $p = 0.19$].

The main effects on subjects' attitude toward the product must be qualified and interpreted in the light of an important three-way interaction between involvement, argument quality and source credibility [$F(1, 123) = 4.77$, $p = 0.03$]. An analysis of the simple interaction effects showed that there was a statistically significant simple interaction effect between argument quality and source credibility under low involvement conditions [$F(1, 123) = 13.2$, $p = 0.01$] but not high involvement conditions [$F(1, 123) = 0.86$, $p = 0.36$]. Under low involvement conditions, argument quality had a significant impact only when the advertisement contained the low credibility product endorser [$F(1, 123) = 6.29$, $p = 0.01$], not the high credibility product endorser [$F(1, 123) = 0.31$, $p = 0.57$].

Perceived Risk

A similar pattern of main effects emerged for the perceived risk measure. Subjects exposed to the strong argument (low risk) advertisement had significantly more favorable risk perceptions (mean score = 3.76) than subjects exposed to the weak argument (high risk) advertisement [mean score = 2.94; $F(1, 118) = 15.54$, $p = 0.00$]. Likewise, subjects had significantly more favorable risk perceptions when exposed to an advertisement containing the non-physician product endorser (mean score = 3.61) than when exposed to the advertisement containing the physician product endorser [mean score = 3.09; $F(1, 118) = 6.22$, $p = 0.01$]. However, highly involved subjects (mean score = 4.85) had only slightly more favorable risk perceptions than lesser involved subjects [mean score = 4.40; $F(1, 118) = 1.87$, $p = 0.17$].

As with attitudes toward the product, the main effects on subjects' risk perceptions must be qualified and interpreted in light of a three-way interaction between involvement, argument quality and source credibility which only approached statistical significance [$F(1, 118) = 3.22$, $p = 0.08$]. A simple interaction effect between argument quality and source credibility on subjects' risk perceptions nearly emerged under low involvement conditions [$F(1, 118) = 2.48$, $p = 0.09$] but not under high involvement conditions [$F(1, 118) = 1.01$, $p = 0.53$]. Under low involvement conditions, argument quality had a significant impact when the advertisement contained the low credibility product endorser [$F(1, 118) = 10.53$, $p = 0.01$], but not the high credibility product endorser [$F(1, 118) = 1.42$, $p = 0.30$].

DISCUSSION

It was hypothesized that argument quality would have a greater impact on attitude formation under high involvement conditions and that source credibility would have a greater impact on attitude formation under low involvement conditions. Upon analysis, a statistically significant three-way interaction effect between involvement, argument quality and source credibility on the attitude toward the product measure was revealed. The same three-way interaction effect approached statistical significance on the perceived risk measure. This three-way interaction provides some evidence supporting central route processing under high involvement conditions and peripheral route processing under low involvement conditions.

A three-way interaction occurs when the simple interaction effects of two variables are not the same at different levels of the third variable. On both the attitude toward the product

(Figure 1, lower panel) and perceived risk (Figure 2, lower panel) measures, argument quality appears to have an impact on subjects' attitudes when exposed to low involvement/low credibility conditions, but argument quality does not have an impact under low involvement/high credibility conditions (a simple interaction effect between source credibility and argument quality). Under high involvement conditions, argument quality appears to have an impact under both high and low source credibility conditions on the attitude toward the product (Figure 1, upper panel) and perceived risk (Figure 2, upper panel) measures (no simple interaction effect between source credibility and argument quality).

The lack of a simple two-way interaction between source credibility and argument quality under high involvement conditions is consistent with studies examining the tradeoffs between argument scrutiny and the operation of peripheral cues under high involvement conditions (20–22). If only central route processing were occurring, however, one would expect simple main effects to be present for argument quality and no simple main effects to be present for source credibility. This was not the case, however. A statistically significant simple main effect for argument quality was present under the high involvement, high source credibility condition but not the high involvement, low source credibility condition. This phenomenon occurred on both the attitude toward the product and perceived risk measure. Furthermore, though there were no statistically significant simple main effects for source credibility on the attitude toward the product measure, there was a statistically significant main effect for source credibility under the high involvement, weak argument quality condition on the perceived risk measure.

The presence of a simple two-way interaction between source credibility and argument quality under low involvement conditions is somewhat inconsistent with studies examining the tradeoffs between argument scrutiny and the operation of peripheral cues under extremely low involvement conditions (20–22). However, the results are somewhat consistent with studies examining the effects of argument quality and source credibility under moderate or ambiguous involvement conditions (24,25).

In studies examining the effects of argument quality and source credibility under ambiguous involvement conditions, argument quality has been shown to have a greater impact when messages are attributed to more attractive or expert sources. Attractive or expert sources tend to enhance agreement with proposals when the arguments presented are strong, but reduce agreement when the arguments presented are weak. Argument quality does not have a significant impact on attitudes when the source is unattractive or not an expert (24,25).

In the present study, the simple interaction effect between argument quality and source credibility under low involvement

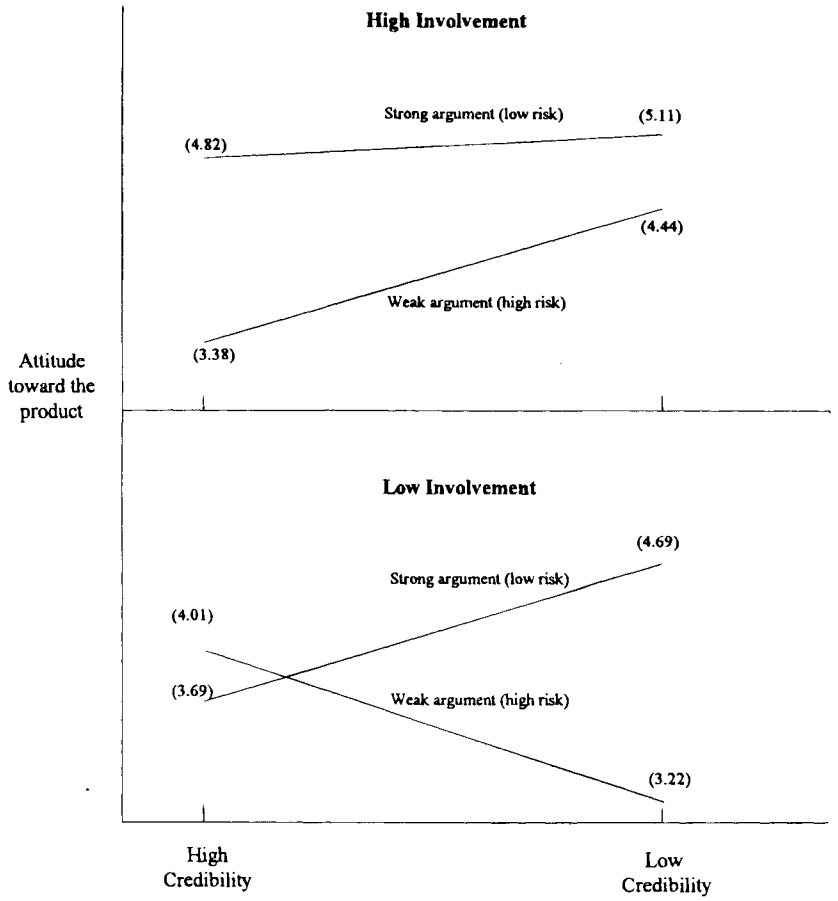

Fig. 1. Displays the subjects' mean scores on the attitude toward the product measure (vertical axis) for each treatment cell. Attitude toward the product was measured on a seven point scale (1 = Extremely unfavorable, 7 = Extremely favorable). Mean scores for each treatment cell are in parentheses.

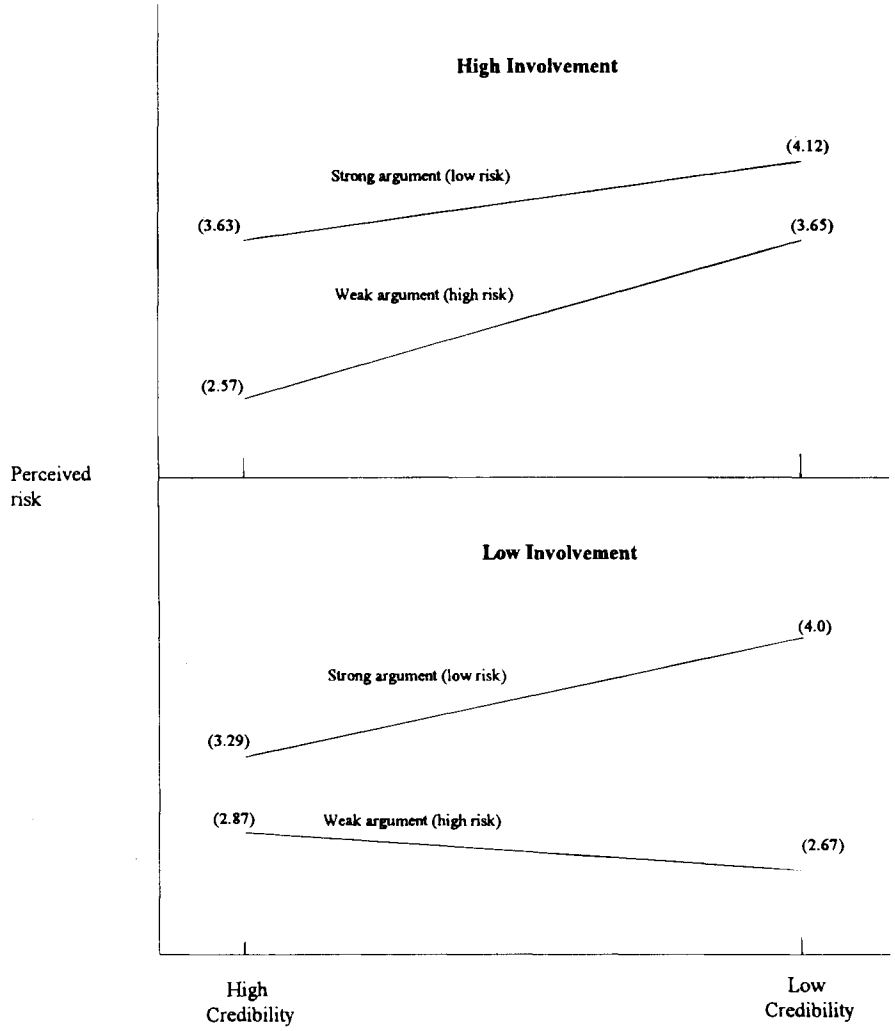

Fig. 2. Displays the subjects mean scores on the perceived risk measure (vertical axis) for each treatment cell. Perceived risk was measured on a seven point scale (1 = No risk at all, 7 = Extremely high risk). The scale is reversed in the figure to be consistent with scales in the other figures. Mean scores for each treatment cell are in parentheses.

conditions on the attitude toward the product (Figure 1, lower panel) and perceived risk (Figure 2, lower panel) measures is very similar to the interaction effect between argument quality and source cues in experiments where involvement is left ambiguous. It is likely that these findings may be due to a failure to create extreme conditions of involvement. That is, a situation may have been created where involvement in one group of individuals was extremely high while involvement in the other group was moderate or ambiguous rather than extremely low.

There is some evidence supporting a failure to create extreme involvement conditions in this study. When mean involvement index scores were compared between the high and low involvement groups, subjects in the high involvement group rated their involvement higher, but there was no statistical difference between the high and low involvement groups. Further, most subjects were drawn from the Human Subject Core. Members of the Human Subject Core have indicated a previous willingness to participate in studies. Therefore, there may have been some inherent level of involvement in this group which could be made higher, but not lower.

There is a difference in the simple interaction effect between source credibility and argument quality under low involvement conditions in the present study and studies examining the interaction effect between source credibility and argument quality under ambiguous involvement conditions. Under ambiguous involvement conditions, argument quality has been shown to have an impact under high credibility conditions. In the present study, argument quality had an impact under low credibility conditions (Figures 1 and 2, lower panels). An explanation of the seemingly conflicting results may be that subjects were distrustful of a physician endorsing a prescription drug product. If subjects were suspicious of a physician endorser, this may have interrupted the information processing. This explanation is plausible given the subjects were elderly. Older subjects may be more distrustful because of past misleading information they have received from 'expert' sources.

An explanation of results based on a failure to create extreme levels of involvement (high and low) appears to be consistent with the ELM. According to Postulate 3 of the ELM, variables such as source credibility can affect persuasion by serving as arguments, cues, or by affecting argument processing.

Classic tests of the ELM tend to focus on how source credibility operates when the overall elaboration likelihood, the effort a person will spend evaluating a communication, is either very high (no or little impact) or very low (peripheral cues). Conclusions about the impact of source credibility under conditions of high and low elaboration likelihood, however, are only part of the explanation of how source credibility impacts persuasion. Elaboration likelihood is a continuum anchored at one end by the peripheral route to persuasion, and at the other end by the central route to persuasion.

Results of the present study appear to be consistent with an explanation that elaboration likelihood was extremely high under one condition (high involvement) and moderate or ambiguous under the other condition (low involvement). Previous studies have shown that source credibility impacts attitude change by affecting message processing under ambiguous elaboration conditions. The simple interaction effect between source credibility and argument quality under what was termed "low involvement" conditions in this experiment were consistent with effects revealed under ambiguous elaboration conditions. Furthermore, the effect disappears under the high involvement condition.

CONCLUSIONS

This study provides some evidence that situational differences, such as different levels of involvement, may determine whether elderly individuals are more likely to give careful consideration to information presented in an advertisement or to be influenced by the promotional aspects of the advertisement. Direct-to-consumer advertising may be useful in developing wiser users of medications and providing a stronger basis for patient participation in drug therapy decisions if elderly individuals are motivated to process the information. However, there is still reason to be concerned. If elderly consumers are less motivated, the basis of their attitudes and actions may not be determined by a careful consideration of drug information. Practitioners should be aware of the possibility of different avenues of influence when communicating with elderly patients exposed to direct-to-consumer advertising. In discussing patient preferences for a particular drug, practitioners should assure themselves that their patients have given careful consideration to the potential benefits and risks associated with a particular drug. This consideration is especially important because the patient preferences may be significantly influenced by mass media sources such as advertising.

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