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The Impact of Side-Effects Information in Direct-to-Consumer Prescription Drug Advertising on Consumers' Product Attitudes: The Information Processing Perspective

Jia Lu
THE IMPACT OF SIDE-EFFECTS INFORMATION IN DIRECT-TO-CONSUMER PRESCRIPTION DRUG ADVERTISING ON CONSUMERS’ PRODUCT ATTITUDES: THE INFORMATION PROCESSING PERSPECTIVE

By

JIA LU

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The members of the Committee approve the thesis of
Jia Lu defended on July 9th, 2007.

Laura Arpan
Professor Directing Thesis

Arthur Raney
Committee Member

Juliann Cortese
Committee Member

Approved:

Stephen McDowell, Chair, Department of Communication

John Mayo, Dean, College of Communication

The Office of Graduate Studies has verified and approved the above named committee members.
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ABSTRACT

This study investigated whether personality differences (i.e., personal need for structure [PNS] and personal fear of invalidity [PFI]) would interact with the type of risk information in Direct-to-consumer advertising (DTCA) of prescription drugs to influence participants’ attitudes toward the ad and brand via differences in processing of the content of the ads.

Results for both high PNS and low-PNS participants suggested that their attitudes toward the brand were influenced by their global attitudes toward DTCA, while their attitudes toward the ad were not affected by their global attitudes. For participants with higher personal fear of invalidity, their attitudes toward the brand were also correlated with their global attitudes toward DTCA. For low-PNS participants, attitudes toward the brand were influenced by the type of risk information. The analyses also indicated that for participants who seemed to engage in the central route (careful) processing (i.e., low PNS), attitudes toward the drug were more favorable among participants presented with mild (vs. severe) risk information.
INTRODUCTION

Direct-to-consumer advertising (DTCA) of prescription drugs has grown dramatically in the past several years. Expenditures for DTCA increased from an estimated $380 million in 1995 to nearly $4.24 billion in 2005 (Morgan, 2007). However, DTCA is controversial. On the one hand, some findings indicate that DTCA can dramatically promote drug sales (Basara, 1996). Some research suggests that DTCA provides consumers with useful information and helps them to be more intelligently involved in their own medical treatment (Calfee, 2002). On the other hand, some researchers argue that DTCA is not intended to educate patients, but is simply aimed at increasing sales (Auton, 2006). The review of literature implies that there is insufficient empirical evidence to support either position. Systematic research is needed to evaluate the merits and problems associated with DTCA.

Given that different advertising strategies can lead to extremely different results, it is vital to explore the impacts of specific DTCA on consumers’ product attitudes. Additionally, previous research revealed that different DTCA contained various types of risk information. Therefore, it is vital to address the effects of risk information on consumers’ attitudes toward the ad and product. Furthermore, research indicates that information processing is of great importance to the formation of product attitudes. Different people under particular situations are motivated to search and assess various amounts and types of information.

Through experimental design, this study examined which information processing routes people may use to make judgments about DTCA and whether variations of side-effects information in DTCA affect consumers’ attitudes toward the ad and product.
LITERATURE REVIEW

Previous Research on Direct to Consumer Advertising

Direct to consumer advertising (DTCA) is defined as “any promotional effort by a pharmaceutical company to present prescription drug information to the general public through the lay media (i.e., newspapers, periodicals, television, and radio)” (Bradley & Zito, 1997). The influences of DTCA have attracted the attention of researchers from a variety of academic fields. Most of the research has explored consumers’ global attitudes toward DTCA, as well as the relationship between attitudes and behavior. There is, however, no simple consensus on the effects of DTCA. Some researchers have suggested that such advertising is beneficial because it educates patients about the choices available in the treatment, helps patients recognize the symptoms of medical conditions, encourages consumers to see doctors, enhances patient-doctor relationships, and improves patients’ compliance with drug therapy (Auton, 2006; Calfee, 2002; Wilkes, Bell, & Kravitz, 2000). Some researchers have argued that most of the information appearing in the DTCA is unbalanced, which may mislead consumers; other researchers also have contended that DTCA may undermine the doctor/patient relationship, and even stimulate inappropriate prescribing (Wilkes, Bell, & Kravitz, 2000). Yet others have maintained that since DTCA contains both promotional and public protection purposes, its merits and demerits (mentioned above) coexist (Auton, 2006). All sides lack reliable data to support these claims.

FDA’s Regulations and Content Analysis of DTCA

According to the 1997 Food and Drug Administration (FDA) draft guidance, prescription drug advertisements cannot be false or misleading, or violate any regulations and guidelines (Davis, 2000). DTCA that mention the drug’s name and usage (“product-specific advertisements”) must present a “fair balance” of risk and benefit information, include a “major statement” of a product’s important risk information, and present such information relevant to indications and risks in “consumer friendly” language (Calfee, 2002; Kaphingst, Dejong, Rudd & Daltroy, 2004). Additionally, print advertisements must include all risks mentioned in the product’s approved labeling, while radio and television advertisements are not required to disclose detailed risk
information if they refer consumers to sources (e.g., toll-free phone numbers, web sites, print DTCA, physicians) for more complete information (Nikam, 2003; Calfee, 2002). Further, in 2004 the FDA issued new guidance for print advertisements, requiring advertising to use language and formats that can more clearly communicate risk information (Huh & Cude, 2004).

Although the FDA regulations of prescription drug advertisements emphasize the “fair balance” aspect, previous research examining the content of DTCA showed that some ads did not comply with the FDA guidelines. Some important information was omitted, and some risk information was often presented in a vague manner. Wilkes et al. (1999) conducted a content analysis of DTCA appearing in diverse general consumer magazines and found that, except for the name of the condition treated by the marketed drug and the symptom information for that particular condition, potentially valuable information was rarely provided. For instance, only 27% of the DTCA mentioned causes of the disease, 12% mentioned prevalence information, and 9% clarified condition-related myths or misconceptions.

A content analysis of DTCA on the Web (Huh & Cude, 2004), showed that even though most prescription drug websites presented information on the drug’s effectiveness and potential side effects, they failed to meet the FDA’s fair balance requirements. Specifically, only half the websites provided both types of information in their homepages, and about one-half of websites provided risk information in a smaller font size than they used for benefit information. Through an examination of the content of nine pharmaceutical company websites, Graber and Weckmann (2002) came to a similar conclusion: The information about drugs on these websites was limited, impeding consumer comparison of and choice among drugs.

After content analyzing twenty-three direct-to-consumer television prescription drug advertisements broadcast during 2001, Kaphingst et al. (2004) concluded that most DTCA appearing on television allotted much more time to benefits rather than to side-effects information about drugs. Also, risk information was only presented with positive and neutral visual images. In addition, these ads only gave complete references to additional product information textually rather than vocally. As a result, whether DTCA provided consumers with detailed and balanced product information is still in doubt.

In summary, although most DTCA provide consumers with both benefit and risk information, some have failed to present a balance between these two types of information. Most pharmaceutical companies provide incomplete information of a drug’s potential risks, and
typically inform consumers about mild rather than severe side-effects. They even try to distract consumers’ attention from risk information by emphasizing benefit information (e.g. using larger font size, when listing a drug’s benefit information on the company’s homepage).

This raises the question of whether different kinds of side-effects information can greatly influence individuals’ judgments. The answer to this question not only can help the FDA decide whether stricter regulations are needed, but also can help advertisers better understand how risk information affects perceptions of their products.

**Effects of Benefit and Risk Information in DTCA**

Whether risk and benefit information in DTCA influence consumers’ attitude toward marketed drugs is still open to debate. A limited number of empirical researchers have examined the impact of risk information in television and magazine prescription drug advertisements on consumer awareness, knowledge, and attitudes (David, 2000; Morris, Mazis & Brinberg, 1989; Morris, Ruffner & Ronald, 1985; Morris et al., 1986; Nikam, 2003). For example, Morris, Ruffner, and Ronald (1985) evaluate the effects of variations in amount, specificity and emphasis of risk information on consumers’ *global reactions* to DTCA. The results indicated that the DTCA that included no risk information led to the most positive evaluation of the advertised drug, but were considered as the most uninformative ads. The ads that emphasized specific risk information or integrated general warnings without special emphasis were viewed as more “irritating” than other ads were. Morris (1986) examined how various sources, amount, specificity and emphasis of risk information in DTCA affected consumers’ *global attitudes* toward DTCA. The study found that participants tended to have more positive attitudes toward ads integrating risk information than they did toward ads giving special emphasis to the risk material. Additionally, television advertising was found to enhance drug information-seeking, while magazine advertising led to stronger views of patient authority in health care decision making. Morris, Mazis, and Brinberg (1989) assessed the impact of various amount, specificity and format of risk information in television prescription advertisements on consumers’ *awareness and knowledge* of both the warnings and the promotional messages. Results suggested that a larger amount of risk information produced greater risk awareness, and specific risk information was more effective in increasing knowledge about drug risks than general risk information. Also, David (2000) indicated that the safety and appeal of drugs described with an incomplete risk statement were significantly
more positively viewed than were comparable drugs described with a more complete risk statement. Nikam (2003) found that participants presented with general risk statements held more favorable attitudes toward the advertised drug than did those exposed to specific risk statements. In conclusion, participants tend to favor the DTCA that contained general warnings, incomplete risk statements or integrated risk information.

Moreover, some research suggested that while consumers valued both risk and benefit information, the perception of risk information had greater influence on consumers’ attitudes toward the utility of DTCA than the perception of benefit information (Deshpande et al, 2004). Furthermore, Schomme, Doucette, and Mehta (2003) suggested that the presentation of both benefit and side-effects information in the same television prescription drug advertisement can cause retention problems of both types of information.

In sum, the research suggested that changes in the presentation of risk information and benefit information influenced consumer awareness and knowledge of, and attitudes toward DTCA and advertised drugs. Yet, none of the research mentioned above took information processing into account. Individuals may apply various cognitive approaches to judgment making even if they are presented with the same advertising. For example, psychological differences between individuals may be one of the factors that influence information processing. Individuals with certain characteristics may base their judgments toward specific advertising on their global attitudes towards DTCA, while some other individuals may examine the ad thoroughly before making any judgments. There is a paucity of studies applying the Elaboration Likelihood Model (ELM) to examine the different impacts of risk and benefit information in DTCA; these have produced some interesting but inconclusive results. The ELM provides a general framework for understanding the persuasive communication process. The ELM suggests that not only situational stimuli (e.g., personal involvement) but also individual differences (e.g., need for cognition) can serve as motivational factors in information processing (Buterfield & Welbourne, 2002; Petty & Cacioppo, 1986). Therefore, it is predicted that other personality variables such as personal need for structure and personal fear of invalidity may also exert significant influence on persuasion process. These two variables are derived from another cognitive approach model: lay epistemic theory (Kruglanski, 1983, 1990, 1996).

The purpose of this study is to explore whether personality differences will interact with the type of information to influence consumer attitudes toward specific DTCA via differences in
processing of the content of ads. The following section will briefly review the ELM and then discuss the lay epistemic theory in detail.

**Theoretical Base**

**Elaboration Likelihood Model**

According to the ELM, attitude change may occur through one of two different processing routes: the central route or the peripheral route (Chaiken & Trope, 1999). *Central route processing* is characterized by careful evaluation of the arguments contained in a message. In contrast, *peripheral route processing* induces attitude change based on heuristics -- derived either from existing knowledge or from previous experience -- that are not closely related to the actual merits of the message. Myriad simple cues such as the credibility of the speaker, gestures of the communicator, or background music could be considered as heuristics.

A person’s motivation and ability to examine a message in detail should determine whether he or she would engage in central or peripheral processing (Petty & Cacioppo, 1986). Personal involvement is an important motivational factor. If individuals are *highly* involved in an issue (i.e., they consider that the issue is of great importance to their lives), they attend to and evaluate the message by the arguments provided, and thus engage in central processing. If individuals are *low* in involvement (i.e., they perceive that an issue is irrelevant to their lives), they are less motivated to think carefully about a decision, tend to search for as little information as possible, and may rely on heuristic cues to make judgments. For example, when an individual is presented with a DTCA, and he or she considers the ad to be relevant to his or her life (e.g., some family member is sick and may need the drug advertised), the individual may attend to and scrutinize such message arguments as benefit information and risk information. If, however, he or she perceives that the ad has nothing to do with his or her own life (e.g., all of the family members are healthy), then the individual may base judgments on pictures or source credibility, or may ignore the ad completely. Other motivational factors like personal need for cognition may also impact message processing (Petty & Cacioppo, 1986).

Ability also influences the likelihood of elaboration. Both cognitive ability and situational factors can constrain or enhance an individual’s ability to process a message centrally (Petty &
Cacioppo, 1986). First, situational factors can lead to different levels of elaboration likelihood. For instance, a noisy environment can distract an individual’s attention and limit one’s ability to evaluate the arguments of a message. Second, individual differences also determine whether a central or a peripheral route is pursued. Specifically, previous knowledge may determine the extent to which individuals are able to elaborate. People with great knowledge of an issue can understand message arguments quite well, while people with little knowledge lack the capacity to scrutinize messages and have no choice but to engage in peripheral processing of the message.

The ELM has been applied to the DTCA field and has revealed some interesting findings. Recall that the ELM indicates that people’s previously formed attitudes can be considered as heuristic cues. Thus, in the DTCA context people’s global attitudes toward DTCA could be perceived as heuristic cues, while risk and benefit information contained in the ad can be viewed as message arguments. Therefore, it is predicted that for individuals processing information heuristically, their global attitudes toward DTCA could have great impacts on their attitudes toward specific advertising, whereas for individuals who are motivated and have the ability to systematically analyze messages, the risk and benefit information may exert significant effects. Previous studies provide limited support for this proposal.

Everett (1989) suggested that variations in amount and format of risk information have different influences on low-knowledge readers and high-knowledge readers. According to Everett, low-knowledge readers perceived greater risk to themselves as the complexity of the risk information increased, though high-knowledge readers were unaffected. High-knowledge readers, however, thought more about the product as their attitudes toward the ad grew more positive, an effect not found among low-knowledge readers (Everett, 1989). Research conducted by Christensen (1996) also showed a three-way interaction effect between source credibility, involvement and argument quality on perceptions of risk and attitudes toward drugs. Under high-involvement conditions, participants presented with strong argument (low risk) messages perceived less risk and formed more favorable product attitudes than did participants presented with weak argument quality (high risk) messages. Under low involvement conditions, participants presented with strong argument quality (low risk) messages also formed more favorable product attitudes and considered the product to be less dangerous, but only when the spokesperson was less credible (Christensen, 1996). That is to say, the source with low credibility may motivate participants in low involvement situations to engage in central routes, carefully examine message
arguments, and base their product attitudes on the merits of the argument.

None of the studies mentioned above, however, took personal differences between consumers into account. Is there an interaction effect between individual characteristics and information type on individual attitudes toward DTCA? Does personality also interact with a previously formed attitude to influence persuasion process? Is it possible that those people who have the inner tendency to search and assess as much information as possible may pay more attention to risk information than those who want to quickly arrive at their conclusions? The ELM and the previous research cannot answer those questions.

Compared with the ELM, the theory of lay epistemology (Kruglanski & Freund, 1983) outlines a similar but broader view of the knowledge acquisition process and provides a more detailed analysis of the motivational factors – both situational factors and personal differences – of information processing, thus offering a better theoretical base for above-mentioned questions. According to Kruglanski (1990), “The lay epistemic analysis features a unified view of attitude change stressing the fundamental commonalities between central and peripheral route to attitude change” (p. 189).

Lay Epistemic Theory

Lay epistemic theory concerns the formation and modification of human knowledge. The theory addresses how people attach meaning to stimuli in a situation, and suggests that this knowledge acquisition process is dependent upon an individual’s ability to systematically examine the existing data and one’s motivation to do so.

The epistemic sequence. The process of lay epistemics involves two stages: hypothesis generation and hypothesis validation (Kruglanski, 1980; Kruglanski & Freund, 1983). In the hypothesis generation stage, the individual generates alternative propositions on some topic; in the hypothesis validation stage, the individual deduces implications from alternative propositions and tests them against the appropriate evidence. Therefore, after being exposed to a stimulus, individuals generate hypotheses associated with this stimulus, validate the hypotheses, and stop the information searching and hypothesis testing processes when a desirable conclusion has been achieved.

Hypothesis validation is assumed to be based on preexisting inference rules that, in the knower’s mind, connect given categories of evidence with given hypotheses (Kruglanski, 1990).
Such linkages could be “logical,” “probabilistic,” or “statistical” in form (Kruglanski, 1990, p.181). For instance, in the statement “A large amount of red meat in the diet leads to heart disease,” the amount of red meat serves as relevant evidence for a “heart disease” inference. In reality, individuals may consider one or several inference rules in testing a certain hypothesis (Kruglanski, 1990).

The hypothesis generation stage depends on individual cognitive capability and epistemic motivation, both of which will be discussed in detail below.

**Cognitive capability.** According to Kruglanski and Freund (1983), a person’s capacity to generate hypotheses on a given topic relates to the availability of the requisite knowledge and the momentary accessibility of the subset of the knowledge. Assuming that an individual is asked to evaluate a DTCA, one’s capacity to generate relevant hypotheses is based on the set of DTCA concepts stored in his or her long term memory (availability) – for example, his or her global attitude toward the DTCA or previous medication knowledge (e.g., knowledge about the safe use of prescription drugs) -- and the accessibility of these concepts, the extent to which they can be retrieved easily from memory.

**Motivation.** An individual’s motivation to generate hypotheses on a topic can be classified into four categories: (1) need for a specific closure; (2) need for a nonspecific closure; (3) avoidance of nonspecific closure, and (4) avoidance of a specific closure. The need for closure refers to “individual’s desire for a firm answer to a question and an aversion toward ambiguity” (Kruglanski & Webster, 1996, p.264). In other words, people under need for closure tend to terminate the knowledge seeking process, stop generating alternative hypotheses, and reach a definite conclusion. In contrast, people who wish to avoid closure tend to desire ambiguity, generate alternative hypotheses, and pay attention to inconsistent evidence. Nonspecific closure is defined as “definite knowledge on a given topic, irrespective of the particular content of such knowledge” (Kruglanski, 1990, p. 182). In other words, nonspecific closure has nothing to do with individuals’ existing beliefs and attitudes. Individuals who need nonspecific closure desire for any judgment or decision as long as ambiguity can be avoided. Specific closure means “knowledge with some special properties (e.g. esteem-enhancing, or optimistic contents)” (p.182). For instance, both a specific attitude toward a product and a particular answer to a question could be considered specific closure. The need for a specific closure refers to the preference for a definite judgment of a particular content that is consistent with one’s previous attitudes and beliefs (Kruglanski, 2003).
Take a lawsuit as an example. Both the plaintiff and the defendant desire to know which of them is successful (need for a specific closure), while the judge is only interested in making the final decision (need for nonspecific closure).

**Determinants of epistemic motivations.** Kruglanski (1990) proposed that all motivations are derived from “an individual’s cost-benefit analysis of the appropriate epistemic end states” (p. 182). In other words, people try to avoid closure if they perceive the costs of committing to a judgment error to be high. In contrast, people may desire closure if the benefits of acquiring a closure are great enough.

Individual differences can impact epistemic motivations. Ample research has focused on this aspect. Personality determinants can be classified into two categories: personal need for structure (PNS) and personal fear of invalidity (PFI). *PNS* reflects individual differences in needs for structure and clarity (Thompson et al., 2001). Individuals with high need for structure desire closure and tend to make definite judgments rather than leave a situation ambiguous. Also, high-PNS individuals perceive situations that are ambiguous and lack structure to be annoying. *PFI* reflects the fear of committing errors (Thompson et al., 2001). People high in fear of invalidity prefer ambiguous situations and consider the cost of committing an error to be high. Research has shown that high-PNS individuals have a tendency to reach conclusions quickly and base their judgments on existing knowledge, such as stereotypes or primed categories (Neuberg & Newsom, 1993). In contrast, high-PFI individuals are more sensitive to inconsistent evidence and more cautious about their judgments (Thompson et. al, 2001; & Thompson & Zanna, 1995).

Thompson et al. (2001) suggested that PFI and PNS were slightly and positively related to each other \( (r=.24) \). They proposed that the effects of PNS and PFI may be influenced by the situation. The two instruments may exert similar knowledge-acquisition influence in some situations while producing different influences in other situations. One explanation for a low degree correlation between the PFI and the PNS may be that while high levels of PNS always reflect a desire for closure, high PFI individuals may make either immediate decisions or prefer ambiguous situations. People high in PFI may be willing to see alternatives and delay decision making to avoid potential errors in general situation, but they tend to make a conclusion promptly to reduce ambiguity if they have confidence in this conclusion or they perceive the risk of generating more hypotheses to be high (Thompson et al., 2001). This hypothesis, however, still lacks of support from experimental research. Both the PFI and PNS scales will be included in this
study since they refer to “different routes toward the common end of attaining closure” (Thompson et al., 2001, p. 22) and the interaction between the PNS and PFI is worth investigating.

**Consequences of the need for closure.** Kruglanski & Webster (1996) propose that people under a high need for closure tend to engage in two sequential processes: “the urgency tendency” and “the permanence tendency.” The urgency tendency refers to “the inclination to ‘seize’ on closure quickly” (p. 265). People with a high need for closure desire to obtain any closure promptly, and consider any late closure as impertinence. As a result, they tend to make their decisions based on early information, to process less information and to generate fewer hypotheses before arriving at a conclusion. The permanence tendency is defined as the desire to protect or “freeze on” the previously formed conclusions. Specifically, during the permanence tendency process, people have the tendency to cease generating new hypotheses, avoid compelling evidence, and refuse to change.

According to Kruglanski (1990), the lay epistemic model is supported by ample social-psychological research. For instance, under high (versus low) need for closure, participants processed less information before reaching conclusions, were more theory driven than data driven, and based their judgments more on preexisting prejudices, stereotypes, and attitudes than according to the stimuli in the situation (Kruglanski & Freund, 1983, Kruglanski & Klar, 1987).

**Lay Epistemology Theory and Attitude Formation**

Attitudes are defined as “enduring systems of positive or negative evaluations, emotional feelings, and pro or con action tendencies with respect to social objects” (Krech, Crutchfield, & Ballachey, 1962, p.139). Attitudes comprise two elements: beliefs and evaluations (Ajzen & Fishbein, 1980). An attitude is a combination of beliefs about the attributes of an object and evaluations of these attributes.

Kruglanski (1990) suggested that attitude formation and modification is generally an epistemic process. Attitude formation includes a hypothesis-generation stage and a hypothesis-validation stage. Specifically, after being exposed to a stimulus, people tend to generate several alternative hypotheses (beliefs) about that object, and then to evaluate those hypotheses against available information. An attitude is evaluated in the same process as hypothesis validity (Kruglanski, 1990). In other words, the attitude is deduced from evidence (information). Kruglanski (1990) suggested
<table>
<thead>
<tr>
<th>PNS</th>
<th>PFI</th>
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| **High** | • Desire closure  
• Tend to reach conclusions quickly and base their judgments on existing knowledge, such as stereotypes or primed categories  
• Tend to engage in peripheral route processing  
• Tend to form their attitudes based on heuristics rather than on message arguments | • Prefer ambiguous situations  
• Consider the cost of committing an error to be high  
• Tend to be cautious about their judgments  
• Tend to engage in central route processing  
• Scrutinize all available information, including both heuristic cues and message arguments |
| **Low** | • Tend to engage in central route processing  
• Tend to examine as much information as possible before making decisions | • Tend to engage in peripheral route processing  
• Tend to form their attitudes based on heuristics rather than on message arguments |

Attitudes can be deduced either from heuristic cues such as perceived characteristics of the source (e.g., credibility or trustworthiness) or from message arguments.

Furthermore, both cognitive capability and epistemic motivations mentioned in lay epistemic theory affect attitude formation and change. One’s ability to process information available in the external environment, determined how much and which type of information will be used to form attitudes. Similarly, epistemic motivations (i.e., need for closure, need to avoid closure) determine whether the central or peripheral route processing will be taken to generate attitudes. As mentioned earlier, the central or peripheral routes are two underlying processes for persuasion. Kruglanski (1990) proposed that people with high need for closure personality might be motivated to engage in the peripheral route processing and base their attitudes on simplest cues, whereas people who are motivated to avoid closure might scrutinize all available information, including both heuristic cues and message arguments. Several previous studies
provide empirical support for this hypothesis. For example, Klein and Webster (2000) found that participants with a high need-for-closure personality processed a persuasive message according to simple cues rather than a systematic examination of the message content. In comparison, participants with relatively low need for closure carefully pondered message arguments. They also found that participants characterized as high in need-for-closure may process a message elaboratively if a heuristic cue was not available. Hamburger, Fine, and Goldstein (2004) discovered people in high need for closure desired a website with fewer hyperlinks, while people in low need for closure desired a website containing more hyperlinks. Clow and Esses (2005) indicated that participants higher in PFI sought more information before making judgments than did participants with lower PFI. Also, participants higher in PFI and lower in PNS generated the most accurate perceptions. In conclusion, under high need for structure, people tend to form their attitudes based on heuristics rather than on message arguments, while under high fear of invalidity, people tend to engage in central route processing and examine as much information as possible.

**Lay Epistemic Theory and DTCA**

The previous review suggests that side-effects information of drugs might be influential only for specific individuals. According to lay epistemic theory, side-effects information would be considered as inconsistent evidence with benefit information, and would be more salient for those trying to avoid closure. People high in personal fear of invalidity (PFI) have a tendency to generate more alternative hypotheses and postpone judgment. Therefore, when they are asked to form attitudes toward DTCA and the drug advertised, they may scrutinize every piece of information they can find. As a result, the information mentioned in the ads, especially the side-effects information, should greatly impact their judgment.

In comparison, individuals high in PNS would be more likely to base their judgments on heuristics and engage in simplistic forms of reasoning. As a result, there would be a less strong correlation between their attitudes toward specific ads and brands and side-effects information. In the DTCA context, it is predicted that high-PNS participants tend to base their judgments of the ad and brand on their global attitudes toward DTCA, while low-PNS participants tend to elaborately analyze stimulus information and will be affected by the statements of risk and benefit information.
HYPOTHESES

Based on the literature review, eight hypotheses were tested. Hypotheses 1a-d addressed the interaction effects between chronic information processing motives and the previously formed attitudes on individuals’ attitudes toward the ad and brand. As mentioned above, people high in PNS desire simple structures and tend to engage in heuristic processing when possible. As a result, their attitudes toward the DTCA and the drug advertised should be strongly affected by their global attitudes toward DTCA. Therefore:

H1a: Attitudes toward the brand will be more favorable among high-PNS participants with favorable global attitudes toward DTCA than it will among high-PNS participants with less favorable global attitudes.

H1b: Attitudes toward the ad will be more favorable among high-PNS participants with favorable global attitudes toward DTCA than it will among high-PNS participants with less favorable global attitudes.

Similarly, people low in PFI are not motivated to pursue the central route and may not attend systematically to the message content. As a result, it is predicted that they will base their attitudes toward the DTCA and the drug advertised on their global attitudes toward DTCA. Therefore:

H1c: Attitudes toward the brand will be more favorable among low-PFI participants with favorable global attitudes toward DTCA than it will among low-PFI participants with less favorable global attitudes.

H1d: Attitudes toward the ad will be more favorable among low-PFI participants with favorable global attitudes toward DTCA than it will among low-PFI participants with less favorable global attitudes.

Hypotheses 2a-d tested whether individual differences also interact with the type of risk information to influence individuals’ attitudes toward the ad and brand. Low-PNS individuals do not have the tendency to arrive at a conclusion promptly and may scrutinize the message arguments in order to make sound judgments. Given that risk information can serve as an argument in the DTCA context, low-PNS participants’ attitudes toward the ad and brand were predicted to be correlated with the type of risk information. Specifically, it was predicted that among participants who tend to pursue the central route, such as those with low levels of PNS, more favorable attitudes toward the ad and brand will occur for the DTC ad with mild (vs. severe)
side-effects information. Therefore:

H2a: Attitudes toward the *brand* will be more favorable among low-PNS participants presented with mild side-effects information than it will among low-PNS participants presented with severe side-effects information.

H2b: Attitudes toward the *ad* will be more favorable among low-PNS participants presented with mild side-effects information than it will among low-PNS participants presented with severe side-effects information.

People high in PFI are likely to search for as much information as possible and consider alternative options before obtaining a conclusion. According to the literature review, high-PFI individuals tend to engage in a central route processing and base their judgments of the ad and brand on the risk information. Therefore:

H2c: Attitudes toward the *brand* will be more favorable among high-PFI participants presented with mild side-effects information than it will among high-PFI participants presented with severe side-effects information.

H2d: Attitudes toward the *ad* will be more favorable among high-PFI participants presented with mild side-effects information than it will among high-PFI participants presented with severe side-effects information.
METHODOLOGY

Pretest of Fictitious DTCA

A pilot study was conducted two weeks prior to the main study to evaluate the quality of the fictitious print DTCA. Thirty-six Florida State University undergraduate students were recruited. Participants were presented with four advertisements, including a fictitious DTCA and three real ads (Geico Auto Insurance, Cingular, and Samsung) photocopied from current consumer magazines. Then they were asked to rate their general attitudes toward each ad using nine 7-point items (good/bad, like/dislike, interesting/boring, creative/uncreative, informative/uninformative, specific/general, convincing/unconvincing, believable/unbelievable, unbiased/biased). The scores for the nine items were then averaged to form an overall attitude toward the ad score. Higher scores reflect more favorable attitudes toward the ad.

T-tests indicated that there were no significant differences between participants’ evaluation of DTCA ($M_{DTCA}=4.18$) and their evaluation of Geico Auto Insurance, $t\ (35) = -.58, p>.10, (M_{Geico} = 4.07)$. Similarly, no significant differences were found between participants’ attitudes toward DTCA and their attitudes toward Cingular [$t\ (34) = 1.20, p>.10, M_{Cingular} = 4.38$) and Samsung [$t\ (33) = 1.08, p>.10, M_{Samsung} = 4.31$), respectively. Therefore, the fictitious DTCA was deemed suitable for the current study.

Sample

Participants were a convenience sample of 172 Florida State University undergraduate students. They were recruited through classes offered by the Department of Communication.

Most of the previous studies used older participants and argued that older consumers comprise a large and significant market segment for pharmaceutical advertisers. This segment is particularly susceptible and vulnerable to commercial persuasion. However, ignoring young adults is unwise since it is undeniable that they are also valuable consumers of the pharmaceutical industry. For example, according to the American Lung Association, the Centers for Disease Control and Prevention (CDC), and the National Institute of Allergy and Infectious Diseases (NIAID), asthma
affects approximately 24.7 million people in the US, with at least 7.7 million of them children under the age of 18. Additionally, according to the Johns Hopkins School of Public Health, over 18 million American women (ages 15 to 44) took birth control pills. The current study attempts to measure attitudes of college students toward DTCA.

**Variables**

The independent variables of this study were side effects information (mild vs. severe vs. no side effects information), global attitudes toward DTCA, personal need for structure, and personal fear of invalidity. The dependent variables of this study were participant attitudes toward the ads and brands and corporate credibility (discussed below).

**Stimuli**

The stimulus for this study was a fictitious print DTCA for prescription drugs. Usually DTCA has two pages: The first page provides a general introduction to the drug; the second page briefly summarizes such detailed technical information about the drug as usage directions, overdose information, and drug interaction information, in smaller font size and a lackluster format. Only the first page of a DTC ad was included in this experiment because previous findings showed that few people even bothered to read the second page of DTCA (Foley & Gross, 2000).

The drug advertised was an allergy medicine. According to the Third National Healthand Nutrition Examination Survey (Arbes, 2004), 54.3% of the population in the U.S. has positive test responses to one or more allergens. Therefore, using this type of drug can make sure that participants can understand what the advertising message. The ad was varied according to whether the risk information was severe or mild or not mentioned.

A fictitious allergy medicine named Vytelin and a fictitious manufacturer (Naomi) were created. The purpose of using fictitious DTCA was to make sure participants did not have preexisting attitudes toward the advertisement and the product. Further, it would be easy to make

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appropriate changes to the fictitious advertisement while making sure the other parts of the advertisement remain the same throughout all of the experimental conditions. The reason for creating a pharmaceutical company was to eliminate the influence of company credibility on participants’ attitudes toward ads and brands.

The type of side-effects information was operationalized by mentioning mild or severe side effects. The mild risk statements contained such side effects as drowsiness, mild fatigue, or mild headache; while the severe risk statements contained such side effects as chest pain, severe nausea and stomach pain, irregular heartbeat, yellowing of eyes or skin, and dark urine. Both mild and severe risk statements were excerpted from possible side effects of a real allergy medicine, CETIRIZINE (se-TI-ra-zeen). A control ad had no side-effects information.

Three other ads in the experiment served as distracters, thus masking the purpose the study. The products mentioned in those ads were Geico Auto Insurance, Cingular, and Samsung. These ads were photocopied from general consumer magazines.

**Measures**

**General attitude toward DTCA:** Participants’ global attitudes toward DTCA were assessed by asking them to rate, on a scale from 1 (strongly disagree) to 5 (strongly agree), their level of agreement with seven statements: “Advertisements for prescription drugs allow me to have better discussions with my doctor about my health,” “Advertisements for prescription drugs help me make better decisions about my health,” “Advertisements for prescription drugs help make me aware of new drugs,” “Advertisements for prescription drugs give enough information for me to decide whether I should discuss the drug with the doctor,” “Advertisements for prescription drugs do not give enough information about the possible risks and negative effects of using the drug,” “Advertisements for prescription drugs do not give enough information about the possible benefits and positive effects of using the drug,” and “Advertisements for prescription drugs make the drugs seem better than they really are.” The scales were adopted from a questionnaire developed by Schommer (1998). Higher scores indicate that participants held more favorable global attitudes toward DTCA.

**Attitude toward the brand:** Participants’ brand attitudes were evaluated from their ratings on four 7-point semantic differential items (bad/good, favorable/unfavorable, pleasant/unpleasant, good quality/poor quality). This scale was developed based on scales created by Biehal, Stephens and Curlo (1992), and by MacKenzie and Lutz (1990). The scores for the four items were averaged to form an overall attitude toward the brand score. Higher scores reflect more favorable attitudes toward the brand.

**Attitude toward the ad:** Participants’ attitudes toward ads were obtained by asking them to rate using nine 7-point items (good/bad, like/dislike, interesting/boring, creative/uncreative, informative/uninformative, specific/general, convincing/unconvincing, believable/unbelievable, unbiased/biased). The scores for the nine items were then averaged to form an overall attitude toward the ad score, with higher scores indicating more favorable attitudes. This scale was developed based on scales created by Biehal, Stephens, and Curlo (1992), and by MacKenzie and Lutz (1990). All mean ratings for attitudes toward the ad and brand were greater than the neutral midpoint (3.5) of the scale ($M = 3.98$, $M = 4.17$, respectively). In other words, all of the participants held fairly positive attitudes toward the ad and brand, which were consistent with previous research.

**Corporate credibility:** Previous research suggests that when people or institutions self disclose negative information, their credibility is enhanced (Williams, Bourgeois, & Croyle, 1993; Arpan & Roskos-Ewoldsen, 2005). This relationship was not hypothesized here, but was included to test the possibility for future research. Corporate credibility was assessed by a 7-point Likert scale that was developed by Newell (1993). Participants were asked to rate their level of agreement with eight items: “The Naomi Corporation has a great amount of experience,” “The Naomi Corporation is skilled in what they do,” “The Naomi Corporation has great expertise,” “The Naomi Corporation does not have much experience,” “I trust the Naomi Corporation,” “The Naomi Corporation makes truthful claims,” “The Naomi Corporation is honest,” and “I do not believe what the Naomi Corporation tells me.” The scores for eight items were then averaged to form an overall credibility score. The higher the score, the more credible participants considered the corporation to be.

**PFI:** The personal fear of invalidity scale is a 14-item scale, developed by Thompson et al. (2001). Participants were asked to rate their agreement with each statement (e.g. “I may struggle
with a few decisions but not very often,” “I never put off making important decisions,” “I tend to struggle with most decisions”) on a six-point Likert-type scale ranging from Strongly Disagree to Strongly Agree. Some items were appropriately reversed, and then scores from those 14 items were averaged to form a composite PFI score. Participants scoring above the 67th percentile (n = 52) were coded as high in PFI and those scoring below the 33rd percentile (n = 59) were coded as low in PFI.

**PNS:** The personal need for structure scale developed by Thompson et al. (2001) is a 12-item scale with 6-point Likert-type response categories, ranging from Strongly Disagree to Strongly Agree. Participants were asked to rate their level of agreements with such statements as “I like being spontaneous” and “I hate to change my plans at the last minute.” Some items were appropriately reversed, and then scores from the 12 items were averaged to form a composite PNS score. Participants scoring above the 67th percentile (n = 60) were coded as high in PNS and those scoring below the 33rd percentile (n = 51) were coded as low in PNS.

**Manipulation check of perceived risk:** Perceptions of risk information (mild vs. severe) were scales in 2001 (Neuberg & Thompson, 1997; Thompson, Naccarato, Parker, & Moskowitz, 2001). Webster and Kruglanski (1994) developed the need for closure scale (NFCS) in 1994. Both Neuberg (1993) and Thompson et al. (2001) demonstrated the internal consistency as well as convergent and discriminant validity of PNS and PFI scales. There were, however, debates on the discriminant validity of the NFC scale (i.e. whether the NFCS is redundant with the PNS and PFI scales) and whether the NFCS scale is a unidimensional or a multidimensional structure. (see Kruglanski, 1997; Neuberg, Judice & West, 1997; Neuberg & Thompson, 1997). First, both Neuberg, Judice, and West (1997) and Thompson et al. (2001) suggested high correlation between NFCS and PFI/PNS (an average correlation of .70). Specifically, when the NFCS was used as a unidimensional instrument, the median correlation between NFCS and PNS was .79. When the NFCS was used as a multidimensional instrument, the three major facets of the NFCS (i.e., preference for order, preference for predictability, decisiveness) still lack discriminant validity relative to the PNS and PFI scales (Neuberg, Judice, & West, 1997). The PNS and PFI scales are based on Kruglanski’s lay epistemic theory and are developed to measure very similar concepts. Additionally, Webster and Kruglanski (1994) acknowledged that eleven out of forty-two NFCS items were originally from the PNS (twelve items) and PFI scales (fourteen items) (Neuberg, Judice, & West, 1997). Therefore, as Kruglanski (1997) put it, “relations between the NFCS and preexisting instruments (such as PNS Scale) are to be expected” (p.1052). Second, Neuberg, Judice, and West (1997) suggested that the NFCS was a multidimensional scale and not suitable to be used unidimensionally. This proposal was supported by many other studies, including those examining the validity of the German and Chinese versions of the NFCS (Martin, 2002; Moneta & Yip, 2004; Thompson et al., 2001). Although the predictive validity of the NFCS was demonstrated by much experimental research (Kruglanski, 1997; Neuberg & Thompson, 1997), whether this scale can be used unidimensionally is still open to question. Therefore, the PNS and PFI scales rather than the NFCS will be included in this study.
measured by eight 7-point items, originally developed by Tyler and Cook (1984). Participants were asked to indicate their answers to eight questions: (1) How important is the side-effects information of the drug to you and (2) to other students (1= not at all important, 7= very important); (3) if you take the drug, how worried are you about being affected by side effects of the drug sometime in the future and (4) how worried do you believe that other students would be about being affected by the side effects of the drug sometime in the future (1=not at all worried, 7=very worried); (5) if you take the drug how likely it is that you personally and (6) other students will be affected by side effects information sometime in the future (1=very unlikely, 7=very likely); and (7) how much risk do you personally feel regarding the side-effects information of the drug and (8) how much risk do you believe that other students feel regarding the side-effects information of the drug (1=not at all, 7=a great deal). The scores for eight items were then averaged to form a composite manipulation check score, in which higher scores reflect higher perceived risk.

Demographics: Four demographic characteristics (age, major, sex and race) were measured at the end of questionnaire. Age and major were collected by asking participants to write in their age and major. Sex and race information were collect by asking participants to circle the attributes that applied to them.

Procedures

Pretest

A pretest was conducted to assess participants’ previous medicine knowledge and global attitudes toward DTCA, PNS, and PFI. The questionnaires were distributed in the classes and participants were informed that the purpose of the study was to measure personal differences in cognitive styles. They were able to take as much time as they wanted.

Posttest

A posttest was conducted two weeks later in order to prevent participants from guessing the purpose of the study and omit the potential influence of the pretest. The same group of participants were recruited and randomly assigned to one of three different experimental conditions (severe side-effects information versus mild-side effects information versus no-side effects information).
They were informed that the purpose of the study was to measure their attitudes toward various ads. Then, every participant received a package containing four ads and a set of questionnaires. Ads in different packets were arranged in random order, and those packages were randomly distributed to participants. The first section of the questionnaire measured participants’ attitudes toward ads, brands and corporate credibility; the second section of the questionnaire measured participants’ demographic information. Participants were instructed to read four ads first, and then fill out questionnaires. Participants had unlimited time to complete their task. Afterward, participants were thoroughly debriefed.

**Analysis**

Analysis of variance and t-tests were conducted in order to evaluate the potential interactions between independent variables and dependent variables. Also, tests of correlation were conducted to examine relationships between variables.
RESULTS

Demographic Characteristics

The sample for the current study consisted of 172 undergraduate students with various majors enrolled in at least one course within the Department of Communication. The age range for the participants was 18 to 26 ($M = 20$, $SD = 1.27$). Three-quarters of the participants were White. Sixty-five participants were presented with the ads containing severe risk information, sixty-four were presented with the ads that contained mild risk information, and forty-three were exposed to the ads without risk information. No significant differences in demographics were found across three groups (see Table 1). Chi-square tests showed that participants in three groups were not significantly different in gender or race ($p > .10$).

Table 2: Demographic characteristics of participants

<table>
<thead>
<tr>
<th></th>
<th>Severe risk information (n=65) (%)</th>
<th>Mild risk information (n=64) (%)</th>
<th>No risk Information (n=43) (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 to 20</td>
<td>61.5</td>
<td>57.8</td>
<td>69.8</td>
</tr>
<tr>
<td>21 to 22</td>
<td>35.4</td>
<td>34.4</td>
<td>27.9</td>
</tr>
<tr>
<td>23 to 26</td>
<td>3.1</td>
<td>7.8</td>
<td>2.3</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>20.3</td>
<td>27</td>
<td>30.2</td>
</tr>
<tr>
<td>Female</td>
<td>79.7</td>
<td>73</td>
<td>69.8</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>78.5</td>
<td>73</td>
<td>88.4</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>13.8</td>
<td>12.7</td>
<td>9.3</td>
</tr>
<tr>
<td>African American</td>
<td>7.7</td>
<td>11.1</td>
<td>2.3</td>
</tr>
<tr>
<td>Asian</td>
<td>0</td>
<td>3.2</td>
<td>0</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Internal Reliability

The internal reliability of the seven averaged variables (attitude toward the brand, attitude toward the ad, personal fear of invalidity, personal need for structure, corporate credibility, manipulation check of perceived risk and general attitude toward DTCA) were tested by using Cronbach’s alpha. The results of the six scales achieved the acceptable levels: .96 for attitude toward the ad; .87 for attitude toward the brand; .80 for personal fear of invalidity; .81 for personal need for structure; .91 for corporate credibility; .88 for manipulation check of perceived risk. Reliability among the whole set of global attitudes toward DTCA scales was low ([Alpha] = .57), so the last three items (“Advertisements for prescription drugs do not give enough information about the possible risks and negative effects of using the drug,” “Advertisements for prescription drugs do not give enough information about the possible benefits and positive effects of using the drug,” “Advertisements for prescription drugs make the drugs seem better than they really are”) were dropped from the scale, Alpha increased dramatically to .78. One explanation may be that since the first four statements were positively worded, many participants may not have noticed that the last three statements were negatively worded.

Manipulation Check

An analysis of variance performed on the manipulation check variable revealed that participants who received different types of risk information developed various levels of risk perception, $F(2, 168) = 6.97, p = .001$. A Tukey-B post-hoc analysis found risk perception generated by participants exposed to severe risk information differed from that developed by participants presented with no risk information ($M = 4.71$, $M = 3.92$, respectively), but no significant differences existed between groups receiving mild ($M = 4.48$) and severe risk information and between groups receiving mild and no risk information. T-tests (mild vs. severe) performed on each item in the manipulation check scale showed that there were significant differences for two items (“If you take the drug, how worried are you about being affected by side effects of the drug sometime in the future and,” and “if you take the drug how likely it is that you personally and will be affected by side effects information sometime in the future”). These two
items were then averaged to form a new manipulation check score. T-tests (mild vs. severe) performed on this new manipulation check variable showed significant differences, $t (127) = -1.89$, $p < .05$, ($M = 4.33$, $M = 4.78$, respectively).

T-tests also showed that participants presented with various types of risk information formed different attitudes toward the brand [$t (126) = 1.87$, $p < .05$] and the ad [$t (124) = 1.84$, $p < .05$]. Specifically, participants presented with severe risk information generated less favorable attitudes ($M = 3.80$, $SD = .95$) toward the brand than did those presented with mild risk information ($M = 4.11$, $SD = .93$). Similarly, participants exposed to severe risk information generated less favorable attitudes toward the ad ($M = 4.01$, $SD = .78$) than did those exposed to mild risk information ($M = 4.28$, $SD = .91$). Therefore, although manipulation check failed, manipulation of the type of risk information did have expected effects on participants’ attitudes toward the ad and brand. So, perhaps the problem was with the manipulation check itself.

**Hypothesis Testing**

**Hypothesis 1**

H1 predicated that high-PNS participants would pay special attention to heuristic cues and base their judgments about the DTCA primarily on their global attitudes toward DTCA. Similarly, low-PFI participants do not have the motivation to pursue the central route and systematically analyze message arguments, therefore, they may not attend to the risk information in the ad and ground their judgments on their previous attitudes toward DTCA. Pearson correlations and t-tests were performed to examine whether personal fear of invalidity and personal need for structure would interact with global attitudes to affect participants’ attitudes toward the ad and brand (see Table 3 to Table 8).

**Personal need for structure.** H1a predicted that attitudes toward the *brand* would be more favorable among high-PNS participants with favorable global attitudes toward DTCA than it would be among high-PNS participants with less favorable global attitudes. However, among high-PNS participants, no significant differences were found between those who had favorable (vs. less favorable) global attitudes ($p > .05$), although the means were in the expected direction (Table 3). However, when participants were divided into two groups according to their global attitudes
Table 3: Means and standard deviations of the attitudes toward the brand by the personal need for structure and global attitudes toward DTCA variables

<table>
<thead>
<tr>
<th>Personal need for structure</th>
<th>Global attitudes toward DTCA</th>
<th>$t$ Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Less favorable</td>
<td>More favorable</td>
</tr>
<tr>
<td>Low</td>
<td>M 3.86</td>
<td>SD .75</td>
</tr>
<tr>
<td></td>
<td>$t$ -2.01*</td>
<td></td>
</tr>
<tr>
<td>Medium</td>
<td>M 4.05</td>
<td>SD 1.05</td>
</tr>
<tr>
<td></td>
<td>- .91</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>M 3.63</td>
<td>SD .90</td>
</tr>
<tr>
<td></td>
<td>-1.21</td>
<td></td>
</tr>
</tbody>
</table>

*p<.05

Table 4: Means and standard deviations of the attitudes toward the ad by the personal need for structure and global attitudes toward DTCA variables

<table>
<thead>
<tr>
<th>Personal need for structure</th>
<th>Global attitudes toward DTCA</th>
<th>$t$ Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Less favorable</td>
<td>More favorable</td>
</tr>
<tr>
<td>Low</td>
<td>M 4.35</td>
<td>SD .87</td>
</tr>
<tr>
<td></td>
<td>.06</td>
<td></td>
</tr>
<tr>
<td>Medium</td>
<td>M 4.01</td>
<td>SD .86</td>
</tr>
<tr>
<td></td>
<td>-2.62*</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>M 3.95</td>
<td>SD .78</td>
</tr>
<tr>
<td></td>
<td>.01</td>
<td></td>
</tr>
</tbody>
</table>

*p<.05

toward DTCA, statistical power was reduced. Therefore, it is possible that the lack of significant results in t-tests could be attributed to recoding the global attitudes toward DTCA variable. A Pearson correlation analysis between global attitudes and attitudes toward the brand was conducted to examine this proposal (Table 5). As expected, the results indicated that among high-PNS participants, there was a significant, positive correlation between global attitudes and attitudes toward the brand ($r = .22, p < .05$).

Although it was expected that for low-PNS participants, no relationship would exist between global attitudes and attitudes toward the brand, low-PNS participants with more favorable global attitudes toward DTCA formed significantly more favorable attitudes toward the brand than did low-PNS participants with less favorable global attitudes, $t (49) = 2.01, p < .05$ ($M = 4.27, M = 3.86$, respectively). An examination of the Pearson correlations between global attitudes and attitudes toward the brand also revealed that among low-PNS participants, a significant positive correlation exists between global attitudes and attitudes toward the brand ($r = .23, p < .05$). In conclusion, the
results revealed that for both low-PNS and high-PNS participants, attitudes toward the brand were influenced by global attitudes toward DTCA. Therefore, H1a received limited support.

H1b predicted that attitudes toward the ad would be more favorable among high-PNS participants with favorable global attitudes toward DTCA than it would be among high-PNS participants with less favorable global attitudes. However, for both high-PNS and low-PNS participants, there were no significant differences between those who had favorable (vs. less favorable) global attitudes \((p>.05)\) (Table 4). Therefore, H1b was rejected. However, medium-PNS participants with more favorable global attitudes toward DTCA formed significant more favorable attitudes toward the ad than medium-PNS participants with less favorable attitudes toward DTCA, \(t (57) = -2.62, p<.01\) \((M = 4.59, M = 4.01,\text{ respectively})\). An examination of the Pearson correlations between global attitudes and attitudes toward the ad (Table 5) also found among medium-PNS participants a significant, positive correlation between global attitudes and attitudes...
Table 7: Means and standard deviations of the attitudes toward the ad by the personal fear of invalidity and global attitudes toward DTCA variables

<table>
<thead>
<tr>
<th>Personal fear of invalidity</th>
<th>Global attitudes toward DTCA</th>
<th>t Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Less favorable</td>
<td>More favorable</td>
</tr>
<tr>
<td>Low</td>
<td>4.14</td>
<td>4.46</td>
</tr>
<tr>
<td>Medium</td>
<td>4.18</td>
<td>4.33</td>
</tr>
<tr>
<td>High</td>
<td>3.88</td>
<td>3.99</td>
</tr>
</tbody>
</table>

*p<.05

Table 8: Correlations between global attitudes and the attitudes toward the brand and the ad under different personal fear of invalidity levels

<table>
<thead>
<tr>
<th>Personal fear of invalidity</th>
<th>Correlations between Global attitudes and the attitudes toward the brand</th>
<th>Correlations between global attitudes and the attitudes toward the ad</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>.15</td>
<td>.10</td>
</tr>
<tr>
<td>Medium</td>
<td>.14</td>
<td>.16</td>
</tr>
<tr>
<td>High</td>
<td>.23*</td>
<td>.00</td>
</tr>
</tbody>
</table>

*p<.05

toward the ad ($r = .27$, $p<.05$). No significant correlations were found between global attitudes and attitudes toward the ad among high or low PNS participants.

**Personal fear of invalidity.** H1c predicted that attitudes toward the brand would be more favorable among low-PFI participants with favorable global attitudes toward DTCA than it would be among low-PFI participants with less favorable global attitudes. However, $t$-tests indicated that low-PFI participants with more favorable global attitudes toward DTCA did not form more favorable attitudes toward the brand compared with low-PFI participants with less favorable global attitudes (Table 6). Among high-PFI participants, no significant differences were found among those who held more favorable attitudes (vs. less favorable attitudes) toward DTCA. As mentioned above, the power of $t$-tests was reduced due to recoding ratio data into nominal data. As a result, Pearson correlation tests were performed to further study the relationship between global attitudes toward DTCA and attitudes toward the brand under different levels of personal fear of invalidity (Table 8). Results revealed that a significant
correlation existed between global attitudes toward DTCA and attitudes toward the brand among participants with higher personal fear of invalidity, $r = .23, p<.05$. There were no significant correlations of two variables among low and medium PFI participants. Therefore, H1c was not supported.

H1d predicted that attitudes toward the ad would be more favorable among low-PFI participants with favorable global attitudes toward DTCA than it would be among low-PFI participants with less favorable global attitudes. However, no significant results were found through t-tests (Table 7) and or the tests of Pearson correlation (Table 8). That is to say, global attitudes toward DTCA did not influence participants’ attitudes toward the ad across different personal fear of invalidity levels. As a result, H1d was not supported.

Overall, although the analyses indicated that personal need for structure and personal fear of invalidity could affect information processing, the results were inconsistent with the predictions. For both high-PNS and low-PNS participants, attitudes toward the brand were influenced by global attitudes toward DTCA, while attitudes toward the ad were not affected by this variable. Only among medium-PNS participants were attitudes toward the ad affected by participants’ global attitudes toward DTCA. The analyses also indicated that for participants with higher personal fear of invalidity, attitudes toward the brand were influenced by their global attitudes toward DTCA.

**Hypothesis 2**

Low-PNS participants may attend not only to heuristic cues, but also to message arguments. Therefore, their attitudes should be influenced primarily by the statements of the benefit and risk information. Likewise, high-PFI individuals tend to obtain as much information as possible and scrutinize every piece of information before committing to any conclusion. Therefore, it is predicted that high PFI-participants will make their judgments about the ad and brand primarily on the statements of benefit and risk information. A one-way ANOVA was performed to examine the impacts of the type of risk information on participants’ attitudes toward the ad and brand under different levels of personal need for structure and personal fear of invalidity (see Table 8 to Table 11).
Table 9: Means and standard deviations of the attitudes toward the *brand* by the personal need for structure and the type of risk information variables

<table>
<thead>
<tr>
<th>Types of risk information</th>
<th>Personal need for structure</th>
<th>M</th>
<th>SD</th>
<th>M</th>
<th>SD</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>4.08a</td>
<td>.55</td>
<td>3.75a</td>
<td>.80</td>
<td>4.45bc</td>
<td>.74</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td>4.24a</td>
<td>.95</td>
<td>4.09a</td>
<td>1.04</td>
<td>3.95a</td>
<td>.77</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>4.02a</td>
<td>1.12</td>
<td>3.57a</td>
<td>.95</td>
<td>3.71a</td>
<td>.98</td>
</tr>
</tbody>
</table>

Note. Means within a row not containing a common subscript are significantly different from each other. *p* < .05

Table 10: Means and standard deviations of the attitudes toward the *ad* by the personal need for structure and the type of risk information variables

<table>
<thead>
<tr>
<th>Types of risk information</th>
<th>Personal need for structure</th>
<th>M</th>
<th>SD</th>
<th>M</th>
<th>SD</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>4.44a</td>
<td>.92</td>
<td>4.16a</td>
<td>.66</td>
<td>4.51a</td>
<td>.96</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td>4.26a</td>
<td>.89</td>
<td>4.24a</td>
<td>.88</td>
<td>4.34a</td>
<td>.84</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>4.19a</td>
<td>.96</td>
<td>3.62a</td>
<td>.64</td>
<td>4.07a</td>
<td>1.04</td>
</tr>
</tbody>
</table>

Note. Means within a row not containing a common subscript are significantly different from each other. *p* < .05

**Personal need for structure.** H2a predicted that attitudes toward the *brand* would be more favorable among low-PNS participants presented with mild side-effects information than among low-PNS participants presented with severe side-effects information. A significant difference was found among low-PNS participants presented with various types of risk information, $F(2, 48) = 4.02$, $p<.05$ (Table 9). Low-PNS participants presented with severe side-effects information developed most unfavorable attitudes toward the brand ($M = 3.75$), while low-PNS participants presented with no risk information developed most favorable attitudes toward the brand ($M = 4.45$). A Tukey-B post-hoc analysis showed that for low-PNS participants, significant differences existed between participants exposed to severe risk information and participants presented with no risk information, but no significant differences were found between groups receiving mild ($M = 4.08$) and severe risk information or between groups receiving mild and no risk information. For high-PNS participants, their attitudes toward the brand were not influenced by the type of risk information they were exposed to. Therefore, hypothesis 2a received limited support.
Table 11: Means and standard deviations of the attitudes toward the brand by the personal fear of invalidity and the type of risk information variables

<table>
<thead>
<tr>
<th>Personal fear of invalidity</th>
<th>Types of risk information</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>F Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mild</td>
<td>Severe</td>
<td>None</td>
<td>Mild</td>
<td>Severe</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M  SD</td>
<td>M  SD</td>
<td>M  SD</td>
<td>M  SD</td>
<td>M  SD</td>
<td>M  SD</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>4.21&lt;sub&gt;a&lt;/sub&gt; .93</td>
<td>3.70&lt;sub&gt;a&lt;/sub&gt; .72</td>
<td>4.21&lt;sub&gt;a&lt;/sub&gt; .96</td>
<td>2.57</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medium</td>
<td>4.13&lt;sub&gt;a&lt;/sub&gt; .79</td>
<td>3.95&lt;sub&gt;a&lt;/sub&gt; 1.21</td>
<td>4.20&lt;sub&gt;a&lt;/sub&gt; .43</td>
<td>.34</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>3.98&lt;sub&gt;a&lt;/sub&gt; 1.23</td>
<td>3.68&lt;sub&gt;a&lt;/sub&gt; .85</td>
<td>3.68&lt;sub&gt;a&lt;/sub&gt; .83</td>
<td>.53</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. Means within a row not containing a common subscript are significantly different from each other. *p< .05

Table 12: Means and standard deviations of the attitudes toward the ad by the personal fear of invalidity and the type of risk information variables

<table>
<thead>
<tr>
<th>Personal fear of invalidity</th>
<th>Types of risk information</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>F Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mild</td>
<td>Severe</td>
<td>None</td>
<td>Mild</td>
<td>Severe</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M  SD</td>
<td>M  SD</td>
<td>M  SD</td>
<td>M  SD</td>
<td>M  SD</td>
<td>M  SD</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>4.52&lt;sub&gt;a&lt;/sub&gt; 1.19</td>
<td>4.03&lt;sub&gt;a&lt;/sub&gt; .92</td>
<td>4.30&lt;sub&gt;a&lt;/sub&gt; 1.02</td>
<td>1.24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medium</td>
<td>4.27&lt;sub&gt;a&lt;/sub&gt; .62</td>
<td>4.12&lt;sub&gt;a&lt;/sub&gt; .71</td>
<td>4.41&lt;sub&gt;a&lt;/sub&gt; .94</td>
<td>.58</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>4.00&lt;sub&gt;a&lt;/sub&gt; .83</td>
<td>3.77&lt;sub&gt;a&lt;/sub&gt; .56</td>
<td>4.06&lt;sub&gt;a&lt;/sub&gt; .91</td>
<td>.70</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. Means within a row not containing a common subscript are significantly different from each other. *p< .05

H2b predicted that attitudes toward the ad would be more favorable among low-PNS participants presented with mild side-effects information than among low-PNS participants presented with severe side-effects information. However, there was no significant difference among low-PNS participants presented with different types of risk information (Table 10). Low-PNS participants presented with various types of risk information produced similar attitudes toward the ads. The same results were found among high-PNS participants. Therefore, hypothesis 2b was not supported.

Personal fear of invalidity. H2c predicted that attitudes toward the brand would be more favorable among high-PFI participants presented with mild side-effects information than among high-PFI participants presented with severe side-effects information. However, among high-PFI participants, no significant differences were found in term of attitudes toward the brand between those presented with severe risk information and those presented with mild risk information. H2c was not supported. The results of a one-way ANOVA indicated that there were not significant
differences among low-PFI participants' attitudes toward the brand when they received severe, mild and no risk information (Table 11).

H2d predicted that attitudes toward the ad would be more favorable among high-PFI participants presented with mild side-effects information than among high-PFI participants presented with severe side-effects information. However, no significant differences were found (Table 12). That is to say, participants’ attitudes toward the ad were not influenced by the type of risk information. Therefore, H2d was not supported.

In summary, for low-PNS, attitudes toward the brand were influenced by the type of risk information. For high-PNS and high-PFI participants, attitudes toward the brand remained the same across different types of risk information. Additionally, the type of risk information did not impact participants’ attitudes toward the ad under different levels of personal need for structure or personal fear of invalidity.
DISCUSSION

The current study examined the impact of individual differences in epistemic motivations (personal need for structure and personal fear of invalidity) on information processing in the context of DTCA. The results revealed that under different levels of personal need for structure and personal fear of invalidity, participants’ attitudes toward the ad and brand were influenced by various cues. However, hypotheses were only partially supported.

Findings related to participants’ attitudes toward the brand were somewhat consistent with the hypotheses when personal need for structure is taken into account. It was predicted that high-PNS participants tended to engage in peripheral route processing and based their judgments on heuristic cues, while low-PNS participants were motivated to analyze message arguments systematically and formed attitudes based on central cues. These hypotheses were supported by the results suggesting that high-PNS participants with more favorable global attitudes toward DTCA tended to generate more favorable attitudes toward the brand. Low-PNS participants developed more favorable brand attitudes when they received mild (vs. severe) risk information.

Interestingly, for low-PNS participants, there was also a positive correlation between their global attitudes toward DTCA and their attitudes toward the brand. This result may be attributed to the particular characteristics of DTCA. The short messages in the ad may have been insufficient for participants to make conclusions. Low-PNS participants often attend to both heuristic cues and arguments in the message and analyze as much information as possible before making decisions. Therefore, when arguments are not enough for them to arrive at their final decisions, they may base their judgments both on arguments and heuristic cues. In the current study, arguments were only the statements of benefit and risk information. If low-PNS participants realized that this information was inadequate, they may also have relied on some relevant information stored in their memory to make judgments. As a result, their final decisions might have been influenced by both their global attitudes and the drug information. Additionally, the fact that in this study, participants had unlimited reading time of short messages in a forced-exposure situation should have made it likely that participants would attend to both arguments and cues when processing the ads.

It is worth mentioning that the correlation between global attitudes and attitudes toward the
brand was stronger among low (vs. high) PNS participants, and this finding was unexpected. One explanation for this result is related to participants’ global attitudes toward DTCA. It is possible that some participants did not hold global attitudes toward DTCA but generated those attitudes when completing relevant questionnaire items. In this case, global attitudes would not be easy to retrieve from memory, and could not strongly predict attitudes toward the brand. Compared with low PNS participants, high PNS participants should not have been motivated to carefully scrutinize every piece of information before making judgments, therefore it might have been more difficult for them to relate their newly formed global attitudes toward DTCA with their attitudes toward the brand. This might explain the correlation between global attitudes and attitudes toward the brand being less strong among high (vs. low) PNS participants. Future study may further address this issue.

The current study expected that high-PFI participants would pursue the central route and form their attitudes toward the brand on the statements of drug information. However, opposite results were found. More specifically, the current study indicated that high-PFI participants with favorable (vs. less favorable) global attitudes toward DTCA developed more favorable attitudes toward the brand. On the other hand, the type of risk information did not influence their judgments on the brand. There are several reasons why high-PFI participants engage in the peripheral route. First, the factors that moderate the effects of personal need for structure can also be applied to these phenomena. Due to the short messages in the ad, high-PFI participants may not obtain adequate information from the ad to make decisions. Therefore, even if high-PFI participants were motivated to carefully analyze message arguments, the external environment limited their ability to do so.

Second, although high-PFI participants were expected to engage in central route processing, it is possible that in this study some of them were not motivated to carefully analyze the risk information. The Heuristic-Systematic Model (HSM) addresses this issue thoroughly. The HSM is an informational processing model similar to the ELM, but distinguishes itself by introducing sufficiency principle (Chaiken et al., 1989). The sufficiency principle suggests that epistemic motivations are determined by individual’s “actual” confidence and one’s “desired” confidence. Desired confidence works as a “sufficiency threshold” for stimulating individuals to engage in systematic processing. People tend to pursue systematic (central) processing when their desired confidence is higher than their actual confidence. The central processing can be induced by
increasing individual’s desired confidence or by reducing one’s actual confidence. Such variables as personally relevant messages and task importance can increase desired confidence. In this experiment, the stimulus (the ad of an allergy drug) was not necessarily highly relevant to participants’ daily lives; each question did not have right or wrong answer; and except for the DTCA, three other ads were used as distracters. Therefore, participants’ desired confidence was not enhanced by external variables; the effect of personal fear of invalidity to increase participants’ desired confidence might have also been attenuated. As a result, high-PFI participants might have failed to pay close attention to risk information.

The third explanation lies in the limitation of PFI. As mentioned in the literature review section, if individuals under high fear of invalidity condition have great confidence on a certain conclusion, they may commit to this conclusion immediately (Kruglanski, 1996). In the current study, it is quite possible that high-PFI participants trusted their global attitudes toward DTCA and drew the conclusions promptly before scrutinizing the side-effects information.

To summarize, the current study suggested that PNS and PFI did influence which information processing routes people may pursue to make their judgments. However, mixed findings revealed that the effects of PNS and PFI might be diluted by many external factors, and future research is needed to clarify the effects of PNS and PFI on information processing routes.

The current study also revealed some interesting results about the effects of risk information in DTCA. First, this study revealed that all mean ratings for attitudes toward the ad and brand were greater than the neutral midpoint of the scale. In other words, consistent with previous research, participants held fairly positive attitudes toward the ad and brand no matter which type of risk information was presented.

Second, for participants that pursued the central route (i.e., low PNS), attitudes toward the drug were more favorable among participants presented with no (vs. severe) risk information. In other words, risk information negatively affected participants’ attitudes toward the brand. This result suggests that for pharmaceutical manufacturers that only focus on increasing drug sales, it is quite helpful to reveal as little side-effects information as possible.

Third, some participants did not seem to respond to the risk and benefit information even though they were forced to read the DTCA. The results indicated that low PNS participants did not differentiate the ad with mild side-effects information from the ad with severe side-effect information. It appears, therefore, there is no need for advertisers to hide severe side-effects
information from consumers.

The current study also provided support for FDA’s regulations on DTCA. This study suggested that side-effects information in general can influence consumers’ evaluation of the advertised drug. DTCA should provide accurate and complete information to help consumers make the right medication decisions. Therefore, strict guidelines on DTCA seem necessary.

**Limitations and Suggestions for Future Research**

First, this study is limited to print DTCA. Although research in print DTCA may help us understand the ads in other media, previous studies showed that the type of channel could mediate the effects of the advertisement. For example, some research indicated that television DTCA promoted drug information-seeking, while magazine DTC advertising produced stronger views of patient authority in health care decision making (Morris, 1986). Future research may examine Internet DTCA and television DTCA respectively, especially taking into account interactive features of Internet ads and the visual features of television ads.

Second, the present study only focuses on textual presentation of risk information in print ads. Future research is needed to investigate the variations in benefit information, visual background and brief summary of print DTCA on consumers’ attitudes change. Additionally, some DTCA offers sources of additional information (e.g., toll-free number, websites, or physicians). Future research may investigate the effects of referring consumers to other sources for more complete information.

Third, this study employed a convenience sample, therefore the findings cannot be generalized to the population. Future studies may consider drawing simple random samples from a population. In addition, previous research suggested that older consumers are a valuable market segment for pharmaceutical industry (Huh, DeLorme, & Reid, 2004). Future studies may also benefit from recruiting older people as subjects. Furthermore, undergraduate students instead of patients were recruited in this study. It is quite possible that healthy students consider DTCA as irrelevant to their lives and did not pay attention to the ad. As a result, PNS and PFI may not be strong enough to motivate those students to engage in central route processing. In contrast, patients may be highly involved in DTCA and might have read the ad carefully, regardless of their personality differences. Therefore, it may be helpful for future study to distinguish patients
Fourth, epistemic motivation can be determined by individual differences and situational stimuli, while this current study only took personality into account. Previous research indicated that situational stimuli can exert effects similar to those exerted by personality in information processing. Also, situational stimuli may interact with individual differences and enhance the effects of each other (Hamburger, Fine & Goldstein, 2004). Future studies may benefit from manipulating the epistemic motivation factors and investigating their impact on information processing.

Fifth, due to the extent and focus of the current study, the cognitive capability variable was not investigated. However, epistemic ability is also an important concept in lay epistemic theory, and limited research has been conducted in this area. It is predicted that previous knowledge structures determined people’s respective abilities to analyze an issue (Kruglanski & Freund, 1983). For example, people with great knowledge have the ability to ponder message arguments and delay closure while people with little knowledge have no choice but to arrive at a conclusion quickly. Future research is needed thoroughly to examine this concept.
APPENDIX A

INFORMED CONSENT FORM FOR PRETEST
INFORMED CONSENT STATEMENT

I have been informed that Jia Lu, a master student in the department of Communication, has requested my participation in the research project.

I understand that this study will take around 15 minutes. My participation will involve answering paper and pencil questionnaires about myself and my opinions.

I understand that there are no foreseeable risks or discomforts if I agree to participate in this study.

I understand that the result of this research study may be published but my name or identity will not be revealed. Only group findings will be reported. The information in the study records will be kept confidential to the degree allowed by law. Data will be stored in a locked closet near the office suite of Communication Department in UCC, 3rd floor, and will be made available only to persons conducting the study. Data will be destroyed within five years of publication in a research journal.

I understand there are benefits for participating in this research project. For participating I will receive either (a) credit toward a class requirement or (b) extra credit for my class, the amount of which is determined by the instructor of the course from which I was recruited. It may also be useful to see how research in communication is conducted.

Any questions I have concerning the research or my participation in it, before or after my consent, will be answered by Dr. Laura Arpan at 645-4693 or Jia Lu at 339-4344. Also, if I have any questions about my rights as a subject/participant in this research, or if I feel I have been placed at risk, I can contact the Chair of the Human Subjects Committee, Institutional Review Board, through the Vice President for the Office of Research at (850) 644-8633.

I have read and understand this consent form. I understand that I may withdraw my consent and discontinue participation at any time without penalty or loss of benefits to which I may otherwise be entitled. In signing this consent form, I am not waiving any legal claims, rights or remedies. A copy of this consent form will be given (offered) to me.

___________________  ____________________
(Participant name)   (Date)
APPENDIX B
INFORMED CONSENT FORM FOR POSTTEST
INFORMED CONSENT STATEMENT

I have been informed that Jia Lu, a master student in the department of Communication, has requested my participation in the research project entitled *Effects of Advertising on Consumers’ Product Attitudes*.

I understand the purpose of the research is to better understand judgments about different kinds of advertisements.

I understand that this study will take around 15 minutes. My participation will involve reading advertisements and answering paper and pencil questionnaires. I also understand I will be asked for demographic information. This will be used for classification purpose only.

I understand that there are no foreseeable risks or discomforts if I agree to participate in this study.

I understand that the result of this research study may be published but my name or identity will not be revealed. Only group findings will be reported. The information in the study records will be kept confidential to the degree allowed by law. The information in the study records will be kept confidential to the extent allowed by law. Data will be stored in a locked closet near the office suite of Communication Department in UCC, 3rd floor, and will be made available only to persons conducting the study. Data will be destroyed within five years of publication in a research journal.

I understand there are benefits for participating in this research project. For participating I will receive either (a) credit toward a class requirement or (b) extra credit for my class, the amount of which is determined by the instructor of the course from which I was recruited. It may also be useful to see how research in communication is conducted.

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I have read and understand this consent form. I understand that I may withdraw my consent and discontinue participation at any time without penalty or loss of benefits to which I may otherwise be entitled. In signing this consent form, I am not waiving any legal claims, rights or remedies. A copy of this consent form will be given (offered) to me.

___________________

(Participant name)   (Date)
APPENDIX C

ADVERTISEMENTS
DO YOU SUFFER FROM ALLERGIES?
DON'T FORGET TO ASK YOUR DOCTOR ABOUT

VYTELIN
100 mg
200 mg

While many allergy medicines block histamines, VYTELIN blocks leukotrienes, an underlying cause of allergy symptoms. If you have indoor or outdoor allergies, treat your allergy symptoms differently with VYTELIN. VYTELIN is approved to help relieve both indoor and outdoor allergy symptoms for a full 24 hours. Ask your doctor about VYTELIN today.

Important information.
Side effects that may occur while taking this medicine include severe chest pain, severe nausea and stomach pain, irregular heartbeat, yellowing of eyes or skin, or dark urine. Contact your doctor immediately if you experience any of those symptoms.

For more information about VYTELIN, please visit www.VYTELIN.com or call 1-800-376-6587.

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DO YOU SUFFER FROM ALLERGIES? 
DON'T FORGET TO ASK YOUR DOCTOR ABOUT 

VYTELIN 

100 mg 
200 mg 

While many allergy medicines block histamines, VYTELIN blocks leukotrienes, an underlying cause of allergy symptoms. If you have indoor or outdoor allergies, treat your allergy symptoms differently with VYTELIN. VYTELIN is approved to help relieve both indoor and outdoor allergy symptoms for a full 24 hours. Ask your doctor about VYTELIN today.

Important information.

Side effects that may occur while taking this medicine include drowsiness, mild fatigue, or mild headache. If they continue or are bothersome, check with your doctor.

For more information about VYTELIN, please visit www.VYTELIN.com or call 1-800-376-6587.

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DO YOU SUFFER FROM ALLERGIES?
DON’T FORGET TO ASK YOUR DOCTOR ABOUT

VYTELIN
100 mg
200 mg

while many allergy medicines block histamines, VYTELIN blocks leukotrienes, an underlying cause of allergy symptoms. If you have indoor or outdoor allergies, treat your allergy symptoms differently with VYTELIN. VYTELIN is approved to help relieve both indoor and outdoor allergy symptoms for a full 24 hours. Ask your doctor about VYTELIN today.

For more information about VYTELIN, please visit www.VYTELIN.com or call 1-800-376-6587.

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DTCA without side-effects information
APPENDIX D
PRETEST QUESTIONNAIRE
Indicate your agreement with each of the following. Please circle.
(SD=Strongly Disagree; D=Disagree; N=Neutral; A=Agree; SA=Strongly Agree)

I may struggle with a few decisions but not very often.  
SD  D  N  A  SA

I never put off making important decisions.  
SD  D  N  A  SA

Sometimes I become impatient over my indecisiveness.  
SD  D  N  A  SA

Sometimes I see so many options to a situation that it is really confusing.  
SD  D  N  A  SA

I can be reluctant to commit myself to something because of the possibility that I might be wrong.  
SD  D  N  A  SA

I tend to struggle with most decisions.  
SD  D  N  A  SA

Even after making an important decision I continue to think about the pros and cons to make sure that I am not wrong.  
SD  D  N  A  SA

Regardless of whether others see an event as positive or negative I don’t mind committing myself to it.  
SD  D  N  A  SA

I prefer situations where I do not have to decide immediately.  
SD  D  N  A  SA

I rarely doubt that the courses of action I have selected will be correct.  
SD  D  N  A  SA

I tend to continue to evaluate recently made decisions.  
SD  D  N  A  SA

I wish I did not worry so much about making errors.  
SD  D  N  A  SA

Decisions rarely weigh heavily on my shoulders.  
SD  D  N  A  SA

I find myself reluctant to commit to new ideas but find little comfort in remaining with the tried and true.  
SD  D  N  A  SA

It upsets me to go into a situation without knowing what I can expect from it.  
SD  D  N  A  SA

I’m not bothered by things that upset my daily routine.  
SD  D  N  A  SA

I enjoy having a clearly structured mode of life.  
SD  D  N  A  SA

I like a place for everything and everything in its place.  
SD  D  N  A  SA

I like being spontaneous.  
SD  D  N  A  SA

I find that a well ordered life with regular hours makes my life tedious  
SD  D  N  A  SA

I don’t like situations that are uncertain.  
SD  D  N  A  SA

I hate to change my plans at the last minute.  
SD  D  N  A  SA
I hate to be with people that are unpredictable.  
SD  D  N  A  SA

I find that a consistent routine enables me to enjoy life more.  
SD  D  N  A  SA

I enjoy the exhilaration of being put in unpredictable situations.  
SD  D  N  A  SA

I become uncomfortable when the rules in a situation are not clear.  
SD  D  N  A  SA

I am knowledgeable about medication  
SD  D  N  A  SA

When it comes to medications, I understand all I need to know.  
SD  D  N  A  SA

I am well informed about medications.  
SD  D  N  A  SA

I pay much attention to advertisements for medications.  
SD  D  N  A  SA

I am excited when other people talk to me about what medications they take.  
SD  D  N  A  SA

I have much interest in getting the latest information about medications.  
SD  D  N  A  SA

Advertisements for prescription drugs help me have better discussions with my doctor about my health.  
SD  D  N  A  SA

Advertisements for prescription drugs help me make better decisions about my health.  
SD  D  N  A  SA

Advertisements for prescription drugs help make me aware of new drugs.  
SD  D  N  A  SA

Advertisements for prescription drugs give enough information for me to decide whether I should discuss the drug with my doctor.  
SD  D  N  A  SA

Advertisements for prescription drugs do NOT give enough information about the possible risks and negative effects of using the drug.  
SD  D  N  A  SA

Advertisements for prescription drugs do NOT give enough information about the possible benefits and positive effects of using the drug.  
SD  D  N  A  SA

Advertisements for prescription drugs make the drugs seem better than they really are.  
SD  D  N  A  SA
APPENDIX E
POSTTEST QUESTIONNAIRE
1. Please indicate your feelings about the prescription drug *VYTELIN*:

<table>
<thead>
<tr>
<th>Feelings</th>
<th>7</th>
<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>2</strong></td>
</tr>
<tr>
<td>Favorable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>1</strong></td>
</tr>
<tr>
<td>Pleasant</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Good quality</td>
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</table>

2. Please indicate your feelings about the *advertisement* for *VYTELIN*:

<table>
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<tr>
<th>Feelings</th>
<th>7</th>
<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
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<td>Good</td>
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<tr>
<td>Like</td>
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<td>Interesting</td>
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<td>Creative</td>
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<td>Informative</td>
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<tr>
<td>Specific</td>
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<td>Convincing</td>
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<td>Believable</td>
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<td>Unbiased</td>
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3. Indicate your agreement of each of the following. Please circle.

**(SD=Strongly Disagree; D=Disagree; N=Neutral; A=Agree; SA=Strongly Agree)**

<table>
<thead>
<tr>
<th>Statement</th>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Naomi Corporation has a great amount of experience.</td>
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<tr>
<td>The Naomi Corporation is skilled in what they do.</td>
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<tr>
<td>The Naomi Corporation has great expertise.</td>
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<tr>
<td>The Naomi Corporation does <em>not</em> have much experience.</td>
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<tr>
<td>I trust the Naomi Corporation.</td>
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<td>The Naomi Corporation makes truthful claims.</td>
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<td>The Naomi Corporation is honest.</td>
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<tr>
<td>I do <em>not</em> believe what the Naomi Corporation tells me.</td>
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</tbody>
</table>
1. Please recall as much information mentioned in the advertisements for the prescription drug VYTELIN and Samsung Mobile as possible.

2. Please answer the following questions.

   1. How important is the side effects information of the Vytelin drug to you?
      Not at all important          Very Important
      1  2  3  4  5  6  7

   2. If you take the Vytelin drug, how worried would you be about being affected by the side effects of the Vytelin drug sometime in the future?
      Not at all worried          Very worried
      1  2  3  4  5  6  7

   3. How likely is it that if you take the Vytelin drug you personally would be affected by its side effects sometimes in the future?
      Very unlikely          Very likely
      1  2  3  4  5  6  7

   4. How much risk do you personally feel from the side effects information of the Vytelin drug?
      None at all          A great deal
      1  2  3  4  5  6  7

   5. How important is the side effects information of the Vytelin drug to other students?
      Not at all important          Very Important
      1  2  3  4  5  6  7

   6. If other students take the Vytelin drug, how worried do you believe that they would be about being affected by the side effects of the drug sometime in the future?
      Not at all worried          Very worried
      1  2  3  4  5  6  7

   7. How likely is it that if other students take the Vytelin drug they would be affected by its side effects sometime in the future?
      Very unlikely          Very likely
      1  2  3  4  5  6  7

   8. How much risk do you believe other students feel from the side effects information of the Vytelin drug?
      None at all          A great deal
      1  2  3  4  5  6  7
6. How old are you? ____

7. What’s your major? __________________

8. Sex (Please circle one)  Male      Female

9. Which of the following best describes your race?
   ____ White  ____ Hispanic/Latino  ____ African American  ____ Asian  ____ other: ________
APPENDIX F
HUMAN SUBJECTS APPROVAL LETTERS
APPROVAL MEMORANDUM

Date: 9/14/2006

To: Jia Lu
328 Pennell Cir. Apt. 5
Tallahassee, FL 32310

Dept.: COMMUNICATION

From: Thomas L. Jacobson, Chair

Re: Use of Human Subjects in Research
Effects of Direct to Consumer Advertising of Prescription Drugs

The forms that you submitted to this office in regard to the use of human subjects in the proposal referenced above have been reviewed by the Human Subjects Committee at its meeting on 7/12/2006. Your project was approved by the Committee.

The Human Subjects Committee has not evaluated your proposal for scientific merit, except to weigh the risk to the human participants and the aspects of the proposal related to potential risk and benefit. This approval does not replace any departmental or other approvals which may be required.

If the project has not been completed by 7/11/2007 you must request renewed approval for continuation of the project.

You are advised that any change in protocol in this project must be approved by resubmission of the project to the Committee for approval. The principal investigator must promptly report, in writing, any unexpected problems causing risks to research subjects or others.

By copy of this memorandum, the chairman of your department and/or your major professor is reminded that he/she is responsible for being informed concerning research projects involving human subjects in the department, and should review protocols of such investigations as often as needed to insure that the project is being conducted in compliance with our institution and with DHHS regulations.

This institution has an Assurance on file with the Office for Protection from Research Risks. The Assurance Number is IRB00000440.

cc: Dr. Laura Arpan
HSC No. 2006.0570
Office of the Vice President For Research
Human Subjects Committee
Tallahassee, Florida 32306-2742
(850) 644-8673  -  FAX (850) 644-4392

APPROVAL MEMORANDUM (for change in research protocol)

Date: 3/29/2007

To:
Jia Lu
325 Pennell Cir. Apt. 5
Tallahassee, FL 32310

Dept: COMMUNICATION

From: Thomas L. Jacobson, Chair

Re: Use of Human subjects in Research
Project entitled: The Impact of Side Effects Information in Direct-to-Consumer Prescription Drug Advertising on Consumers' Product Attitudes

The memorandum that you submitted to this office in regard to the requested change in your research protocol for the above-referenced project have been reviewed and approved. Thank you for informing the Committee of this change.

A reminder that if the project has not been completed by 7/11/2007, you must request renewed approval for continuation of the project.

By copy of this memorandum, the chairman of your department and/or your major professor is reminded that he/she is responsible for being informed concerning research projects involving human subjects in the department, and should review protocols of such investigations as often as needed to insure that the project is being conducted in compliance with our institution and with DHHS regulations.

This institution has an Assurance on file with the Office for Protection from Research Risks. The Assurance Number is IRB00000448.

cc: Dr. Laura Arpan
APPLICATION NO. 2006.0570
REFERENCES


Jia Lu was born on February 13, 1983 in Fujian, P. R. China. She received her bachelor’s degree in Journalism and Communication from Xiamen University in 2005; her master’s degree in Media and Communication Studies from Florida State University in 2007. Jia will pursue her Ph.D. and has been accepted to the doctoral program of Mass Communication at Florida State University. Her research interests include media effects and social marketing.