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The Effects of Risk Disclosure in Direct-to-Consumer Prescription Drug Advertising (DTCA): Prominence, DTCA Regulatory Knowledge, and Perceived Attention

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I am submitting herewith a dissertation written by Ilwoo Ju entitled "The Effects of Risk Disclosure in Direct-to-Consumer Prescription Drug Advertising (DTCA): Prominence, DTCA Regulatory Knowledge, and Perceived Attention." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Communication and Information.

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The Effects of Risk Disclosure in Direct-to-Consumer Prescription Drug Advertising (DTCA): Prominence, DTCA Regulatory Knowledge, and Perceived Attention

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Dedication

I dedicate this dissertation to my family who has shared every moment and given me worthy opportunities for growth. This work could not have been completed without their love and prayer.

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Abstract

Fair balance of benefit and risk information in consumer prescription drug advertising (DTCA) has received much research attention. In this regard, it has been well-documented that varying levels of risk disclosure prominence have disproportional effects on consumer response to the DTC ad. However, little research has examined how the prominence effects can be maximized or minimized depending on consumers' varying levels of knowledge of the FDA's regulatory role for DTCA. In a similar vein, rare research has been conducted to investigate how such regulatory knowledge directly affects consumers' risk disclosure coping strategies.

Drawing on consumer information processing perspectives, this research employs an experimental approach to examine one manipulated categorical variable, one measured continuous variable, and their interactive effects on consumer response to the ad, while controlling for potential covariates. Specifically, two levels of risk disclosure prominence are manipulated (high vs. low) and coded as a dummy variable, and DTCA regulatory knowledge is measured as a continuous variable. Further, based on the persuasion knowledge model (PKM) framework, DTCA regulatory knowledge is tested as a moderator of the prominence effects. Consumer memory such as unaided-recall and aided-recognition of the health risks of the medicine presented in the ad as well as self-reported perceived attention to risk disclosure are addressed as criterion variables.

The major findings are summarized as follows: (1) both higher DTCA regulatory knowledge and higher prominence enhanced perceived attention to risk disclosure; (2) both higher DTCA regulatory knowledge and higher prominence enhanced consumer recognition of risk information; (3) DTCA regulatory knowledge moderated the prominence effects on

perceived attention to risk disclosure; (4) the main DTCA regulatory knowledge effects and the main prominence effects on consumer recall and recognition were mediated through perceived attention to risk disclosure; (5) However, the moderated mediation effect analyses revealed that the effects of prominence on recall and recognition were mediated through perceived attention among low DTCA regulatory knowledge consumers, whereas the mediating effects were minimal among high DTCA regulatory knowledge consumers.

The overall findings support the current study's conceptual framework. The theoretical, managerial, and consumer education/public health implications of this research are discussed.

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CHAPTER 1: INTRODUCTION

Research Problem

Given that today's health care patients are increasingly referred to as *consumers* (Hibbard & Weeks, 1987; Tomes, 2006), *health care consumerism* is defined as consumers' *autonomy* in their health care management (Hibbard & Weeks, 1987). In this regard, Almond (2001) suggests that the terms *partnership* and *participation* are regarded as appropriate labels for the consumer-oriented contemporary health care context. In order to achieve sound healthcare partnership participation, consumers must be provided with accurate and comprehensive health information to make informed health choices, including information about available medical remedies and their potential health risks. Direct-to-consumer prescription drug advertising (DTCA) represents one important health information source (Royne & Myers, 2008; Macias, Pashupati, & Lewis, 2007; Macias, Lewis, & Baek, 2010), and therefore it is critical to consider how consumers' perception regarding health issues are influenced by DTCA health information (Park, Ju, & Kim, 2013; Ju & Park, 2013).

However, despite the presumed importance of DTCA, the literature has found that most DTC ads tend to present information about the uses and efficacy of the medicine more prominently than its possible health risks (e.g., Avery, Eisenberg, & Simon, 2012; Davis, Cross, & Crowley, 2007; Davis & Meader, 2009; Huh & Cude, 2004; Kaphingst, Dejong, Rudd, & Daltroy, 2004; Macias et al., 2007; Macias et al., 2010; Sheehan, 2007). In line with this finding, the Federal Food, Drug, and Cosmetic Act (*hereinafter*, FFD&C Act; 21 U.S.C. 352) requires pharmaceutical advertisers to present any word, statement, or other information *prominently* to be noticed, attended and processed by the ordinary individual under customary conditions of

purchase and use. Especially, regarding important health risk information in DTC ads, pharmaceutical advertisers are obligated to prominently provide risk disclosure to be comparable with benefit and use information in their promotional materials, a policy commonly referred to as the *fair balance* requirement (21 Code of Federal Regulation 202.1; *hereinafter*, 21 CFR 202.1).

The FDA (2009) provides specific guidance to pharmaceutical advertisers regarding how they must present important health risks of the medicine in DTCA. For instance, risk information *prominence* is considered an important aspect, and it could consist of various message execution factors such as typography, layout, contrast, headlines, paragraphing, white space, and other techniques used to achieve emphasis (US Department of Health and Human Services [DHHS], 2010). However, little research has empirically examined how the effects of such message execution factors can be influenced by consumer characteristics (Davis, 2010; Macias et al., 2007; Sheehan, 2007). This limitation in the literature poses a necessity to investigate how the risk disclosure prominence effects on consumer response to the DTC ad can be affected by individual differences in consumer characteristics. That is, understanding in which situations the effects could be enhanced or diluted, and in what mechanisms the effects operate remain as understudied areas.

Furthermore, the direct effects of consumer characteristics on consumer response to the DTC ad have also been rarely examined. To address this void in the DTCA literature, the current research addresses the direct effects of DTCA regulatory knowledge, its moderating role of the risk disclosure prominence effects, along with the direct effects of risk disclosure prominence on consumer response to the DTC ad. To do so, the current research borrows from the persuasion knowledge model (PKM) to conceptualize the direct and moderating influences of DTCA

regulatory knowledge, and draws on the FDA's (2009) conceptualization of risk disclosure prominence to test the effects of varying levels of risk disclosure prominence.

Although a body of DTCA research has examined the content of DTC ads in terms of *fair balance* between benefit and risk information, most of the studies have exclusively relied on descriptive content analysis to determine the relative quantity of risk information compared to benefit information (Davis, 2010; Davis & Meader, 2009; Huh & Cude, 2004; Macias et al., 2007, 2010). However, to better understand the dynamic consumer information processing of DTCA risk disclosure, one needs to examine under which conditions consumers could benefit from risk disclosure provision more or less (Harker & Harker, 2007).

Research has rarely examined how consumer's cognitive factors affect their information processing of risk disclosure. Consumers' knowledge of the FDA's regulatory role for DTCA may be one critical variable that has not been explored in terms of consumers' DTCA risk disclosure coping strategies. Given that it has been well-documented that consumers' cognitive structure such as marketplace knowledge or beliefs may exert considerable influence on consumers' persuasive message coping strategies (Boush, Friestad, & Wright, 2009; Friestad & Wright, 1994; Obermiller & Spangenberg, 1998; Obermiller, Spangenberg, & MacLachlan, 2005), the lack of research addressing this perspective in the DTCA literature is undesirable.

Additionally, little research has explored a psychological mechanism whereby DTCA regulatory knowledge, DTCA risk disclosure prominence, and their interplay may influence recall and recognition of risk information. Although we know that in general enhanced cognitive fluency may improve information processing outcomes (e.g., Alba & Hutchinson, 1987; Kardes, Posavac, & Cronley, 2004; Lynch & Srull, 1982), a theory-driven research should provide

convincing evidence regarding the process in the DTCA context. By revealing the black box in consumers' risk disclosure processing mechanism, those involved in DTCA will benefit from the current study's findings.

Purpose of the Study

The prescription drug industry is considered a high consequence area that affects public health considerably. A number of consumer researchers have voiced that the examination of DTCA impact on consumers should be based on observation of consumers' actual response to DTCA (e.g., Beltramini, 2010; Hoek, Gendall, Rapson, & Louviere, 2011; Kavadas, Katsanis, & LeBel, 2007; Myers, Royne, & Deitz, 2011). Such consumer-oriented approach will provide insight into how to better encourage consumers to process information about the benefits and risks of the drug in a balanced manner. Further, the approach will offer useful guidance for the development of effective risk disclosure communication and consumer education program by the FDA and pharmaceutical marketers, which have been underexplored in the literature.

From consumer education and public health perspectives, effective health risk information provision through DTCA has an important implication. Considering that consumers' sound health decisions hinge largely upon their appropriate use of health information, the current research will elucidate how risk disclosure in DTCA can be more effectively presented in order to enhance consumers' cognitive memory performance regarding risk information in the ad.

It is worth noting that, during the last decades, the FDA's DTCA public policy has shifted its focus from DTCA content per se to consumers' actual perception about the promoted medicine (Davis & Meader, 2009; FDA, 2009). Despite a line of research on DTCA that has

examined consumer perception such as general attitudes toward DTCA (e.g., Sumpradit, Ascione, & Bagozzi, 2004) and preferences for communicating risk information (Davis, 2007), how consumers' cognitive knowledge structure can affect the dynamic mechanism of risk disclosure coping strategies has received little research attention to date. By addressing this gap in the literature, consumer educators, pharmaceutical marketers, and health communication researchers will benefit from the current research's findings.

Specifically, the current research attempts to examine the effects of consumer knowledge of the FDA's regulatory role for DTCA (hereinafter, DTCA regulatory knowledge), risk disclosure prominence, and their interplay on consumer response to the DTC ad, including perceived attention to, recall, and recognition of risk information in the DTC ad. Based on the PKM perspective, DTCA regulatory knowledge is viewed as one type of crucial pharmaceutical marketplace belief. Depending on varying levels of DTCA regulatory knowledge, consumers' risk information processing outcomes using DTCA may largely vary.

The additional purpose of the present study is to investigate how the effects of DTCA regulatory knowledge, risk disclosure prominence, and their interaction on consumers' memory of the drug's potential health risks presented in the ad are mediated by perceived attention to risk information in the ad. Considering that perceived attention represents one type of proxy measure for consumer attention, perceived ease with locating disclosure in DTCA is expected to mediate the effects of DTCA regulatory knowledge, disclosure prominence, and their interaction on consumers' cognitive memory performance, including the extent of recall and recognition of health risk information (Bettman, Payne, & Staelin, 1986). Illuminating this under-examined area will inform how risk disclosure in DTCA should be presented to enhance consumer benefit,

and how consumers' marketplace persuasion knowledge can contribute to public health.

The Organization of Dissertation

This dissertation is organized as follows. The next chapter presents a brief introduction to the DTCA context. The chapter introduces the controversy over DTCA and the DTCA market in the US context. Then, previous research on DTCA and the fair balance requirement with a focus on risk disclosure are reviewed in order to provide a foundation for the research phenomenon of this dissertation.

The next section addresses the importance of examining consumer information processing in regard to DTCA risk disclosure. In the same chapter, based on the review of literature, the research framework of this dissertation is introduced for examining DTCA regulatory knowledge as a consumer factor and DTCA risk disclosure prominence as a message-side factor. In addition, the interactive relationship between DTCA regulatory knowledge and risk disclosure prominence is addressed, along with the mediating role of perceived attention. By doing so, this chapter extends prior research on DTCA risk disclosure and the PKM perspective. Then, this chapter elaborates more on the FDA's conceptualization of risk disclosure prominence in DTCA to operationalize prominence in the experiment of current research. Based on the review of literature, this chapter develops the research hypotheses.

The third chapter addresses the method of this research with justification. Using an experimental approach, risk disclosure prominence is manipulated and tested as an independent variable, and DTCA regulatory knowledge is measured and tested as not only an independent variable but also a moderator of the prominence effects on consumer response to the ad.

Criterion variables' measures of this research include consumers' perceived attention to, recall of, and recognition of risk information. Perceived attention is conceptualized and measured as a self-reported indicator to represent a proxy measure of consumers' subjective attention. Recall and recognition are measured to assess objective cognitive task performance to complement the subjective self-report measure. Finally, potential covariates of the criterion variables are identified from the health communication literature and controlled to exclude potential confounding influences on the outcome variables.

The fourth chapter provides information about the analytical approach with justification and the findings of this research. In this chapter, a set of multiple hierarchical regressions are employed to test the main effects of DTCA regulatory knowledge and risk disclosure prominence along with their interactive effects, as developed in the literature review chapter. In addition, adopting a widely utilized approach to pinpoint the interaction pattern for regression equations, the slopes and intercepts of the regression equations (for each subgroup: high and low prominence) of this research are interpreted to see if the interactive patterns between DTCA regulatory knowledge and risk disclosure prominence are consistent with the hypothesized ones. Finally, a *bootstrap* approach, a contemporary method for mediation analysis, is employed to examine the hypothesized mediating role of perceived attention.

The fifth chapter draws upon the results and discusses meaningful findings regarding the effects of DTCA regulatory knowledge, risk disclosure prominence, their interaction, and the mediating effects of perceived attention. The theoretical, managerial, and consumer education/public health implications of the research are addressed. The final chapter addresses the limitations of the study and suggests avenues for future research.

CHAPTER 2: LITERATURE REVIEW

The DTCA Market

DTCA refers to the prescription drug ads that are published in magazines and newspapers distributed to general consumers, and electronic media such as TV, radio, and the Internet are also considered important platforms for DTCA (FDA, 2014a). Since the early 1990s when some drug manufacturers began targeting consumers, DTCA has been one of the most widely utilized health information sources (FDA, 2014a). In particular, after the restrictions on the DTCA regulations were relaxed in 1997, its marketing expenditure has rapidly increased to be the second largest consumer advertising category during the period of 2007-2008 (Nielsen, 2009).

More specifically, the DTCA spending of TV, radio, magazines, newspapers, and outdoor, reached $4.9 billion in 2007 (Hilsenrath, 2011). Although it decreased to $4.3 billion in 2009 (Kaiser Family Foundation, 2010), to $4.0 billion in 2010, and to $3.9 billion in 2011 (IMS Health, 2011), after the severe US economic recession of 2007-2008, the recent DTCA expenditure reportedly turned to increase again. Further, when considering the growth potential of Internet and mobile media DTCA, this advertising category will continue to grow for the meantime. As a matter of fact, pharmaceutical marketers are increasingly embracing the Internet as a promotional medium (Dutta-Bergman, 2004; Wymer, 2010). Online DTCA expenditure alone is estimated to reach $1.3 billion by 2008 (Oser, 2006).

Today, the average American TV viewer watches as many as nine drug ads a day and approximately 91% of Americans report that they are aware of the DTCA category (Myers, Royne, & Deitz, 2011; Ventola, 2011). In the same token, those who watch average amounts of TV are estimated to view approximately 30 hours of DTCA annually (An, 2007; Avery,

Eisenberg, & Simon, 2012). Overall, given its amount of advertising spending and consumer exposure to it, DTCA is considered a major consumer advertising category in the US consumer media market (An & Muturi, 2011; Matear & Dacin, 2010; Royne & Myers, 2008; Tsai & Lancaster, 2012; van de Pol & de Bakker, 2010).

The Context of DTCA

The early DTCA appeared in the US mass media in the 1980s though it has become a popular promotional tool since the early 1990s (FDA, 2014a). At first, it was almost impossible for pharmaceutical advertisers to meet the FDA's strict requirements for information provision due to the limitations of time in broadcast media, and therefore DTCA has been rarely implemented in electronic media until the FDA's relaxation of its regulations over DTCA in television in 1997 (An & Kang, 2011).

Only two countries in the world allow DTCA due to its potential harmful consequences on public health (Royne & Meyer, 2008): the US and New Zealand. In the US, prescription drug advertising was allowed only to health care professionals in the past, based on the belief that the general public would be less capable of understanding information about the uses and risks of medical remedies (Macias & Lewis, 2004). However, the contemporary healthcare system and communities have shifted to encourage the *partnership* between patients and health professionals (Almond, 2001; Tomes, 2006). One of the drivers of this change may include consumers' increased motivation for seeking health information and well-being. In addition, due to the advance of media technologies including the Internet and portable communication devices, consumers now have more access to various health information sources than ever before. In this

context, DTCA is considered one of such important health information sources.

Over the past few decades, however, DTCA has raised a severe controversy among its stakeholders. The proponents and opponents of DTCA have insisted on their own point of views, and research findings regarding the influence of DTCA on consumers remain mixed (Royne & Myers, 2008). DTCA proponents maintain that DTCA appears to drive conversation about possible medical treatment options between the patient and their physician (Auton, 2007) as well as remind the patient who already has been prescribed medicines to take them. From the proponents' perspective, DTCA is expected to provide current and potential patients with useful health information that help them make informed health decisions (Royne & Myers, 2008).

Another alleged contribution of DTCA to public health is its capability to help people recognize whether they may contract a certain disease that would otherwise remain unidentified and untreated (Donohue & Berndt, 2004; Peyrot, Alperstein, Van Doren, & Poli, 1998; Roth, 1996). Advocates also argue that DTCA empowers patients to take a more active role in their health care management (Holmer, 1999) and reduces the stigma associated with treatment of certain health conditions such as clinical depression (An & Kang, 2011). Overall, proponents' contention can be summarized as DTCA's educational contribution to informed health decisions and public health promotion in the long run (An & Muturi, 2011; Royne & Myers, 2008). Advocates also point out that excessive regulations on DTCA may violate the freedom of speech clause in *the First Amendment* (Grenard, Uy, Pagan, & Frosch, 2011).

In contrast, opponents maintain that DTCA tends to drive consumers' unnecessary use of medicines and urge them to spend on expensive branded drugs while steering them away from generics that are equally or less-expensive (An & Muturi, 2011). Opponents also criticize that the

relationship between the patient and their physician may deteriorates due to DTCA's prompting of patients' disobedience and inappropriate prescription request (Rosenthal & Donohue, 2005). In this regard, physicians have expressed a concern that patients' inappropriate prescription request often disturbs physician-patient conversation because they need to spend much time correcting consumers' misunderstanding obtained from DTCA (Harker & Harker, 2007; Royne & Myers, 2008). Moreover, dissenters assert that information conveyed in DTC ads may confuse vulnerable people and seek drug promotion rather than educating consumers about important health issues (Royne & Myers, 2008; Tsai & Lancaster, 2012; Wolfe, 2002). Given these concerns about the advertising category, critics have voiced that DTCA possibly leads to an over-medicalized society that relates to an increase in the overall health care cost in society as a whole (Beltramini, 2010; Parker & Pettijohn, 2003).

However, DTCA has already been allowed in the US. Despite the heated debate over the advertising category, considering both positive and negative aspects of DTCA, researchers need to examine how this advertising category may contribute to public health better. An alternative discourse of the debate would be on seeking knowledge on how to promote the public's informed health decision through providing accurate and balanced health information and encouraging consumers to process them adequately. If essential health information can be effectively conveyed to and attended by consumers, this advertising category may successfully serve public health education goals. In this regard, research on how consumer characteristics can affect DTCA message coping strategies is a critical initiative.

Previous Research on DTCA

A line of research has examined the content of DTCA. For instance, Sheehan (2007) found that in a majority of branded prescription drug websites, the presentation of risk information was significantly subordinate to that of promotional information. Hoek, Gendall, and Freetham (2012) found that medical information overload may result in reduced consumer comprehension. In this regard, Kaphingst et al., (2005) note that if consumers have a low level of health literacy, misunderstanding of the drug's uses and risks could occur. These studies imply that the way of presenting health information in DTCA may affect consumers' perception and decision making.

In terms of message appeals employed in DTCA, Macias, Pashupati and Lewis (2007) and Tsai and Lancaster (2012) found that most DTC ads employed both informational and emotional appeals to a similar degree. However, they note that if advertisers use emotional appeals more than informational appeals, it could make consumers' attention stay away from detailed drug attribute information (Tsai & Lancaster, 2012).

Another body of studies addressed consumer attitudes toward DTCA. Vatjanapukka and Waryzak (2004) found that those who have been frequently exposed to DTC ads showed more favorable attitudes toward the DTCA category. Women reported more favorable attitudes toward DTCA (Robinson et al., 2004). In addition, senior Americans showed more favorable attitudes toward DTCA than younger Americans (Williams & Hensel, 1995).

Recently, in response to the FDA's interest in consumer perception (FDA, 2009), research has examined various DTCA message strategies in terms of their effects on consumer response to the ad. Bhutada, Cook, and Perri (2009) found that using reference to coupons in ads

affect consumers' evaluations of the ads. Shim, Cappella, and Leman (2010) also found that presenting familiar health risks may improve consumer involvement with the ad. Ju and Park (2013) examined the effects of numerical information in DTCA on consumers' evaluations of the ad and found that numerical drug information could enhance consumers' perceived effectiveness and attitudes toward the ad.

In sum, prior research could be categorized into four broad groups. First, one program of research has examined the content of DTCA in terms of the relative proportion of benefit and risk information. Second, message appeals have been a popular topic in the DTCA literature. Third, general consumer attitudes toward DTCA have been examined. Finally and more recently, research began to examine the effects of message strategies on consumers' perception and behavior regarding health issues.

However, despite this abundance of DTCA research, little research has explored how risk disclosure presentation formats have consequences for consumer response to the ad, and how individual differences in consumer characteristics influence such processes. Risk disclosure in DTCA is required by the *fair balance* requirement (21 CFR 202.1) and examining the impact of risk disclosure format represents an important research initiative. Nevertheless, since 2009 when the FDA issued draft guidance of risk communication in DTCA, rare research has provided empirical findings regarding various message execution factors outlined in the draft guidance, while considering various consumer-side factors. To better understand the impact of DTCA on consumers, more consumer-driven research is warranted.

The Fair Balance Requirement of DTCA

The FFD&C Act (21 U.S.C. 352) requires pharmaceutical marketers to present any word, statement, or other information in advertising *prominently* to render them to be read and understood by the ordinary individual under customary conditions of purchase and use. In particular, pharmaceutical manufacturers are obligated to provide important health risk information conspicuously in their promotional materials (21 CFR 202.1). The provision of important risk information in advertising is referred to as *risk disclosure* (or *disclaimer*) and its major purpose is to offer consumers an opportunity to consider potential risks of the product before purchase and use, and thereby help them make sound purchase decisions (Andrews, Netmeyer, & Burton, 2009; Stewart & Martin, 2004).

In this regard, the *fair balance* requirement of benefit and risk information in DTCA has received considerable research attention. A number of studies have examined whether pharmaceutical advertisers comply with the requirement through examining the content of DTCA (e.g., Huh & Cude, 2004; Kaphingst et al., 2004; Macias & Lewis, 2003; Macias et al., 2007, 2010; Sheehan, 2007; Sumpradit et al., 2004). The FFD&C Act (21 U.S.C. 352) and FDA's regulations (21 CFR 202.1) clearly state that DTCA must present information about the drug's effectiveness and risk in a fairly balanced manner in terms of content and format. In particular, in its 2009 draft guidance for industry on the risk information presentation in prescription drug promotion, the FDA provides specific guidelines for pharmaceutical advertisers regarding how they can develop the content and format of DTCA to comply with the FD&C Act. It is worth noting that the guidance provides a list of message execution factors that the FDA considers when it reviews risk communication in DTCA.

Importantly, the FDA (2009) points out that it views consumers' *net impression* about the drug as an important consideration when reviewing DTCA. This agency clearly indicates that its concern about consumer impression draws on well-developed social science theories (FDA, 2009) and the concern is in alignment with the approach of other agencies such as the Federal Trade Commission's (FTC, 1984) policy statement on *deception* (103 F.T.C. 110, 174). For instance, according to the FTC statement, advertising deception can be determined by examining the *overall consumer impression* created by a certain advertising practice, claim, or representation (103 F.T.C. 110, 174). In a similar vein, pharmaceutical industry members have also conducted research and pointed out that the *net impression* shaped by the ad as a whole is an important aspect to consider, independent of specific claims within the ad (PhRMA, 2009).

However, the majority of DTC ads tend to emphasize the benefits of the drug more prominently than risks (Lexchin & Mintzes, 2002; Macias et al., 2007; Sheehan, 2007; Roth, 1996). A concern is whether the risk disclosure secures sufficient consumer attention to risk information (Kopp & Bang, 2000). If an ad fails to present the disclosure with sufficient prominence, the provision itself will not be effective for encouraging consumers to consider the potential health risks of the drug use (Davis, 2010; Davis & Meader, 2009; Hoek et al., 2011).

In this regard, the FDA issues administrative letters (i.e., warning letters and untitled letters) directly to the advertiser and publicize on the FDA's website when an advertiser violates the *fair balance* requirement. Among others, *risk minimizing* practices have been frequently cited as one type of violation in the letters (Huh & Becker, 2005; Sheehan, 2003, 2007). Minimizing drug risk is likely to result in consumers' inappropriate prescription drug requests and uses. Therefore, examining the effects of risk disclosure prominence on consumers' perception may

offer invaluable insight.

Risk Disclosure in DTCA

Advertisers exert efforts to present their products and services in a favorable light in ads, and thereby make them stand out among their competitors in a positive way (Eisend, 2006; Kamins, Brand, Hoeke, & Moe, 1989). From the advertiser's perspective, disclosing negative aspects of brands may be less welcome (Franke, Huhmann, & Mothersbaugh, 2004; Hoek et al., 2011; Kavadas et al., 2007). In line with this, researchers have noted that pharmaceutical advertisers may be motivated to present serious health risks of the medicine inconspicuously, while seeking to emphasize the benefits of it (e.g., Kavadas et al., 2007; Roth, 1996; Royne & Myers, 2008; Morris & Millstein, 1984). As a matter of fact, research found that disclosing health risks of drugs in DTC ads may result in unfavorable consumer response to the drug. For instance, a higher ratio of risk information compared to the ratio of benefit information was more likely to decrease consumers' behavioral intentions to use the promoted drug (Kavadas et al., 2007; Royne & Myers, 2008).

With regard to this, some consumer advertising categories have been required to present important risk information associated with the use of products and services in their promotional materials, a practice commonly named *disclosures* (or *disclaimers*) (Andrew et al., 2009). The purpose of advertising disclosure is to clarify or qualify potentially misleading or deceptive statements made within an ad (Hoy & Andrews, 2004).

Disclosures are a regulatory action to promote consumers' complete understanding about product attributes that may be integral to their decision making (Andrew et al., 2009; Stewart &

Martin, 2004). Advertising disclosure can take on various forms including product claims, risks of product usage, and information about reducing or avoiding risks (Stewart & Martin, 2004). In light of this, DTCA risk disclosure typically provides information about important health risks, side effects, and contraindications, associated with the use of prescription medicine.

Today, advertising disclosure became prevalent in the consumer information environment (Andrews et al., 2009). The majority of consumers are aware of that disclosures are required by law in certain product categories such health warnings in cigarette advertising (Eisend, 2006). In this context, consumers should be able to utilize such disclaimers to make informed purchase decisions (Foxman, Muehling, & Moore, 1988). Disclosures that are clearly and prominently displayed can be effective for reducing misbeliefs and shaping attitudes and intentions (Hoy & Stankey, 1993; Andrews et al., 2000; Wilkie, 1985). Furthermore, pharmaceutical advertisers can be also protected from potential undue accusations of misleading or deceptive advertising, assuming that the advertisers meet the risk disclosure requirements appropriately (Andrews et al., 2000).

In the DTCA context, pharmaceutical advertisers are obligated to provide important health risk information in DTC ads (21 CFR 202.1). However, to help prescription drug consumers make sound prescription decisions, researchers need to understand how information about health risks of the drug can be displayed more effectively. To do so, a consumer-oriented research approach will provide insight into the development of more effective DTCA risk communication. In addition, this approach also allows researchers to better understand the risk disclosure processing mechanism from the consumer perspective. In the following section, the literature on consumer information processing is reviewed with a focus on how DTCA risk

disclosure prominence may help information processing.

Consumer Information Processing and DTCA Disclosure Prominence

Various advertising message strategies have been reported to result in varying consumer responses to the ad (e.g., Lee et al., 2011a, 2011b; Liebermann & Flint-Goor, 1996). Extending this view to DTCA risk disclosure processing, risk disclosure presentation strategies are likely to affect consumers' responses to the disclosure (Davis, 2010; Davis & Meader, 2009; Hoek et al., 2011; Kavadas et al., 2007; Ju & Park, 2013). For instance, various message factors such as the amount, emphasis, and specificity of messages will influence how risk disclosure is processed by consumers (Kavadas et al., 2007; Morris, Ruffner, & Klimberg, 1985).

From a consumer information processing perspective, the success of risk disclosure provision accrues to the extent that consumers *notice, process,* and *comprehend* such information properly (Bettman & Kakkar, 1997; Bettmam, Payne, & Staelin, 1986; MacCarthy & Mothersbaugh, 2002; MacInnis & Jaworskin, 1989; MacInnis, Moorman, & Jaworski, 1991). In particular, to encourage consumers to pay sufficient attention to risk disclosure in advertising, disclosures need to be displayed clearly and conspicuously (Hoy & Andrew, 2004).

This thought is reflected in the *clear, conspicuous, and neutral* (CCN) requirement added to the amended FFD&C Act by the Food and Drug Administration Amendments Act of 2007 (DHHS, 2010). Although the amendment was targeted at DTC television or radio ads, the principle is applicable across different DTCA practices in that it aims to improve risk communication in DTCA in general. According to the CCN requirement, the major statement relating to the side effects and contraindications of an advertised prescription drug must be

presented in a clear, conspicuous, and neutral manner (DHHS, 2010).

The main purpose of the CCN requirement is to encourage DTC advertisers to present potential health risk information in a more prominent manner to be easily attended and processed by the consumer. In light of this, message strategies that promote consumers to easily pick out and make use of such information are an important prerequisite for proper processing of DTCA disclosures (Hoek et al., 2011).

In the same token, the FDA's (2009) draft guidance of risk communication provides a useful list of message execution factors that are expected to affect consumer processing of risk disclosure, including overall location of risk disclosure, its font size, contrast, white space, etc. No matter what execution devices are employed, if an ad fails to provide sufficient emphasis on risk disclosure comparable with benefit information, it is considered a lack of *fair balance* (21 CFR 202.1(e)(7)(viii)).

Why does the prominence of DTCA risk disclosure matter? From an information processing perspective, disclosures are critical communication tools and remedies when consumers use potentially risky products or services (Andrews, 1998). Well-executed risk disclosure provision can reduce inappropriate *impression* about promoted drug brands (Sheehan, 2007). Furthermore, disclosures can broaden consumers' *cognitive reference* and thereby help them avoid unrealistic generalization of the product's efficacy (Andrews et al., 2000; Andrews et al., 2009).

Andrews et al. (2009) summarize main cognitive functions of disclosures. Disclosures allow consumers to access important risk information that is central to their decision making, and therefore facilitate consumers' retrieval of such information available in memory. In addition,

disclosure can serve as a diagnostic reference point used for evaluating the ad claims. In the same vein, disclosures can broaden the cognitive frame, and as a result reduce inappropriate generalizations of the product' efficacy. Based on this, disclosures may contribute to enhanced accessibility, diagnosticity, and comprehension of advertising information (Andrews et al., 2000).

Based on the literature, if disclosures are presented prominently in DTCA, consumer processing performance will increase for information on the potential health risks of the drug. Assuming that a major goal of DTCA disclosure is to educate consumers about important health risks of the drug, risk disclosure prominence should be a critical research agenda to promote consumers' sound health decisions.

Cognitive Fluency and Risk Disclosure Processing

With regard to risk disclosure processing, consumers' cognitive fluency represents an important consideration. Consumer information processing is affected by a wide range of factors and *cognitive fluency* has been known to play an important role (Bettman & Kakkar, 1977; Bettman et al., 1986; Moorman, Diehl, Brinberg, & Kidwell, 2004). During the 1970s and 1980s, a body of research attempted to examine the utility of information processing principles in examining risk disclosure effects (e.g., Dyer & Shimp, 1977; Jacoby & Small, 1975; Wilkie & Gardner, 1974). The studies suggested in common that effective disclosure programs need an understanding of consumer information processing mechanisms (Mazis & Staelin, 1982). In this regard, borrowing from information processing research will shed much light on understanding the dynamic mechanism of DTCA disclosure processing.

Hierarchy-of-effects communication models provide a theoretical foundation of the current research. McGuire (1976) was one of frontiers who laid out the theoretical framework to understand consumer information processing sequences. According to his framework, consumers typically goes through a serious of sequences in acquiring, processing, and using information. More specifically, the sequences have at least five folds: *exposure*, *attention*, *comprehension*, *retention*/*retrieval*, and *decision making* (McGuire, 1976). Although these phases are not always clearly distinct from each other or do not always go through this order, the framework serves as a useful foundation for examining how consumer information processing operates and which cognitive factors should be examined (Mazis & Staelin, 1982).

More importantly, the model suggests that there could be factors that enhance or impede communication effectiveness. In light of the current research, an important information processing phase may be *attention.* Attention measures serve as an important variable for the early stages of information processing (Krugman, Fox, Fletcher, Fischer, & Rojas, 1994). It has been well-documented that despite their limited cognitive capacity (Lynch & Srull, 1982; Mazis & Staelin, 1982), today's consumers are exposed to a vast amount of marketplace information (Boush et al., 2009; Knowles & Linn, 2003). If advertisers fail to attract consumer attention to important product attribute information, communication effectiveness will be significantly decreased (Krugman et al., 1994).

Once consumers paid sufficient attention to information, consumers should be able to retrieve the stored information, and more prominent information is more likely to be retrieved in a decision making situation (Alba & Hutchinson, 1987; Lynch & Srull, 1982). When consumers are exposed to information, it is transformed into consumers' cognitive storage (i.e., memory), a

process referred to as *encoding*. Prominence of information has been regarded as a factor that enhances *ease of encoding* (Alba & Hutchinson, 1987; Lynch & Srull, 1982). That is, more prominent events in the information environment are more likely to enhance consumer encoding of information (Bettman et al, 1986). In this regard, Mazis and Staelin (1982) note that information presented in a confusing manner is more difficult to encode and retrieve (i.e., decode). This line of studies suggests to examine the effects of prominence on consumers' attention and memory.

The Influence of Cognitive Structure

To better understand the risk disclosure processing phenomenon, one needs to look to consumer-side aspects as well as message-side factors. Mazis and Staelin (1982) note that *attention* and information *retention/retrieval* are affected by both internal and external factors. As noted, external factors may involve the characteristics of the message itself such as risk disclosure prominence. On the other hand, internal factors may include consumer capacity and motivation to process the information (Mazis & Staelin, 1982). In particular, cognitive structure such as persuasion knowledge has been suggested as an important consideration in information processing (Alba & Hutchinson, 1987; Friestad & Wright, 1994; Goodstein, 1993; Kardes et al., 2004). In light of this, examining the interplay between internal and external factors may provide invaluable insight into our understanding of consumers' risk disclosure coping strategies.

Among others, the current research addresses *DTCA regulatory knowledge* to examine how consumers' category-based processing (Goodstein, 1993) affects their response to the DTC ad. Consumer psychology indicates that preexisting category knowledge links consumers'

expectations to their motivation to process and evaluate information stimuli (Sujan, 1985). This category knowledge structure is referred to as *schemata* (Goodstein, 1993). Advertising schemas are developed through repeated learning regarding a particular advertising category, and this can involve semantic and structural features (Friestad & Wright, 1994). Based on the literature, therefore, it is expected that consumers' cognitive schemas regarding a particular regulatory context for ad design (i.e., DTCA regulatory knowledge) can be organized around product categories (Goodstein, 1993). In addition, individuals may have different levels of DTCA regulatory knowledge because they may have varying levels of experience with DTCA. Addressing the role of DTCA regulatory knowledge may shed light on how consumers cope with DTCA information using their regulatory schema regarding the DTCA category, which is an underexplored area.

DTCA Regulatory Knowledge and Risk Disclosure Prominence

The notion of information *encoding* (i.e., storing) and *decoding* (i.e., retrieving) proficiency is often associated with preexisting memory structure (Bettman et al., 1986; Mazis & Staelin, 1982). As noted, cognitive schemata involve how information is organized in a long-term memory regarding a particular category. DTCA regulatory knowledge may represent one type of cognitive schemata regarding the DTCA category. This knowledge can include overall understanding of FDA's overall control over DTCA, particularly its content and design, and developmental and approval process. In addition, *textual schemata* relate the extent to which consumers are familiar with a particular way of information presentation in a particular information category (Bettman et al., 1986; Sheehan, 2007). Given that consumers are socialized

to learn about how DTCA tends to present information about the medicine (i.e., headline, uses and efficacy information, and risk disclosure) and how such information is regulated by law, the overall heuristic based on type regulatory and textual schemata regarding DTCA serves as cognitive processing facilitators. That is, information organization that is compatible with consuimers' pre-existing schemata would be more easily recognized and therefore effective (Sheehan, 2007). Although Sheehan (2007) notes that textual schemata would facilitate consumer information processing from DTCA, given the unique regulatory context of DTCA for ad design, examining the interactive influence of textual and regulatory schemata could provide richer insight into our understanding of risk disclosure effects.

In this regard, consumers are more likely to view that important information is highlighted using various message execution devices such as color, font, size, or location. The risk disclosure prominence effects could be a result of consumers' textual schemata. On the other hand, those who have high DTCA regulatory knowledge may recognize the advertising category must present important risk information and are more likely to look to risk disclosure to make sound health decisions regardless of textual devices. Based on this, DTCA regulatory knowledge could serve as *heuristic inference* cues and will signal consumers' locating of risk disclosure information in DTC ads. When DTCA regulatory knowledge is high, consumers' diagnocity of risk information in DTC ads will be high, and such enhanced diagnocity is more likely to improve cognitive performance regarding locating and memorizing information (Kardes et al., 2004).

On the other hand, DTCA regulatory knowledge, as consumer marketplace persuasion knowledge, will moderate the risk disclosure prominence effects because individuals will have

varying levels of DTCA regulatory knowledge. Among those with high DTCA regulatory knowledge, their superior regulatory and textual schemata regarding risk disclosure presentation will lead to improved search selectivity and memory of risk information, whereas among those with low DTCA regulatory knowledge, varying levels of risk disclosure prominence plays a more important role as peripheral signals or cues (Petty & Cacioppo, 1986) and consumers are more likely to activate their general textual schemata dominantly than regulatory schemata. That is, more prominent risk disclosure is more likely to provoke enhanced search selectivity and thereby improved memory of information. Put differently, among less knowledgeable individuals, a heuristic cognitive path for textual schemata will prevail, such that more prominent disclosure will be easily detected and utilized, whereas less prominent disclosure will be less attended and memorized. Based on the foregoing review of literature, examining the role of DTCA regulatory knowledge will illuminate how consumers' knowledge about the DTCA's regulatory context may improve their DTCA health risk information coping strategies.

The Framework of Dissertation

Conceptualization of Risk Disclosure Prominence in the Literature

It has long been documented that a wide range of advertising message factors affect consumer perception and behavior (e.g., Jackson, 1992; Liebermann & Flint-Goor, 1996; O'Keefe, 2002, 2003; Taylor, 1999). A number of studies have examined whether vivid messages are more effective than non-vivid messages (e.g., Collins, Taylor, Wood, & Thompson, 1988; Frey & Eagly, 1993; Taylor & Thompson, 1982). The literature on message presentation strategies shows that various advertising execution factors can influence consumer

motivation and *ability* to process information, including message specificity (Morris & Millstein, 1984), the amount of information (Tucker & Smith, 1987), the emphasis of risk information (Morris, Ruffner, and Klimberg, 1985), and the completeness of risk information (Davis, 2000). Andrews (1998) notes that these "message factors can play a pivotal role in the processing of disclosure information by consumers" (p. 1). Based on the literature, varying levels of risk disclosure prominence can lead to different communication effects.

There could be various approaches to conceptualize message prominence. For instance, the *location* of the message in an ad may affect consumer perception about the ad (Crowley & Hoyer, 1994; Haugtvedt & Wegener, 1994). Pieters, Rosenbergen, and Hartog's (1996) eye-tracking study found that subjects processed ad headline first, followed by body copy visual among others. This finding implies that information in the top portion of the ad may be more likely to attract viewers' attention than other information elements in the ad (Royne & Myers, 2008). However, Main, Argo, and Buhman (2004) examined print DTC ads and found that risk information was typically presented at the bottom of the ads. In this case, because the relegated risk disclosure is less noticeable, consumer decision making will be based exclusively on information about drug efficacy that is typically presented in a more noticeable portion of ads.

In the context of DTCA risk disclosure, if consumers pay attention exclusively to the medicine's efficacy, they are more likely to dismiss risk information that is central to informed health decisions. Considering that consumers typically do not pay much attention to risk information at the bottom of the DTC ad, the risk disclosure effectiveness will largely hinge on its prominence.

The FDA's Conceptualization of Risk Disclosure Prominence in DTCA

It is worth noting how the FDA conceptualizes risk disclosure prominence and guides pharmaceutical advertisers regarding the development of DTCA risk communication. The FDA (2009) conceptualizes that *disclosure prominence* could consist of various message execution variables rather than a particular message implementing factor. The agency pays attention to consumers' *net impression* as a whole (FDA, 2009). For instance, if a DTC ad presents risk disclosure in smaller, non-bolded font without sufficient surrounding white space, while benefit information is presented in larger bolded font with abundant surrounding white space, this practice may be regarded as *risk-minimizing* or potentially *misleading* (FDA, 2009).

This conceptualization is well represented in the FDA's administrative letters (i.e., *warning* or *untitled* letters) explaining pharmaceutical advertisers' violations of the *fair balance* requirement. These letters signal to the advertisers their violative promotional practices and advise them to release corrective advertising if needed (FDA, 2009). During the period of 1997-2001 the FDA issued between 15 and 25 letters per year, citing DTC promotional materials (US Government Accountability Office; GAO, 2008). From 1997 to 2002, the FDA issued 99 administrative letters (Sheehan, 2003). In addition, from 2002 to 2005, the agency issued between 8 and 11 regulatory letters per year that cited DTC promotional materials (GAO, 2008). Although the GAO points out that the overall number of letters per year has continued to decline, given that the 2002 policy change lengthened the agency's process for issuing letters, it is hard to judge whether pharmaceutical advertisers' misleading or risk-minimizing DTCA practices have continuously decreased. Rather, the GAO (2006, 2008) recommends that the FDA improves their oversight of DTA, by establishing a complete and systematic process for tracking and

prioritizing all materials that the agency receives for review.

Among various problematic DTCA practices, a number of letters state that the promotional materials for prescription drugs employed message techniques that are likely to minimize consumers' risk perception about the medicine through a wide range of message presentation formats (Sheehan, 2003). More importantly, even when the ads presented required risk information, they appeared to fail to provide sufficient prominence of risk disclosure comparable with that of benefit information (Sheehan, 2003). This is undesirable given that imbalanced emphasis on benefit information is likely to relate to unrealistic perception about the medicine's efficacy, while leading consumers to disregard potential health risks of the drug (An & Muturi, 2011). To address this public health concern, the current research builds on the FDA's conceptualization of risk disclosure prominence and operationalizes disclosure prominence as a combination of various message factors that are selected from the FDA's (2009) draft guidance of DTCA risk communication.

To be more specific, the FDA (2009) lays out major risk minimizing message techniques in their draft guidance, titled "Presenting Risk Information in Prescription Drug and Medical Device Promotion." This guidance states that promotional materials are misleading if they fail to present information about risks associated with a drug with a *prominence* reasonably comparable to the presentation of information related to the effectiveness of the drug.

In particular, the FDA takes into account "all implementing factors such as typography, layout, contrast, headlines, paragraphing, white space, and any other techniques apt to achieve emphasis" (21 CFR 202.1(e)(7)(viii)). To encourage consumers to make informed prescription decisions, it is critical to make consumers pay sufficient attention to risk disclosure as well as

information about the drug's efficacy or uses. Further, the information should be properly recalled or recognized in their decision making situations. Depending on how advertisers use the above message techniques to present risk disclosure, prominence can be differently operationalized. In this research, two levels of disclosure prominence is operationalized to represent high and low prominence, using the techniques outlined by the FDA (2009).

In sum, the Code of Federal Regulation (21 CFR 202.1) and the FDA's draft guidance for prescription drug promotion (FDA, 2009) clearly document how risk information as well as benefit information can be developed to be noticeable so that consumers are able to pay sufficient attention to both information with similar ease. Based on the foregoing discussion, in the following section the theoretical background and operationalization of DTCA risk disclosure prominence are addressed.

The Study

Risk Disclosure Prominence as a Message Factor (Main Effects)

To secure intended risk disclosure effectiveness, DTCA designers should consider persuasion sequences including *exposure*, *processing*, and *action* (Bettman et al., 1986; Wogalter, Conzola, & Smith-Jackson, 2002). In particular, as to advertising execution factors, DTCA researchers have paid attention to the exposure stage because attracting consumers' *attention* to risk disclosure is the first step for effective advertising campaigns (Hoek et al., 2011).

A couple of theoretical perspectives on consumer information processing provide convincing explanations regarding the importance of risk disclosure prominence. First of all,

selective attention research suggests that human information processing capacity has limitations and therefore consumers tend to select and focus more on particular portion of the message at a time (e.g., Bettman et al., 1986; Lavie, 2001; Mayer & Moreno, 2003; Miller, 1994; Paas, Renkl, & Sweller, 2004).

Regarding DTCA, these cognitive limitations are more likely to be found. Compared with health professionals, novice consumers will have limited medical knowledge. For this reason, negative medical information presented less prominently is more likely to result in information avoidance. In general, prescription drug advertising presents more difficult medical information compared with over-the-counter (OTC) drugs (Andrews, 1998). Based on this, less knowledgeable consumers are more likely to selectively attend particular information in the DTC ad to reduce cognitive overload (Alba & Hutchinson, 1987).

This implies that information that causes cognitive overload in DTCA may result in biased *net impression* about the medicine (Hoek et al., 2011). To ordinary consumers, less prominent risk disclosure is likely to cause cognitive fatigue because it requires consumers to exert more efforts to find and focus on the less legible messages (Davis, 2010). More prominent disclosure could encourage less knowledgeable consumers to closely scrutinize DTCA risk information (Wilkie, 1986).

Depending on risk disclosure prominence, ease of processing may vary. This study examines perceived attention as a proxy measure of objective attention. As cognitive fluency is likely to be affected by prominence (e.g., Hyönä & Lorch, 2004; Lorch, Lorch, & Inman, 1993; Loman & Mayer, 1983; Spyridakis & Standal, 1987), perceived attention to risk disclosure will be also increased by high prominence. Further, perceived attention will lead to increased recall

and recognition performance. In this regard, this research addresses risk disclosure prominence as an important message factor regarding consumers' informed prescription decision making.

Operationalization of Risk Disclosure Prominence

A couple of typographical devices are utilized to operaionalize risk disclosure prominence of DTCA. Those factors include text color, title, font size, bold texts, box outline, and location based on the FDA's (2009) risk communication draft guidance. To be more specific, to manipulate the risk disclosure prominence, this research employs a couple of attention signaling cues. *Signaling* can be defined as the use of typographical devices designed to highlight aspects of a text's structure or content without altering the information in the ad (Lorch et al., 1993).

Among others, most widely employed signaling devices may include *headlines* or *subheads* (Hyönä & Lorch, 2004). The FDA (2009) requires that pharmaceutical promotional materials use appropriate typographical signals consistently across benefit and risk information to foster accurate and non-misleading impressions about the drug. Furthermore, the literature suggests that product warnings need to employ vivid colors and noticeable font sizes, and use any symbols to summarize and reinforce key warning details, which would help consumers easily locate risk information (Bettman et al., 1986).

In a similar vein, Argo and Main (2004) conducted a meta-analysis and found that vivid color such as *red* enhances consumer attention to risk information. In addition, physical location of risk information may affect message prominence (Hoek et al., 2011). For instance, risk information close to benefit information was found to be more noticeable than risk information near the bottom of a print ad (Torres, Sierra, & Heiser, 2007). Texts with frame lines were also

found to be superior to texts without outlines in leading attention to information and retaining memory for short periods (Bettman et al., 1986; Hoek et al., 2011; Wogalter et al., 2002; Wogalter & Shaver, 2001).

In this dissertation, based on the FDA's (2009) draft guidance, the previous literature on risk disclosure presentation, and the preliminary analysis of hundreds of DTC ads, the attention-enhancing factors were selected, including the use of cueing signals (i.e., bullet points, bold texts, capitalized first words), use of color (i.e., red), boxed frame lines, larger font sizes, and position of texts (i.e., close to use and benefit information vs. bottom of the ad). In contrast, the less prominence condition is manipulated as disclosures using no bullet points, no bold texts, no capitalization of first words, no red color, no box lines, smaller font sizes, and relegation toward the bottom of the ad page.

Research Hypotheses

Perceived Attention to Risk Disclosure

Researchers consider *attention* an important cognitive process that affects consumers' decision making outcomes (Lynch & Srull, 1982). However, it is worthy to note selective aspects of attention. Regarding risk disclosure, physically salient information in the environment is more likely to capture a disproportionate amount of attention (Taylor & Fiske, 1978). Given this, consumers' attention to DTCA risk disclosure may play a role in leading them to discuss the risks of taking the drug with their doctors (Menon, Deshpande, Perri III, & Zinkhan, 2003).

More specifically, in the context of risk communication in advertising, attention has been noted as an important early stage of hierarchy-of-effects communication models (Krugman et al,

1994). Although risk disclosure has become a common phenomenon in the contemporary information environment (Mazis, Morris, & Swasy, 1991), surprisingly few empirical studies have assessed its effectiveness in the DTCA context. Advertising research has reported that mere advertising exposure itself is not always effective for promoting intended consumer response to the ad (Goodrich, 2011). Consumer attention to ad information needs to be secured and different ad stimuli (e.g., ad type, ad location, and page type) can affect varying attention levels (Goodrich, 2011).

There could be various ways to conceptualize and measure attention (i.e., behavior observation, psychophysiology, and self-reports), and each approach has their own methodological pros and cons (Reeves & Thorson, 1986; Thorson, Chi, & Leavitt, 1992). One of the commonly employed measurement approaches to attention is introspective self-observation (i.e., self-reported) (Chaffee & Schleuder, 1986). In particular, given that more often than not resources and instruments for objective measures of attention are not available to researchers, the simplest and available way to assess attention is self-reports (Reeves & Thorson, 1986; Thorson et al., 1992), referred to as *perceived attention* or self-reported weight of watching. In this regard, despite criticism that perceived attention has limitations for measuring actual attention, as an alternative proxy measure of attention, researchers have often employed the subjective measure (e.g., Thorson et al., 1992).

The use of self-reported perceived attention can be justified from the cognitive inference literature. Although consumers' self-beliefs about a particular phenomenon is seldom complete or errorless, consumer research on meta-knowledge has found that their subjective or perceived judgment plays an important role in cognitive inference processes (Alba & Hutchinson, 2000).

This has been often labeled as *cognitive heuristics* (Kardes et al., 2004). Therefore, although perceived attention measure cannot represent an ideal approach to assessing objective attention, the utility of it has been acknowledged (e.g., Reeves & Thorson, 1986; Chaffee & Schleuder, 1986; Thorson et al., 1992). In particular, Chaffee and Schleuder (1986) note that the subjective attention measures are notable for their utility and general validity than for their reliability and precision. Given the literature, with rigorous theoretical underpinning and careful caution in interpreting the research findings, perceived attention measure, as a proxy measurement approach, can provide consumer researchers with usability to better understand the phenomenon of consumer attention to advertising. Further, if the researcher employ other theoretically relevant construct measures simultaneously, the construct (e.g., convergence validity) validity or criterion validity (e.g., predictive validity) can be assessed. Based on the consideration of these various methodological issues and limitations, the current research in that regard employs a self-reported perceived attention measure (see the method section for more information).

Taken together, for consumers to make sound prescription decisions, risk disclosure information should be attended so that they can utilize the information reasonably. Prominent risk disclosure in a DTC ad may prime important product attributes such as potential health risks, adverse reactions, and contraindications, and thereby make risk information more accessible from memory (Menon et al., 2003a). Varying levels of risk disclosure prominence are predicted to result in disproportional levels of attention. Higher prominence disclosure are more likely to lead to higher consumer attention to risk disclosure than lower prominence disclosure. Based on the review of literature on prominence and attention, the following hypothesis can be raised:

H1: Higher risk disclosure prominence will lead to greater perceived attention to

risk disclosure.

Recall and Recognition of Risk Disclosure

Advertising exposure has an impact on consumers' recall and recognition (Okechuku, 1992; Pechmann & Stewart, 1990; Rosbergen, Pieters, & Wedel, 1997; Shapiro & Krishnan, 2001). Although these two cognitive measures have been widely employed in the advertising literature, the measures of recall are often criticized because they may underestimate advertising effectiveness under low levels of cognitive elaboration conditions (Petty et al., 1983). In general, a recall test involves a situation where a subject must independently retrieve previously acquired information (e.g., subjects are asked to list all product attributes learned from an ad). On the other hand, in a recognition test, subjects are given a list of choices and must indicate which one was previously presented in the ad. However, Due to the different cognitive task difficulties between the two methodological approaches, in general recall score is reported as lower than recognition score (Lynch & Srull, 1982), implying that statistical variations in recall tests might be minimal. Nevertheless, the use of recall measure for advertising effectiveness can represent the levels of cognitive elaboration devoted to processing information, indicating active cognitive processing (Lord & Burnkrant, 1993).

Given the advantages and disadvantages of the two memory measures, cognitive psychology suggests that one of the most simple and parsimonious approach to measure information retrievability takes a two-stage process, where subjects must independently retrieve information (i.e., unaided recall) and then perform some recognition check on whether the item was presented in a particular context (i.e., aided recognition), referred to as the *generation-*

recognition theory (Lynch & Srull, 1982). Researchers are advised to employ recognition measures to complement the limitations of the recall measure in advertising message research (Okechuku, 1992). In this regard, the current research adopts the generation-recognition approach to assess consumer risk information retrievability.

There are robust findings that information organization is important for memory performance (Lynch & Srull, 1982). Some organizational formats may facilitate the retrieval fluency and, therefore, information presentation formats are important for memory-based judgments (Lynch & Srull, 1982). Greater attention to information is more likely to lead to greater focus on product's facts and objective attributes (Alba & Hutchinson, 1987; Lynch & Srull, 1982; Okechuku, 1992; Park & Lessig, 1981) and such increased focus on information may lead consumers to memorize more details of the information.

Therefore, when the consumer takes a memory test, more prominent risk disclosure will lead to higher recall and recognition scores (Lynch & Srull, 1982). In the context of DTCA, examining recall and recognition of the drug's health risks may provide important educational implications (e.g., Davis, 2010). Based on the literature, the following research hypotheses can be raised:

H2: Higher risk disclosure prominence will lead to greater recall of health risk information.

H3: Higher risk disclosure prominence will lead to greater recognition of health risk information.

DTCA Regulatory Knowledge as a Consumer Factor (Main Effects)

Another important factor that may affect DTCA risk disclosure processing in the current research is consumers' individual differences in DTCA regulatory knowledge. Depending on individuals' unique cognitive schema, their coping strategies of health information in DTCA will vary. Consumer behavior models have described knowledge as an individual difference variable affecting all phases of the decision process, especially information search (Beatty & Smith, 1987; Brucks, 1985; Moorman, Diehl, Brinberg, & Kidwell, 2004). A number of researchers have examined the impact of knowledge on decision making (e.g., Alba & Hutchinson, 2000; Ellen, 1994; House et al., 2004; Park, Mothersbaugh, & Feick, 1994). In the same token, the PKM literature suggests that marketplace knowledge can affect consumer information processing of marketing messages (Friestad & Wright, 1994). From the PKM perspective (Friestad & Wright, 1994), DTCA regulatory knowledge can be viewed as one type of consumer marketplace beliefs in the DTCA context. Knowledge about a particular advertising category is expected to exert considerable influence on consumers' information coping strategies (Boush et al., 2009; Obermiller & Spangenberg, 1998) and therefore DTCA regulatory knowledge may affect DTCA information coping strategies.

As noted, in contemporary marketplace, consumers face a huge amount of persuasive messages and might have been socialized to develop certain beliefs or cognitive structure regarding such influence attempts (Boush et al., 2009; Darke & Ritchie, 2007). In order to protect their own interests, consumers employ such beliefs or cognitive structure in their information processing, referred to as *epistemic doubt*, and act as reasonable consumers in the market (Boush et al., 2009; Darke & Ritchie, 2007; Friestad & Wright, 1995, 1999). Given this,

consumers' use of DTCA risk disclosure may be affected by such cognitive structure.

Research on consumers' knowledge of a product category has a long history in consumer research due to its effects on consumers' decision making process (Engel, Blackwell, & Miniard, 1990). Since Brucks (1985) described three categories of consumer knowledge including subjective knowledge that is what the consumer thinks he or she knows, objective knowledge that is measured by some type of test, and prior experience with the product category, many scholars have examined this construct (e.g., Alba & Hutchinson, 1987; Flynn & Goldsmith, 1999). In addition, Peter, Olson, Grunert (1999) described that consumers have four levels of product knowledge, including product class, product form, brands, and models.

However, given all this research attention, it is surprising that little research has addressed the conceptualization and measurement of it in the context of DTCA. In particular, despite attention on product category knowledge or issue knowledge, consumers' cognitive structure regarding a particular advertising category's regulatory context has been largely ignored in the DTCA literature. To better understand the impact of DTCA on consumers, researchers should examine not only its message aspects, but relevant consumer aspects such as individual differences in DTCA regulatory knowledge structure (Sheehan, 2007).

As part of a broader set of marketplace beliefs, the current research referred *DTCA regulatory knowledge* to as "a set of cognitive structures about the FDA's general control over DTCA, the FDA's involvement with DTCA content and design, the ad category's developmental and approval process, and the FDA's involvement with DTCA research." Despite a possibility to conceptualize DTCA regulatory knowledge in different ways, given a dearth of prior research on this construct in the DTCA literature, the current research will be the first step for further

examination.

To develop a practical and valid measurement scale, this research adopts the measure items of DTCA regulatory knowledge from the FDA's (2014) current page for consumer health education (i.e., *For Consumers & Patients*). This could have a couple of practical implications. First, the items represent actual consumers' curiosity about the DTCA category. Low knowledge score could represent low levels of regulatory understanding for DTCA, whereas high knowledge score could represent reasonable understanding of the advertising category's regulatory context. Second, the answer to each item reflects the FDA's current thoughts and regulations about the DTCA category. Therefore, employing those items will provide practical insight into consumer education by the FDA and DTCA marketers.

In general, knowledge about an advertising category enables consumers "to recognize, analyze, interpret, evaluate, and remember persuasion attempts and select and execute coping tactics believed to be effective and appropriate" (Friestad & Wright, 1994, p. 3). Given this presumed role of knowledge, consumers' DTCA regulatory knowledge may serve as cognitive reference points for DTCA risk disclosure coping strategies. Consumers may be more or less motivated and/or able to process disclosures in DTCA, depending on varying levels of DTCA regulatory knowledge, because risk disclosure is part of regulatory requirement by the FDA.

Research supports this theoretical prediction. In general, consumer responses to the ad are affected by individual differences in consumers' *motivation* and *ability to process* information (Kavadas et al., 2007; Petty, Cacioppo, & Schumann, 1983). Research on *systematic-heuristic inference* (Chaiken & Eagly, 1989) and *elaborated likelihood model* (ELM) (Petty & Cacioppo, 1986) provides plausible explanations; cognitively more capable and motivated individuals are

less affected by peripheral message factors such as information source (Petty et al., 1983) or presentation formats (Artz & Tybout, 1999), whereas less capable and motivated individuals are more affected by such factors.

In addition, through the notion of *consumer expertise,* Alba and Hutchinson (1987) argue that higher consumer expertise tends to improve cognitive task performance regarding complicated information processing that requires cognitive resources. More knowledgeable consumers' ability to process and utilize relevant information in decision making may be superior to that of less knowledgeable ones (Alba & Hutchinson, 1987). The preceding review of literature suggests the following research hypotheses:

H4: Higher DTCA regulatory knowledge will lead to greater perceived attention to risk disclosure.

H5: Higher DTCA regulatory knowledge will lead to greater recall of health risk information.

H6: Higher DTCA regulatory knowledge will lead to greater recognition of health risk information.

DTCA Regulatory Knowledge as a Consumer Factor (Moderating Effects)

Further, DTCA regulatory knowledge is expected to moderate the risk disclosure prominence effects. As has been discussed, individuals tend to select a more efficient cognitive path to reduce cognitive overload (Bettman & Zins, 1979; Wright, 1975). Given this theoretical premise, a concern is raised when DTCA presents disclosures in less prominent or less accessible formats. In general, DTCA provides medical information that requires more cognitive efforts (Macias et al., 2007; Royne & Myers, 2008). For instance, Sheehan (2006) examined the language of DTCA to determine whether DTCA language is easy to read and understand. She

found that DTCA ads are among the most difficult ads. In particular, processing information that discusses the drug's risks and contraindications is considered one of the most challenging cognitive tasks to novice consumers (Sheehan, 2006). Considering this nature of DTCA risk disclosure, more prominent risk disclosure provision will help low DTCA regulatory knowledge consumers locate and utilize risk information more fluently, because such message format is expected to reduce cognitive efforts required to process hard-to-read risk information whereby it improves information search selectivity. In contrast, higher DTCA regulatory knowledge may relate to higher cognitive capacity to search and utilize DTCA risk information, and therefore higher DTCA regulatory knowledge consumers may better perform cognitive tasks regardless of varying levels of risk disclosure prominence, indicating minimal prominence effects for higher DTCA regulatory knowledge consumers.

Further supports for the moderating influence of DTCA regulatory knowledge on the risk disclosure prominence effects can be found from the *self-consistency* hypothesis (Moorman et al., 2004). In general, when consumers perceive themselves as knowledgeable about a particular category, they are more likely to locate themselves proximate to information associated with that knowledge (Moorman et al., 2004). Extending this, consumers who are more knowledgeable about the FDA's regulatory role for DTCA are more likely to be motivated and/or able to process risk disclosure required by regulation, because those with high DTCA regulatory knowledge will be more proficient with locating and utilizing risk disclosure in DTCA, referred to as high *search selectivity* (Moornan et al., 2004). Put simply, higher DTCA regulatory knowledge is more likely to be associated with higher search selectivity for risk disclosure in DTCA. This enhanced cognitive fluency will enable more knowledgeable consumers to attend and memorize

disclosures easily and therefore they will be less sensitive to risk disclosure prominence.

In contrast, as to low DTCA regulatory knowledge consumers, their limited cognitive resources will result in more reliance on risk disclosure prominence to reduce their cognitive burden required for locating and processing risk disclosure to improve *cognitive efficiency*. When risk disclosure is presented more prominently, those with low DTCA regulatory knowledge will be more capable of attending and memorizing risk information, whereas when risk disclosure is presented less prominently, they will be less capable of locating and memorizing risk information.

Taken together, DTCA regulatory knowledge may moderate the risk disclosure prominence effects on consumer response to the ad. Those with low DTCA regulatory knowledge may rely more on disclosure prominence, such that more prominent disclosures are more likely to attract low knowledge consumers' attention to risk disclosure, and thereby lead to enhanced memory of health risk information, including recall and recognition. In contrast, among high DTCA regulatory knowledge consumers, the prominence effects will be diluted, because highly knowledgeable consumers' search selectivity and memory performance will be consistently high across varying levels of prominence. Therefore, the following hypothesis can be raised:

H7: DTCA regulatory knowledge will moderate the risk disclosure prominence effects on: (a) perceived attention to risk disclosure; (b) recall; and (c) recognition of health risk information, such that low DTCA regulatory knowledge consumers will show greater prominence effects, whereas high DTCA regulatory knowledge consumers will show minimal prominence effects.

The Mediating Role of Perceived Attention (Mediating Effects)

The foregoing sections address that certain formats and methods for presenting information can affect consumers' perceived ease with information processing. For this reason, Bettman, Payne, and Stalein (1986) suggest that advertisers need to present product information in a way to reduce consumers' cognitive effort/time required to locate and retrieve information. As a proxy measure of objective attention, perceived attention represents one type of indicator for cognitive fluency and examining this construct may provide insight into through what mechanism the effects of DTCA regulatory knowledge, risk disclosure prominence, and their interplay on consumer information retrievability operates.

In general, higher attention is expected to lead to greater memory of information (Goodrich, 2011). This is because more intensively attended and encoded information is more likely to be retrieved from memory (Pieters, Warlop, & Wedel, 2002). In this regard, some researchers view that enhanced information readability in terms of design can improve memory performance of the ad and brand (Moore, Stammerjohan, & Coulter, 2005). Therefore, attention to elements in advertising has been suggested as an important mediator of subsequent advertising effectiveness outcomes, including recall, attitudes, and purchase intentions (Mackenzie, 1986) and knowledge obtained from the ad (Chaffee & Schleuder, 1986).

Extending this perspective to the context of DTCA regulatory knowledge, enhanced perceived attention resulting from higher DTCA regulatory knowledge and prominent risk disclosure may also strengthen subsequent memory performance of risk information, and further the interactive effects between DTCA regulatory knowledge and risk disclosure prominence will be mediated through perceived attention on memory. In particular, given the moderating role of

DTCA regulatory knowledge on the prominence effects, it is speculated that the mediating role of perceived attention will be substantial for the prominence effects among low DTCA regulatory knowledge consumers, whereas the mediating effects of perceived attention for the prominence effects will be diluted among high DTCA regulatory knowledge consumers, indicating a moderated-mediation relationship.

Based on the foregoing discussion, perceived attention may mediate the effects of DTCA regulatory knowledge, risk disclosure prominence, and their interactive effects on consumers' memory performance such as recall and recognition (Bettman et al., 1986; Sheehan, 2007). Therefore, the following hypotheses can be raised:

H8: Perceived attention to risk disclosure will positively mediate the effects of risk disclosure prominence on consumer (a) recall and (b) recognition of health risk information.

H9: Perceived attention to risk disclosure will positively mediate the effects of DTCA regulatory knowledge on consumer (a) recall and (b) recognition of health risk information.

H10: Perceived attention to risk disclosure will positively mediate the interactive effects of risk disclosure prominence and DTCA regulatory knowledge on consumer (a) recall and (b) recognition of health risk information.

The research hypotheses of the current research are summarized in Table 1. In addition, the conceptual framework of the research is illustrated in Figure 1.

Table 1. Summary of Research Hypotheses

Risk Disclosure Prominence Main Effects:
H1: Higher risk disclosure prominence will lead to greater perceived attention to risk disclosure.
H2: Higher risk disclosure prominence will lead to greater recall of health risk information.
H3: Higher risk disclosure prominence will lead to greater recognition of health risk information.
DTCA Regulatory Knowledge Main Effects:
H4: Higher DTCA regulatory knowledge will lead to greater perceived attention to risk disclosure.
H5: Higher DTCA regulatory knowledge will lead to greater recall of health risk information.
H6: Higher DTCA regulatory knowledge will lead to greater recognition of health risk information.
Moderating Effects of DTCA Regulatory Knowledge:
H7: DTCA regulatory knowledge will negatively moderate the risk disclosure prominence effects on consumer response to the ad; such that low DTCA regulatory knowledge consumers will report higher (a) perceived attention to risk disclosure, (b) recall, and (c) recognition for high prominence risk disclosure than for low prominence risk disclosure, whereas high DTCA regulatory knowledge consumers will show minimal prominence effects.
Mediating Effects of Perceived Attention:
H8: Perceived attention to risk disclosure will positively mediate the effects of risk disclosure prominence on consumer (a) recall and (b) recognition of health risk information.
H9: Perceived attention to risk disclosure will positively mediate the effects of DTCA regulatory knowledge on consumer (a) recall and (b) recognition of health risk information.
H10: Perceived attention to risk disclosure will positively mediate the interactive effects of risk disclosure prominence and DTCA regulatory knowledge on consumer (a) recall and (b) recognition of health risk information.

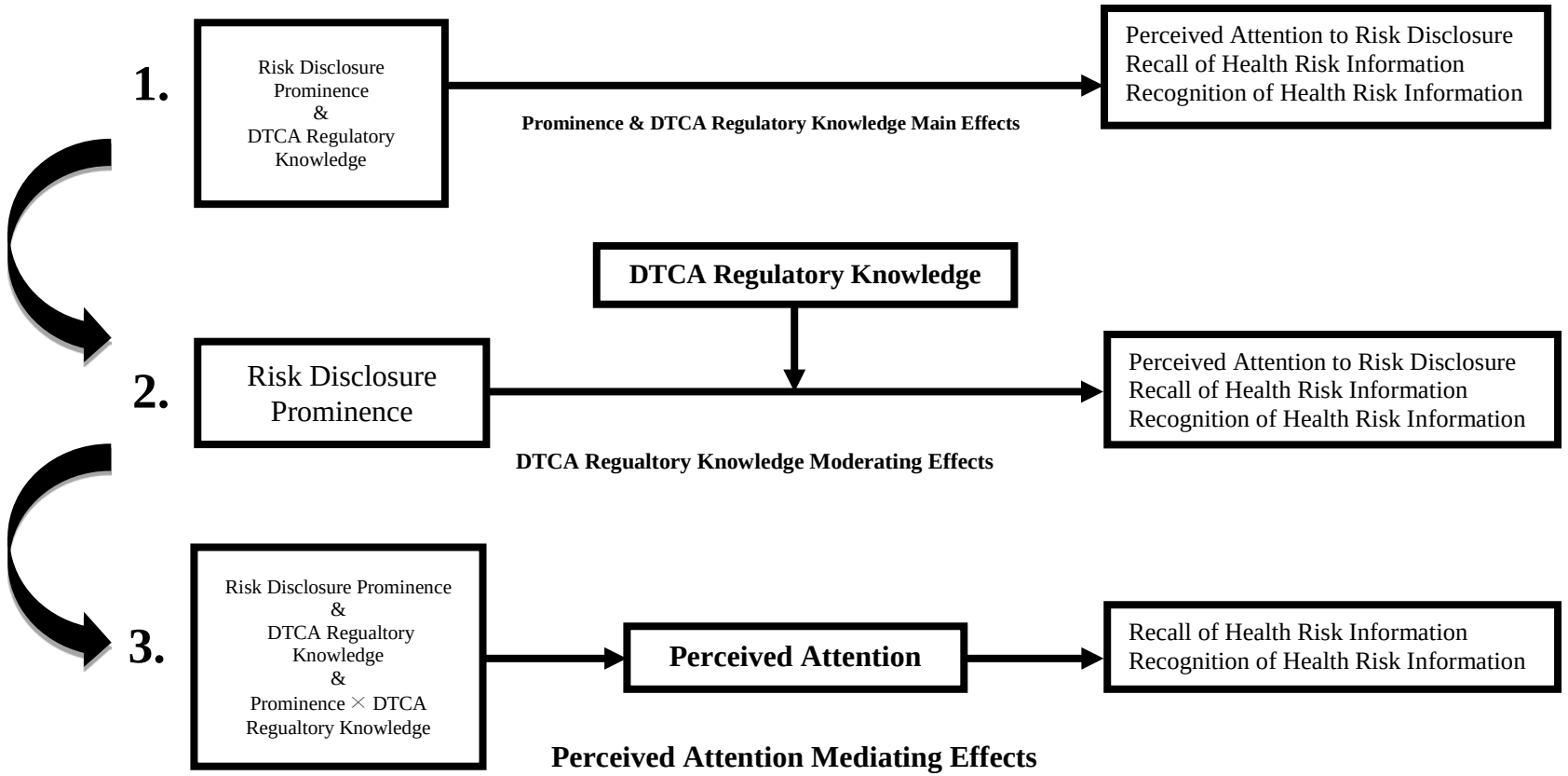

Figure 1. The Conceptual Framework of Dissertation

CHAPTER 3: METHOD

Procedure and Sample

Prior to the data collection, pretests were undertaken to ensure subjects' understanding and readability of the research instrument questions. In addition, the subjects in pretests served as the function of manipulation check groups (Perdue & Summers, 1986; Wetzel, 1977) to examine whether risk prominence was operationalized in a proper way. The test ads were reviewed by one advertising professor and three other communication professors. Based on their recommendations, the ad manipulations were revised several times to secure intended operationalization of ad stimuli.

Then, confusing wording and unclear instructions were revised until the questionnaire is became clear and easily understood. The main experiment manipulated the prominence of risk disclosure by employing a set of message execution factors according to the FDA's (2009) risk communication guidance. To ensure less-biased research findings, random sample assignment and statistical control of potential covariates were utilized according to the suggested experimental research approach (Goodwin, 2008; Shadish, Cook, & Campbell, 2002). Further, this approach has been also suggested in the health communication literature (e.g., An, 2007, Park, Ju, & Kim, 2013; Ju & Park, 2013). Two different test ads were created for a fictitious antidepressant brand (i.e., Luminexell) because mental depression is among major undertreated social diseases (FDA, 2014) and a fictitious brand can exclude alternative explanations in interpreting the findings (Shadish et al., 2002) (see the manipulation development section for more information).

A US adult sample was obtained from a professional online consumer panel, Qualtrics. A

set of factors recommended the use of online consumer panel to conduct this research. First, it was an efficient way to reach relatively representative US adults. Second, the Internet access has been grown rapidly and the generation gap has been continuously narrowed. Third, to enhance the validity of the research, some of the questions were randomized to counterbalance any potential order effects. In particular, regarding random sample assignment, the faster and easier data collection allowed the researcher to better conduct research. Fourth, the Qualtrics consumer panel software provides promising response validation check features, including *attention filters* and *average time duration screen out*. There are many factors that may lead to respondent fatigue. One way to reduce the number of "straight-liners" and "speeders" is to insert attention filters into the survey. These questions verify respondents are reading the questions carefully and are following instructions. The most common type of attention filters is asking respondents to answer to "This is an attention filter. Please select "Strongly Disagree" for this statement." If the respondent did not follow the instruction, the response was excluded from the results.

In the same manner, to control the minimum time to submit the questionnaire, the researcher can enforce 1/3 of the average survey duration found during the pilot test phase. If there are respondents who attempt to take the survey in less than 1/3 the average time, the responses were removed from the results. Furthermore, to ensure the measurement validity of recall and recognition of risk disclosure, respondents were not allowed to go back to the previous pages to see the ad again.

Regarding the online survey procedure, the online consumer panel members received an e-mail announcement containing a brief description of the study with a link to the survey. The first page of the survey showed consent form and asked if the respondents are at least 18 years

old to participate according to the Institutional Research Board (IRB) protocol. The first page ensured the purpose of the study broadly and assured anonymity.

By clicking the URL, the panel members directly logged on to the survey site. Subjects who agreed proceeded to the survey. By the survey software, subjects were randomly assigned to one of the manipulated treatment conditions. After answering some pre-measures including DTCA regulatory knowledge measures, subjects were shown an antidepressant ad on the screen. After viewing the ad, subjects completed manipulation check items and major dependent measures. At the end of the survey, basic demographic information was asked.

More specifically, at the pre-measure stage, the instrument first measured potential correlates (i.e., overall subjective health status, perceived importance of the disease, perceived familiarity with the disease, and previous experience with the disease) and DTCA regulatory knowledge.

Considering the artificial nature of the experiment, subjects were asked to read the ads the same way as they would if they were at risk of mental depression in their real life. After the subjects read the ad, they were asked to complete manipulation check items and dependent measures. The survey duration mean was approximately 14 minutes to complete. The number of

participants amounted to 264[1] that is a fairly sufficient sample size for the current research design and the number of dependent variables.

A number of sources were considered to obtain a sample of adult consumers from diverse demographic backgrounds. A convenience sample of 264 consumers were registered members of the panel. The overall demographics consist of a random spread across the US. Though it was not specifically mirroring the US census, the sample had a diverse representation. Specifically, the sample represented diverse demographic background. Among the respondents (N = 264), 63.6% were males and 36.4% were females. The respondents ranged in age from 18 to 77 years (M = 30.03, SD = 13.73). Among them, 43.9% were younger adults (18–44 years), 45.1% mature adults (45–64 years), and 11% older adults (65 years or older). The majority were whites (79.5%), followed by Black, not Hispanic (13.3%), Hispanic, of any race (4.5%), Asian or Pacific Islander (1.1%), and American Indian, Eskimo, or Aleut (.8%).

In terms of respondent education, 27.7% of respondents attended some college education

[1] The researcher originally collected the data from 420 individuals assigned to three conditions of disclosure prominence. One of them was a condition designed for an exploratory purpose to be compared with the low prominence condition. Since responses from the exploratory condition did not differ from the low prominence condition, subjects in the former group were excluded from further analysis.

without degree, followed by respondents completed high school but no college education (25.0%), bachelor's degree (17.8%), and associate's degree (13.3%). The majority of respondents had an annual household income of $25,000 to $99,999, with 62.1% reporting. In addition, most respondents (87.9%) used laptop or desktop computers to participate in the survey. The sample of this research is illustrated in Table 2.

It is worthy to note that 29.9% (n = 79) of the sample reported having been diagnosed with clinical depression. Considering that an estimated 1 in 10 US adults reports current depression (Center for Disease Control and Prevention, 2010), the current study's sample may over-represent the US adult population with depression experience. However, it is worth noting that the survey instrument of the current study asks subjects to report their previous experience with depression up to now. Given that the Center for Disease Control and Prevention (2010) reports the current depression diagnosis (approximately 10%), it is possible to speculate that subjects' reported accumulative depression experience rate (approximately 30%) would be higher than the current depression rate reported. That is, because subjects' response in the current research may represent not only current depression experience but also a whole personal history of depression in their lifetime. Therefore, with careful caution, the higher depression experience report of this research than that of the current epidemiological data seems to be understandable.

Design

Because the current study has one manipulated categorical variable with two levels (i.e., high vs. low prominence) and one measured continuous variable (i.e., DTCA regulatory knowledge) along with control variables, a multiple regression approach was employed to probe

the research hypotheses (Aiken & West, 1991; Fitzsimons, 2008). The current study did not dichotomize the continuous DTCA regulatory knowledge levels (e.g., 0-6) into two categories such as high and low. Fitzsimons (2008) notes that median-splitting of a continuous independent variable has principal problems. First, dichotomizing continuous independent variables are likely to unnecessarily reduce the statistical power available to test research hypotheses (Irwin & McClelland, 2003). Second, a more serious potential problem is that inappropriate dichotomization of continuous variables can create spurious significant results if the independent variables are strongly correlated (Maxwell & Delaney, 1993). Third, inappropriate dichotomy of the data is likely to loss important information by disregarding meaningful differences among varying continuous levels (Fitzsimons, 2008). In this regard, Fitzsimons (2008) suggests to follow a guide to performing analysis including continuous independent variables and interactions proposed by Aiken and West (1991).

More specifically, when there are one straightforward manipulation of independent variable and one measured continuous variable that is not easy to manipulate at the individual consumer level or not appropriate for manipulating due to its nature such as pre-existing cognitive traits, the researcher needs to decide whether he/she uses a continuous measure as it is, to capture varying levels of the measured variable (Fitzsimons, 2008). However, more often than not, when the researcher is interested in testing the interaction between the two independent variables, a common mistake committed by the researcher is dichotomizing the measured variable into two levels using a median-split method. However, this approach may be inappropriate and possibly result in misleading interpretations of the results (Fitzsimons, 2008).

To address these limitations, Aiken and West (1991) suggest to perform regression

analyses to utilize the continuous nature of the measured independent variable. Further, when the researcher analyzes the interaction between one manipulated categorical variable and one measured continuous variable, the *Johnson-Neyman regions of significance procedure* is suggested as well as a *simple slop analysis* (Aiken & West, 1991; Preacher, Rucker, & Hayes, 2007). For instance, the *Johnson-Neyman* procedure shows where the subgroups' (e.g. high vs. low) regression slopes and intercepts are significantly different from one another across varying levels of the measured variable. The regression slopes and intercepts can be plotted in graph and the statistics of the method indicate the regions of significance. To further pinpoint the interaction pattern, the simple slope analysis allows the researcher to examine the slopes of the manipulated variable at each level of the measured variable. In the current research context, for instance, the simple slope analysis shows whether the regression slopes are significantly different between the two different manipulation conditions, at one standard deviation below the mean of the measured variable, at the mean of the measured variable, and at one standard deviation above the mean of the measured variable, (Aiken & West, 1991).

When the researcher addresses moderated mediation hypotheses, the use of the simple slopes method and Johnson-Neyman technique are suggested as a rigorous and appropriate analysis approach (Preacher et al., 2007). Further, to examine the mediating hypotheses, asymptotic (i.e., interpreting confidence intervals) and resampling (e.g., 5,000 resamples) strategies for assessing and comparing indirect effects, referred to as the *bootstrap approach,* are suggested as a rigorous contemporary analysis (Preacher & Hayes, 2008). Taken together, given the aforementioned methodological considerations and suggestions by methodologists, the researcher judged that the use of multiple regressions, along with Johnson-Neyman procedure,

the simple slopes method, and the bootstrap approach are appropriate for probing the research hypotheses of the current research.

Table 2. The Sample Profile of Study Respondents (*N* = 264)

	N	%
Gender		
Male	168	63.6%
Female	96	36.4%
Age		
45-64	119	45.1%
18-44	116	43.9%
65 and older	29	11%
Ethnic Background		
White, not Hispanic	210	79.5%
Black, not Hispanic	35	13.3%
Hispanic, of any race	12	4.5%
Asian or Pacific Islander	3	1.1%
American Indian, Eskimo, or Aleut	2	.8%
Education		
Some college education but no degree	73	27.7%
Completed high school but no college education	66	25.0%
Bachelor's degree (examples: BA, BS)	47	17.8%
Associate's degree (examples: AA, AS)	35	13.3%
Master's degree (examples: MA, MBA)	21	8.0%
Attended graduate school but no degree	8	3.0%
Did not finish high school	6	2.7%
Doctorate degree (examples: PhD, EdD)	7	2.3%
Professional degree (examples: JD, MD)	1	.4%
Annual Household Income		
$25,000 ~ $49,999	75	28.4%
Lower than $25,000	73	27.7%
$50,000 ~ $74,999	66	25.0%
$75,000 ~ $99,999	23	8.7%
$100,000 ~ $149,999	18	6.8%
$150,000 or higher	9	3.4%

Manipulation of Independent Variable: Prominence

Pretests and Manipulation Checks

Antidepressant ads for a fictitious brand were generated to exclude potential biases from prior experience or perception regarding the brand. The current study focuses on mental depression because it represents one prevalent but undertreated health issue among US adults (Gonzales, Tarraf, Whitfield, & Vega, 2010; Kessler et al., 2003; Rosenthal, Berndt, Donohue, Frank, & Epstein, 2002). The Centers for Disease Control and Prevention (2014) indicates that each year approximately 10% of US adults aged ≥ 12 years reported current depression during a period of 2007-2010. Examining consumers' response to an antidepressant DTC ad will illuminate DTCA's potential contribution to consumer education and public health.

More specifically, a number of factors were considered to select the antidepressant DTCA category among various therapeutic categories. First, among the top 20 most advertised prescription drugs, mental depression is one of highly stigmatized conditions (An & Kang, 2011; Donohue, Cevasco, Rosenthal, 2007; Park & Grow, 2008). In this regard, understanding the educational value of antidepressant DTCA may provide insight into reducing social stigma associated with the disease category (An & Kang 2011). Second, mental depression is the most common form of mood disorders that deserve research attention (Park & Grow, 2008). Third, mental depression remains as a largely under-diagnosed and under-treated illness category (Holmer, 2002), which calls for consumer education to promote disease diagnosis and treatment. DTCA has been considered one potential health education source (Royne & Myers, 2008). Although approximately 10% of US adults reported their current depression during 2007-2010, recent national data suggest that only 8.7% of Americans have used an antidepressant in the past

month during the same period (National Center for Health Statistics, 2013; Health, United States, 2012). More specifically, in terms of gender, 5.3% of male respondents reported that they have used antidepressants, while 11.9% have used antidepressants in past 30 days (CDC, National Center for Health Statistics. Health, United States, 2012). This suggests that male consumers still need appropriate medical treatments along with other life style remedies. Fourth, antidepressant DTCA is targeted at a potentially vulnerable consumers with symptoms such as feeling of social isolation and worthlessness (Park & Grow, 2008). Addressing this category has important social implications. Fifth, antidepressant treatments contribute to reduced risk of suicide (Olfson, Shaffer, Marcus, & Greenberg, 2003) and lower suicide rates (Gibbons, Hur, Bhaumik, & Mann, 2006). Sixth, depressive disorders often harm social, occupational, and role functions and thereby have detrimental consequences on quality of life (Olfson et al., 2002). Olfson et al., (2002) notes that the negative effects of depression on daily function of individuals match that of heart disease, and exceed that of diabetes, arthritis, and peptic ulcer disease. Seventh, according to the Global Burden of Disease Study (Murray & Lopez, 1996), major depression is the fourth leading cause of worldwide disability and is speculated to become the second leading cause by 2020. Eighth, among persons diagnosed with and receiving treatment for depression, the second highly used treatment method was antidepressant (75.3%) followed by physician visits (84.6%) (Marcus & Olfson, 2010). Considering that antidepressant DTCA spending is positively associated with antidepressant uses (Donohue & Burndt, 2004), addressing consumer response to antidepressant DTC ads will add invaluable insights into promoting depression diagnosis and the treatment-expanding role of DTCA (Park & Grow, 2008).

Given the importance of antidepressant DTCA, the prominence of risk disclosure was

manipulated through combining various message execution factors simultaneously based on the FDA's (2009) draft guidance for pharmaceutical marketers' risk communication. To be more specific, high risk disclosure prominence was operationalized as a combination of using box outlines (vs. running text without box lines), a larger font size (14 vs. 10), red colored texts (vs. black), bold type (vs. regular), bulleted texts (vs. no bullets), and proximate placement to use information. In contrast, to operationalize the low prominence condition, the above message devices were employed in opposite ways (see appendix B & C). As a result, except major health risks of the drug (i.e., manipulation), all other design elements were equivalent across different experimental conditions. Graphics were exactly the same and word counts were largely equivalent across the two conditions (i.e., 221 for low prominence; 227 for high prominence).

To secure proper manipulation, two pretests were conducted. In the first pretest, 58 college students from a northern state university participated. In the second pretest, 59 college students from different state universities participated. To check whether risk disclosure prominence was successfully manipulated, subjects were asked to indicate on a 7-point scale (1 = not at all prominent, 7 = extremely prominent) their agreement with "How prominent do you feel was the information in the ad about the health risks of Luminexell?"

In the first pretest, the manipulation check results and respondents' solicited focus group interview were analyzed (Griffin, Babin, & Darden, 1992). The customized *simple* method contrast test results for the first pretest indicated that the manipulation of risk disclosure prominence was not successful, $M_{\text{low-prominence}} = 3.61$, $SD = 1.41$, $M_{\text{high-prominence}} = 3.81$, $SD = 1.47$, difference value (estimate – hypothesized) = -.31, $SE = .38$, $p > .05$. The results were discussed with an experienced advertising professor to modify the manipulation to be more appropriate,

and then the researcher determined to conduct the second pretest after revising the stimuli and manipulation check items.

In the second pretest phase, two ad stimuli were generated by using professional visual design softwares, including Adobe Creative Cloud Indesign and Photoshop. Subjects were shown the ads and reported their impression about prominence of risk disclosure in the ads. A *simple* method planned contrast test was performed, using the statement "How prominent do you feel was the information in the ad about the health risks of Luminexell?" with endpoints of "not at all prominent" and "extremely prominent." The results showed that the manipulation of risk disclosure prominence was successful, ($M_{\text{low-prominence}}$ = 3.27, *SD* = 1.49, $M_{\text{high-prominence}}$ = 4.21, *SD* = 1.75, difference value (estimate – hypothesized) = -.94, *SE* = .44, $p < .05$.

Based on the pretest results, in the main test the manipulation check was also conducted, in order to confirm the test ads were operationalized as the researcher intended. The GLM univariate test results showed that the manipulation of risk disclosure prominence was successful, $M_{\text{low-prominence}}$ = 4.41, *SD* = 1.60, $M_{\text{high-prominence}}$ = 5.03, *SD* = 1.52, $F(1, 262) = 10.43$, $p \leq .001$. The customized contrast test using the *simple* method confirmed that the manipulation was successful as the researcher intended, with the difference value (estimate – hypothesized) = -.62, *SE* = .19, $p \leq .001$. Taken together, these results clearly indicate the success of manipulation in that the comparisons between high and low prominence conditions revealed statistically significant perceptual difference regarding risk disclosure prominence.

It is worth noting that the procedure of conducting the instrument of this study, including the positioning of each measure of constructs in the questionnaire, was carefully designed based on the consumer research and marketing literature (e.g., Aronson & Carlsmith, 1968; Keppel.,

1982; Keppel & Wickens, 2004; Purdue & Summers, 1986; Shadish, Cook, & Campbell, 2002). First, random assignment of subjects to study treatment conditions facilitates causal interpretation by excluding potential systematic extraneous factors (Keppel & Wickens, 2004; Shadish et al., 2002). In particular, manipulation and confounding checks appear to have critical value during the pretest/pilot test, because the cost associated with negative results at this phase is relatively small, whereas the cost associated with unfavorable results is high in the main experimental stage (Perdue & Summers, 1986).

Among others, the timing of manipulation and confounding checks is worthy to note (i.e., before or after dependent measures). In general, extensive testing of the manipulations in the pretest phase could lessen the need for manipulation and confounding checks in the main experiment if this testing is conducted with the same procedures, experimental instruments, and subject types as the main experiment (Purdue & Summers, 1986). In this regard, the current research employed almost the same procedure, experimental instruments, and subject types to reduce variations between the pretests and main experiment. Further, the current research followed a widely suggested experimental procedure that runs the major experiment only after the manipulation checks are found to be successful in the pre-test phase. Nevertheless, to secure the success of manipulation in the main test, manipulation and confounding checks were also included in the main experiment (Kerlinger & Lee, 2000; Shadish et al., 2002).

The reason of including such checks before dependent measures in the main experiment was because the researcher judged that ensuring appropriate operationalization of the independent variable (i.e., prominence) is critical given the FDA's concern about risk disclosure prominence. Further, potential correlates of criterion variables identified and adopted from the

health communication literature were measured before stimuli, because those constructs are individuals' pre-existing cognitive traits that need to be treated as persistent characteristics rather than immediate responses to the experimental stimuli. Therefore, according to the consumer experimental convention in the literature, the current research performed the measurement of potential correlates before subjects were shown experimental test ads.

In addition, the inclusion of manipulation and confounding checks before dependent measures can be justified based on the literature on experimental methodology. Specifically, research suggests that subjects should be interviewed to complete manipulation and confounding checks immediately after exposure to the manipulation (Aronson & Carlsmith, 1968; Purdue & Summers, 1986). Waiting until after the dependent variables have been assessed is likely to decrease the subject's capacity to fully indicate their responses to the manipulation and could bias their reports (Purdue & Summers, 1986). Moreover, the researcher conducted solicited interviews with pretest participants as supplemental qualitative techniques (Aronson & Carlsmith, 1968). These methods can offer a better perspective of how the desired variance in the intended independent variable can be operated (Purdue & Summers, 1986).

With regard to manipulation checks in the main experiment, although some suggest that dependent measures should be conducted first due to demand characteristics associated with self-reports or other forms of obtrusive measurement (Wetzel, 1977), measuring the dependent variables before conducting the manipulation assessment presents a set of potential problems. First, when the manipulation checks come after the dependent measures, important effects of the manipulation could already have dissipated because the manipulation effects would be temporary in the level of the independent or any confounding variable (Purdue & Summers, 1986). In

particular, when these checks involve self-report measures, subjects' responses to the dependent measures could bias their reactions to the subsequent manipulation checks (Kidd, 1976).

In this study, the manipulation check results appeared to be significant, $M_{\text{low-prominence}} = 4.41$, $SD = 1.60$, $M_{\text{high-prominence}} = 5.03$, $SD = 1.51$, $F(1, 262) = 10.43$, $p \leq .001$, whereas the confounding check did not show significant results, $M_{\text{low-prominence}} = 5.16$, $SD = 1.17$, $M_{\text{high-prominence}} = 4.98$, $SD = 1.45$, $F(1, 262) = 11.26$, $p > .10$, using the statement "How prominent do you feel was the information in the ad about the uses of Luminexell?" with endpoints of "not at all prominent" and "extremely prominent." Although use of confounding checks has been rarely employed in marketing experiments despite its importance (Purdue & Summers, 1986), the current research utilized the confounding check and further demonstrated that the manipulation was successful with less concern about potential confounding.

To address alternative insights for the ordering of manipulation checks and dependent measures, Kidd (1976) suggests the creation of manipulation check groups whose sole purpose is the assessment of manipulation success. However, Wetzel (1977) argues that the subjects in a pretest serve the function of Kidd's (1976) manipulation check groups. In this study, a series of pretests ensuring the equivalence between the pretests and the main experiment clearly support the manipulation of prominence was successful, and the pattern of prominence effects on major dependent variables were similar, indicating that the potential problem of the ordering effects of manipulation checks before dependent variables are less plausible.

Measurements

Measured Independent Variable: DTCA Regulatory Knowledge

DTCA regulatory knowledge was measured using multiple items adopted from the FDA's consumer education webpage regarding prescription drug advertising, *For Consumers & Patients* (FDA, 2014). The FDA provides health information on its website for consumers to stay safe and healthy. On the website, consumers can obtain information by topic such as cosmetics, drugs, food, medical devices, and tobacco products. If consumers click on the drugs menu, they are linked to various information sources regarding the use of drug such as educational resources, buying & using medicine safely, tips for seniors, tips for parents, and prescription drug advertising.

Consumers can navigate detailed information through clicking on the prescription drug advertising menu from the left side navigation column. The linked page shows important and relevant information regarding prescription drug advertising, including the background of drug advertising, basics of drug ads, questions to ask yourself, and sample prescription drug advertisements, in order to promote general knowledge of the DTCA category. Among others, the page provides consumers with *frequent questions and answers* (Q&A) regarding prescription drug advertising to inform consumers about the DTCA category's regulatory context. The current research borrows the DTCA knowledge measure items from the Q&A section, because it best represents the current FDA's thought and consumers' most frequent questions regarding the DTCA category.

Individuals' DTCA regulatory knowledge has been neither measured nor controlled in the literature. Therefore, developing the measurement of this construct was critical for this

research. The measurement of knowledge has long been a subject in the marketing literature (e.g., House et al., 2004; Park et al., 1994). The current research adopted a widely suggested approach to measure DTCA regulatory knowledge. The objective measure of DTCA regulatory knowledge was designed as series of six true/false items. According to previous research approach (Park et al., 1994), the items were selected from the FDA's consumer education page through discussions with DTCA experts and from modifications of the pretest items.

More specifically, to establish the validity of the measurement, the items were reviewed by professional DTCA researchers, and selected and refined to form a better measurement scale for the intended construct. The measure items included: (1) The FDA bans consumer-directed ads for prescription drugs that have serious health risks; (2) The FDA requires drug companies to use hard-to-understand medial language in prescription drug ads directed to consumers; (3) The FDA works with drug companies to create prescription drug ads directed to consumers; (4) The FDA approves prescription drug ads before they are seen by the public; (5) The FDA regulates the design of prescription drug ads directed to consumers; and (6) The FDA conducts research to examine consumer attitudes and behaviors toward prescription drug advertising (see Table 3 & 4). The mean for DTCA regulatory knowledge was 2.09 (SD = 1.29), indicating an overall low knowledge level. A one sample t-test results shows that the average DTCA regulatory knowledge is significantly lower than the mid-point (3.5), $t(263) = -17.79$, $p < .001$.

Table 3. Percentage of Right Answers for DTCA Regulatory Knowledge

Items	The FDA bans consumer-directed ads for prescription drugs that have serious health risks	The FDA requires drug companies to use hard-to-understand medial language in prescription drug ads directed to consumers	The FDA works with drug companies to create prescription drug ads directed to consumers	The FDA approves prescription drug ads before they are seen by the public	The FDA regulates the design of prescription drug ads directed to consumers	The FDA conducts research to examine consumer attitudes and behaviors toward prescription drug advertising
Percentage of Right Answers	38.6%	62.1%	27.7%	20.8%	29.5%	30.3%

Table 4. Descriptives for DTCA Regulatory Knowledge

Number of Right Answers	*N*	%
0	34	12.9
1	47	17.8
2	96	36.4
3	41	15.5
4	40	15.2
5	6	2.3
6	0	0
Total	264	100

Dependent Variable: Perceived Attention to Risk Disclosure

The measurement of attention poses a major challenge to consumer researchers. Three general approaches are found to have been employed in the consumer psychology literature: inferences based on observed behaviors, psycho-physiological techniques, and self-reports (Chaffee & Schleuder, 1986). To provide a foundation for the use of perceived attention to risk disclosure in this research, in this section prior research is reviewed with the justification of the measurement approach of current research.

First, the behavioral observation approach has assessed the movements of people who were filmed while watching stimuli by carefully coding facial expressions (Ekman et al., 1972), by observing participants' eye gaze or aversion during experimental presentations of messages (Alwitt, Anderson, Lorch, & Levin, 1980), and by measuring reaction times to a message (Meadowcroft & Reeves, 1985).

Second, in terms of the psycho-physiological measurement, experimental psychology and psychophysiology have examined blood pressure, galvanic skin response (Zillmann, 1982) and brain wave activity (Thorson, Reeves, & Schleuder, 1985). In particular, eye-tracking methodology has been one of the most popular approaches to measure attention. Because attention to advertisements cannot be directly inferred from consumers' memory, it is useful to examine consumers' actual eye (e.g., pupil) movements. Specifically, cameras track the eye and head position, and allow for continuous correction of position shifts. A couple of indicators of visual attention can be assessed including ad (i.e., entire ad page) gaze duration and ad-element gaze duration (Krugman et al., 1994; Pieters, 2008). Ad gaze duration is the total time that consumers who selected the ad, on average, spent on it, and measures how well an ad retains consumers in its environment. Ad-element gaze duration assesses the time spent on each of the ad elements (Pieters & Wedel, 2004). Eye-tracking methodologies may be promising because gaze can be used as a proxy measure for a consumer's attention (Cutrell & Guan, 2007). While many measurement approaches of attention rely on the explicit actions of consumers such as mouse clicks, query streams or diary reports, eye tracking can provide more detailed moment-by-moment observations about how consumers interact with messages (Cutrell & Guan, 2007).

Third, with regard to self-reports, a consumer is asked to recall prior mental states

regarding attention perception. This methodological approach is employed not because it is an ideal method, but because for many research purposes it is the only measure available (Chaffee & Schleuder, 1986). In experimental effects research, correlations between objective attention and self-reported attention measures have been employed as a validity check (e.g., Krull & Husson, 1979; Reeves et al., 1985) and introspective self-observation is commonly utilized in survey research (Chaffee & Schleuder, 1986).

The above three general approaches to attention measurement have their own advantages and disadvantages. Although behavioral observation provides an indicator for natural attention setting, one cannot assume that its effects can be tested in the same way as with more closely attended messages. Although psychophysiological approaches offer more reliable and accurate measures for attention, more often than not, the resources and instruments are not available for researchers. Further, these approaches have limitations in providing an immediate solution to multivariate filed research where attention to various media is to be measured. (see Chaffee & Schleuder, 1986 for more information).

Given the foregoing review of literature on attention measurement, there are various ways to conceptualize and measure attention to messages. However, all these approaches are viewed as legitimate and valuable and methodologically the simplest way to operationalize attention is self-reports (Reeves & Thorson, 1986; Thorson et al., 1992). For this reason and given limited resources, the self-reported intensity of attention (i.e., perceived attention) is employed in the current research.

To assess the extent of subjects' perceived attention to risk disclosure prominence, a single-item 7-point Likert-type scale was adopted from prior research (Thorson et al., 1992) and

modified for the current study context: "How much attention did you pay to the information about the health risks of Luminexell?" (1 = no attention, 7 = great attention). The mean for perceived attention was 5.78 (*SD* = 1.29) (see Table 5). Overall, subjects reported relatively high perceived attention. 39% (n = 103) of the sample reported "great attention." This high number raises caution in interpreting the results. For instance, due to the artificial nature of experiment or obtrusive self-reported measure, the overall attention score could have been inflated. The overall frequency distribution of perceived attention was negatively skewed (skewness = -.84, *SE* = .15), indicating lack of symmetry. In addition, subjects' reported average attention score was higher than the midpoint (4), using a one-sample t-test, $t(263) = 22.42$, $p < .001$.

Dependent Variables: Recall and Recognition

Advertising research has employed recall and recognition as important effectiveness measures (Moore, Stammerjohan, & Coulter, 2005). In particular, considering that the major purpose of risk disclosure is to encourage consumers to utilize provided risk information in their decision making (Andres et al., 2009; Burton, Andrews, & Netemeyer, 2000), examining recall and recognition of risk information in DTCA may provide meaningful insight into consumer health education. In addition, research on advertising attention has measured recall and recognition as major criterion variables (Rosbergen et al., 1997).

In general, the most widely employed two memory measures in advertising research are unaided-recall that is an open-ended question, and aided-recognition measure that provides a list of choices to allow respondents to indicate whether each choice was presented in the ad (Rosbergen et al., 1997). In this research, the recall test was an open-ended question asking subjects to write all health risks that were presented in the ad as much as they can recall. The

recall test statement read “The ad presented the health risks of Luminexell. In the box below, please write all the health risks of Luminexell you can recall from the ad. (Lynch & Srull, 1982)” To appraise recognition, subjects were provided with a checklist that presents a list of ten health risks. Five of which were the health risks of the drug presented in the ad, and the remaining five of which were "distracter" (false) health risks that were not presented in the ad (Davis, 2010; Lynch & Srull, 1982). The order of health risks were randomized using the Qualtrics software feature. The number of explicitly right answers for the recall test was coded by the researcher. In the same vein, the number of right answers for the recognition test was coded. For both measures, one right answer counted one point and the points were summed to form a composite score for each memory construct.

Table 5. Descriptives for Perceived Attention

Attention Levels	*N*	%
1	0	0
2	4	1.5
3	9	3.4
4	41	15.5
5	37	14.0
6	70	26.5
7	103	39.0
Total	264	100

It is worth noting that the current research especially uses a recognition task to assess explicit memory retrieval because recall performance is generally reported as low (Shapiro & Krishnan, 2001). To maximize the measurement validity, two methods were utilized. First, ten health risks were randomly shown to counterbalance potential order effects. Second, the

researcher considered whether the subject accurately or randomly chose the answer. To do so, when the subject indicated “yes” for the presented health risk, the researcher gave one point. Furthermore, to prevent inaccurate and biased random choice, when the subject indicated “no” for the health risk that was not presented (i.e., distractor), the subject was also given one point. However, when subjects failed to accurately recognize whether a particular health risk was shown in the ad, they did not obtain points. When the subject chose “don’t know” or a wrong answer, the answer was given 0. As a result, when the subject correctly answered for all choices, his/her score could add up to 10, whereas when the subject’s all answers were wrong or ambiguous (i.e., don’t know), the score could be 0. The summed single composite score for recognition measure was reliable (Cronbach’s $\alpha = .79$). The mean for the recognition score was 5.64 ($SD = 2.88$), indicating an overall high performance. 5.3% ($n = 14$) scored 0, whereas 10.2% ($n = 27$) scored 10 (see Table 6).

On the other hand, the recall score was coded by the researcher. When the subject reported explicitly correct health risk names that were presented in the ad, each correct answer was given one point. Therefore, when the subject correctly answered for all the five health risks presented in the ad, his/her score could add up to 5, whereas when he/she provided no right answers at all, his/her score could be 0. The mean for the recall score was 1.07 ($SD = 1.16$), indicating an overall low retrieval performance. Approximately 40% ($n = 105$) of the sample scored 0 (see Table 7). Whereas the recognition score was appropriate for calculating measurement reliability (internal consistency), the recall score was not appropriate for calculating a coefficient value. Further, given that only explicitly correct answers were coded as right answers, it was not necessary to conduct an inter-coder reliability test for the recall test.

Table 6. Descriptives for Recognition

Number of Right Answers	*N*	%
0	14	5.3
1	6	2.3
2	19	7.2
3	34	12.9
4	21	8.0
5	36	13.6
6	28	10.6
7	20	7.6
8	30	11.4
9	29	11.0
10	27	10.2
Total	264	100

Table 7. Descrptives for Recall

Number of Right Answers	*N*	%
0	105	39.8
1	73	27.7
2	53	20.1
3	28	10.6
4	3	1.1
5	2	.8
Total	264	100

Covariates

Several potential covariates of consumer response to DTCA were identified from the DTCA literature and measured to be controlled and to exclude alternative explanations of the findings. According to DTCA research and the health communication literature in general, various

pre-existing cognitive traits could affect consumer response to DTCA (e.g., An, Jin, & Brown, 2009, Park et al., 2013; Ju & Park, 2013), including current health status, subjective familiarity and perceived importance of a disease, and personal experience with a disease. Such cognitive variables are known to increase or decrease personal involvement with health product advertising information (An et al., 2009; Park et al., 2013). Therefore, the current research attempted to account for the influences of such variables. Specifically, subjects indicated on a four-point scale (1 = *poor*, 2 = *fair*, 3 = *good*, and 4 = *excellent*) how they rated their overall health at the present time ($M = 2.69$, $SD = .74$) (An et al., 2009; Park et al., 2013; Ju & Park, 2013). Perceived familiarity with depression was measured on a seven-point scale (1 = *not at all familiar*, 7 = *very familiar*; $M = 4.62$, $SD = 1.72$) (Ju & Park, 2013). According to a DeLorme, Huh, and Reid's (2009) analytical approach, to test whether or not this mean score was significantly different from the mid-point, a one sample t-test was conducted with the mid-point (4) as a test value. The results indicated significant difference ($t = 5.83$, $df = 263$, $p < .001$). Perceived importance given to depression was assessed on a seven-point scale (1 = *not at all important*, 7 = *very important*; $M = 4.81$, $SD = 1.78$) (Laffrey & Isenberg, 1983; Ju & Park, 2013). To test whether or not this mean score was significantly different from the median point, a one sample t-test was conducted with the mid-point (4) as a test value. The results indicated significant difference ($t = 7.43$, $df = 263$, $p < .001$). Prior experience with depression was measured using yes/no response options (An et al., 2009; Park & Grow, 2008; Park et al., 2013; Ju & Park, 2013). About 30% of subjects reported having been diagnosed with depression. These potential covariates were submitted to regression analyses for their potential influence on dependent variables to be controlled (Hair, Anderson, Tathan, & Black, 1998). In addition, to ensure how much subjects are knowledgeable about mental depression in

general, their subjective (perceived) knowledge about clinical depression was measured ($M = 4.32$, $SD = 1.67$). A one sample t-test was conducted with the mid-point (4) as a test value. The results indicated significant difference ($t = 3.13$, $df = 263$, $p < .01$). The results from a series of t-tests imply that subjects of the current research have a reasonably good understanding of what clinical depression is (see Appendix A for more information regarding measure items).

CHAPTER 4: ANALYSIS AND RESULTS

Analysis Approach

To analyze the data, descriptive and inferential statistics were utilized. In terms of descriptive statistics, correlations among the major study variables are summarized along with means and standard deviations in Table 8. To test the main and interaction effect hypotheses, the current research employs a series of multiple regressions. In particular, because DTCA regulatory knowledge was measured using a quantitative composite score, regression analysis helps the researcher prevent from unnecessary loss of information and statistical power due to dichotomizing the knowledge level into a few categorical groups (Fitzsimons, 2008). In addition, to further pinpoint the patterns of interaction between DTCA regulatory knowledge and prominence on dependent variables, regression slopes and intercepts for each subgroup (high prominence vs. low prominence) were interpreted. Specifically, the *Johnson-Neyman's significance region* procedure and simple slop analysis were performed to see where the significant prominence effects exist among varying levels of DTCA knowledge. As to the mediation tests, this research employs the *bootstrap* approach because the method is suggested as a superior approach to the traditional Baron and Kenny method (Preacher & Hayes, 2004, 2008; Zhao, Lynch Jr., & Chen, 2010).

Table 8. Inter-Correlations among Major Variables of Study

	Major Variables	Prominence	DTCA Knowledge	Perceived Attention	Recall	Recognition
1.	Prominence	1				
2.	DTCA Knowledge	-.006	1			
3.	Perceived Attention	.186**	.207**	1		
4.	Recall	.167**	.027	.267**	1	
5.	Recognition	.220**	.083	.379**	.437**	1

Note: ** Significant at .01

The Results of Hypothesis Tests

Hypotheses 1 through 6: Prominence and DTCA Knowledge Main Effects

To examine the hypotheses 1-6, moderated hierarchical analyses were used. As a check for multicollinearity, the researcher calculated variance inflation factor (VIF) scores for all variables in each regression model. As shown in Table 9, 10, and 11, all VIF scores were less than 2, suggesting that muticollinearity was not a serious problem in the analysis (Oke, Walumbwa, & Meyers, 2012). To control potential correlates, gender, age, education, and household income were entered as general demographic control variables at Step 1. Then, the correlates of consumer response to the DTC ad identified in the literature were submitted at Step 2, including overall health status, perceived familiarity, perceived importance, and prior experience. At Step 3, prominence and DTCA regulatory knowledge were entered. Finally, the prominence × DTCA regulatory knowledge interaction was entered at Step 4. List-wise deletions accounted for missing values.

Table 9 summarizes the results of the regression on the extent of perceived attention. The results showed that risk disclosure prominence had significant effects on perceived attention (b = .589, SE = .186, $p < .01$, supporting H1. In addition, DTCA regulatory knowledge had significant

effects on perceived attention (b = .281, SE = .072, p < .001), supporting H4.

The same procedure was used to examine the prominence main effects on recall. To control potential correlates, gender, age, education, and household income were entered as general demographic control variables at Step 1. Then, the correlates of consumer response to the DTC ad identified in the literature were submitted at Step 2, including overall health status, perceived familiarity, perceived importance, prior experience. At Step 3, prominence and DTCA regulatory knowledge were entered. Finally, the prominence × DTCA regulatory knowledge interaction was entered at Step 4. List-wise deletions accounted for missing values.

Table 9. Moderated Hierarchical Regression on Perceived Attention (N = 264)

Predictors		*Statistics*			
		b (SE)	*Block* ΔR^2	*Block* ΔF	*Variance Inflation Factor (VIF)*
Step 1			.007	.450	
	Gender	-.021 (.165)			1.14
	Age	.004 (.006)			1.12
	Education	-.054 (.048)			1.28
	Annual household income	.064 (.065)			1.36
Step 2			.076	5.308***	
	Overall health	.020 (.110)			1.18
	Perceived familiarity	.087 (.063)			2.09
	Perceived importance	.116 (.059)			2.01
	Personal experience	-.071 (.196)			1.45
Step 3			.053	7.833**	
	Risk disclosure prominence	.589 (.186)**			1.56
	DTCA regulatory knowledge	.281(.072)***			1.56
Step 4			.016	4.896*	
	Prominence × DTCA knowledge	-.606 (.274)*			1.91

Note. Adjusted R^2 = .116, *p < .05, **p < .01, ***p < .001

Table 10 summarizes the results of the regression on the extent of risk information recall. The results showed that risk disclosure prominence did not have significant effects on risk

disclosure recall (b = .161, SE = .166, p > .05. The results did not support H2. In the same vein, DTCA knowledge did not have significant effects on risk disclosure recall (b = -.011, SE = .064, p > .05). H5 was not supported.

Table 10. Moderated Hierarchical Regression on Recall (N = 264)

	Statistics			
Predictors	*b (SE)*	*Block* ΔR^2	*Block* ΔF	*Variance Inflation Factor (VIF)*
Step 1		.064	4.463**	
Gender	.241 (.147)			1.14
Age	-.009 (.005)			1.12
Education	.041 (.043)			1.28
Annual household income	.103 (.058)			136
Step 2		.032	2.246	
Overall health	-.102 (.098)			1.18
Perceived familiarity	.024 (.056)			2.09
Perceived importance	.028 (.053)			2.01
Personal experience	.215 (.174)			1.15
Step 3		.009	1.203	
Risk disclosure prominence	.161 (.166)			1.56
DTCA regulatory knowledge	-.011(.064)			1.56
Step 4		.002	.461	
Prominence × DTCA knowledge	.166 (.244)			1.91

Note. Adjusted R^2 = .067, **p < .01

The same procedure was used to examine the prominence main effects on recognition. To control potential correlates, gender, age, education, and household income were entered as general demographic control variables at Step 1. Then, the correlates of consumer response to the DTC ad identified in the literature were submitted at Step 2, including overall health status, perceived familiarity, perceived importance, prior experience. At Step 3, prominence and DTCA regulatory knowledge were entered. Finally, the prominence × DTCA regulatory knowledge interaction was entered at Step 4. List-wise deletions accounted for missing values.

Table 11 summarizes the results of the regression on the extent of risk information

recognition. The results showed that risk disclosure prominence had significant effects on risk disclosure recognition (b = 1.374, SE = .432, $p < .01$, supporting H3. In the same token, DTCA regulatory knowledge had significant effects on risk disclosure recognition, supporting H6.

Table 11. Moderated Hierarchical Regression on Recognition (N = 264)

		Statistics		
Predictors	*b (SE)*	*Block* ΔR^2	*Block* ΔF	*Variance Inflation Factor (VIF)*
Step 1		.011	.726	
Gender	.089 (.384)			1.14
Age	-.008 (.013)			1.12
Education	-.006 (.111)			1.28
Annual household income	.047 (.151)			1.36
Step 2		.033	2.206	
Overall health	-.326 (.256)			1.18
Perceived familiarity	-.052 (.146)			2.09
Perceived importance	.114 (.138)			2.01
Personal experience	.561 (.454)			1.15
Step 3		.036	4.961**	
Risk disclosure prominence	1.374 (.432)**			1.56
DTCA regualtory knowledge	.338 (.168)*			1.56
Step 4		.008	2.235	
Prominence × DTCA knowledge	-.951 (.636)			1.91

Note. Adjusted R^2 = .067, **$p < .01$

Hypotheses 7a, 7b, and 7c: Moderating Effects of DTCA Regulatory Knowledge

As shown, in the previous sections, moderated hierarchical regressions on perceived attention (see Table 4), recall (see Table 5) and recognition (see Table 6) were performed. Among the three criterion variables, DTCA regulatory knowledge was found to positively moderate the effects of risk disclosure prominence on perceived attention. The block including the prominence × DTCA regulatory knowledge was associated with a significant increase in explained variance in perceived attention (ΔR^2 = .016, $p < .05$), supporting H7a. However, the interaction was not significant on recall and recognition and therefore H7b and H7c were not

supported.

Specifically, according to Aiken and West (1991), to assess possible prominence differences in both the intercept and slope for prediction of the extent of perceived attention, the moderated hierarchical regression was performed to predict perceived attention from prominence (dummy coded 1 = high, 0 = low), DTCA regulatory knowledge, and a product term to represent a prominence-by-DTCA regulatory knowledge interaction. The overall regression was statistically significant, and explained a fair proportion of the variance in perceived attention, R = .391, adjusted R^2 = .116, F (11, 252) = 4.143, p < .001. Further, the interaction between prominence and DTCA knowledge was statistically significant, with b = -.606, t (252) = -2.213, p < .05. The regression equations to predict perceived attention from DTCA regulatory knowledge were as follows:

High prominence subgroup: 5.83 + .09 × DTCA Regulatory Knowledge
Low prominence subgroup: 4.85 + .33 × DTCA Regulatory Knowledge

These two regressions are graphed in Figure 2. High and low prominence risk disclosures did not considerably differ among high DTCA regulatory knowledge consumers, whereas among low DTCA regulatory knowledge consumers' perceived attention was considerably higher in response to high prominence risk disclosure. In addition, the predicted perceived attention increase for low prominence (.33) was higher than the predicted perceived attention increase for high prominence (.09). This shows that as knowledge increases, the difference in the level of attention between low knowledge and high knowledge groups will decrease. The predicted perceived attention increase per DTCA regulatory knowledge was 0.24 higher for low prominence individuals than for high prominence individuals.

A simple slopes analysis confirms this pattern. When knowledge was low (corresponding to one standard deviation lower than the mean), and medium (corresponding to the mean), the high prominence condition led to a higher level of attention ($p < .05$), whereas it did not when knowledge was high ($p > .05$). Application of the *Johnson-Neyman* technique shows that the difference between high and low prominence conditions would be significant when DTCA knowledge was 2.50 or lower on the five-point scale. These patterns of slopes and intercepts support the hypothesized main effects of prominence and moderating role of DTCA knowledge on perceived attention to risk disclosure (Aiken & West, 1991). Therefore, H7a was supported. The main and moderating effect hypotheses are summarized in Table 12.

Hypotheses 8, 9, and 10: Mediating Effects of Perceived Attention

Hypotheses 8, 9, and 10 suggested that perceived attention would mediate the effects of prominence, DTCA knowledge, and their interaction on consumer memory of risk information, including recall and recognition. In particular, H10 represents a *mediated moderation relationship*. A mediated moderation refers to the extent to which an intervening variable mediates the effect of a more distal independent variable at different levels of the moderator (Baron & Kenny, 1986).

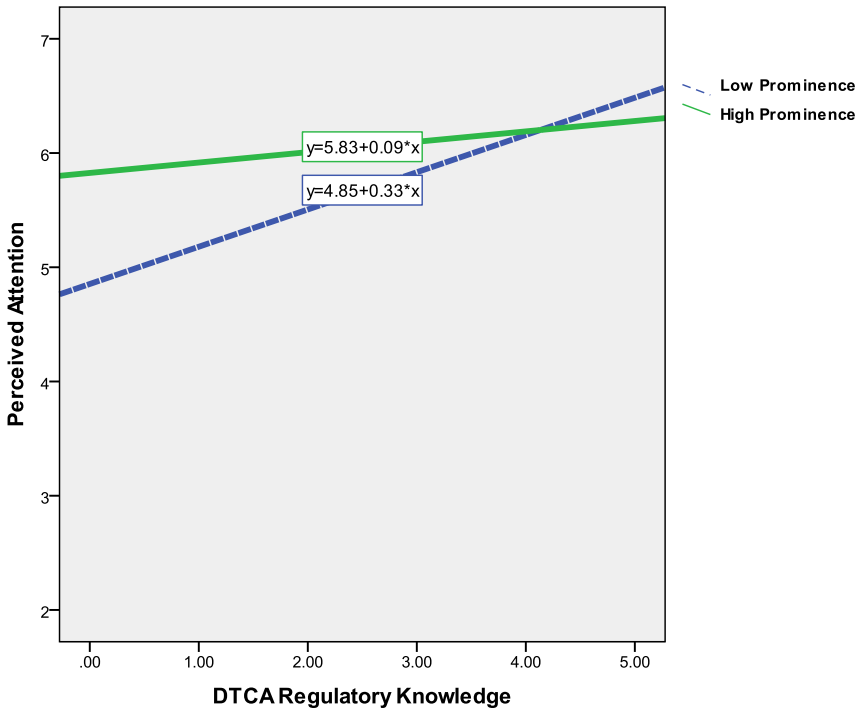

Figure 2. Prominence × DTCA Regulatory Knowledge on Perceived Attention

To examine the hypothesized mediations, the researcher adopted the *bootstrap approach* outlined by Preacher and Hayes (2004). The bootstrapping method is similar to the Sobel (1982) test, but is suggested as a superior alternative if raw data are available (Homburg, Wieseke, & Bornemann, 2009). Further, Zhao, Lynch, and Chen (2010) note that in testing the significance of an indirect effect between predictors and criterion variables, the bootstrap approach is more rigorous and powerful than Sobel. The researcher estimated the *indirect effects* of the predictors through the mediator variable on the dependent variables and repeated the sampling 5000 times (Zhao et al., 2010). To secure consistency between the main effect and mediation tests, the same control variables were entered in the bootstrap macro.

Table 12. Summary of the Main and Moderating Effect Hypotheses

Hypotheses	Predictors	Outcomes	Results
H1	Prominence	Perceived Attention	**Supported**
H2	Prominence	Recall	Not supported
H3	Prominence	Recognition	**Supported**
H4	DTCA Knowledge	Perceived Attention	**Supported**
H5	DTCA Knowledge	Recall	Not supported
H6	DTCA Knowledge	Recognition	**Supported**
H7a	Prominence × DTCA Knowledge	Perceived Attention	**Supported**
H7b	Prominence × DTCA Knowledge	Recall	Not supported
H7c	Prominence × DTCA Knowledge	Recognition	Not supported

According to the suggested steps by Zhao et al. (2010) for mediation analysis, the mediating role of perceived attention was denoted as (a × b) and the direct effects of independent variables on dependent variables were denoted as (c) with a 95% confidence interval (CI), along with 5000 bootstrap samples.

First, to examine the mediating role of perceived attention between prominence and recall, variables were submitted to the Preacher-Hayes (2008) bootstrap macro in SPSS 21. In the first analysis, the IV was prominence and the mediating variable (M) was perceived attention. The DV was recall score. The results showed that perceived attention had *indirect-only* mediation effects (a × b = .08) between prominence and recall, with a 95% CI excluding zero (.0144 to .1704). The direct effect c (.14) was not significant ($p > .05$). This indirect-only mediation overlaps with Baron and Kenny's (1986) *full mediation* (Zhao et al., 2010). The results support H8a.

The same procedure was performed on recognition. The results showed that perceived

attention had *complementary mediation* effects (a × b = .31) between prominence and recognition, with a 95% CI excluding zero (.0483 to .6374). The direct effect c (.75) was significant ($p < .05$). Specifically, a × b × c (.23) was positive, suggesting a *complementary mediation* (Zhao et al., 2010). The complementary mediation indicates that researchers need to consider the likelihood of an omitted mediator in the direct path, even though the hypothesized mediator was identified consistent with the researcher's theoretical framework. The complementary mediation overlaps with Baron and Kenny's partial mediation (Zaho et al., 2010). Further, complementary mediations have been referred to as "consistent" models or "positive confounding" (Shrout & Bogler, 2002), From the bootstrap perspective, the results of this study support H8b, while suggesting consideration of a possibly omitted mediator in the direct path between prominence and recognition.

To test H9a and H9b, the same approach was employed on recall and recognition. The independent variable was DTCA knowledge, perceived attention was a mediator, and recall and recognition were dependent variables. The results showed that perceived attention had *indirect-only* effects (a × b = .04) between DTCA knowledge and recall, with a 95% CI excluding zero (.0135 to .0786). The direct effect c (-.03) was not significant ($p > .05$). H9a was supported.

As to recognition, the results showed that perceived attention had *indirect-only* effects (a × b = .19) between DTCA knowledge and recognition, with a 95% CI excluding zero (.0545 to .2911). The direct effect c (.04) was not significant ($p > .05$). H9b was supported.

Finally, to test H10a and H10b, the interaction term of prominence and DTCA knowledge (IV) was entered in the bootstrap macro with perceived attention (M) and recall and recognition (DVs). The results showed that perceived attention had indirect effects (a × b = -

.13) between the interaction of prominence and DTCA regulatory knowledge, and recall, with a 95% CI excluding zero (-.2941 to -.0194). The direct effect c (.29) was not significant ($p > .05$). These results indicate that the interaction of prominence and DTCA regulatory knowledge had significant interaction effects through perceived attention on recall. To pinpoint the moderated mediation pattern, the *Johnson-Neyman method* was employed. The results showed that when DTCA regulatory knowledge was one standard deviation (SD) below the mean (.0409 to .2675) and was the mean (.0165 to .1630), perceived attention mediated the prominence effects on recall, with a 95% CI excluding zero. However, when DTCA regulatory knowledge was plus one SD from mean, the mediating effects of perceived attention was not significant, with a 95% CI including zero (-.0673 to .0989). These results supported H10a (moderated mediation).

The same procedure was performed on recognition. To test H10b, the interaction term of prominence and DTCA regulatory knowledge (IV) was entered in the bootstrap macro with perceived attention (M) and recognition (DV). The results showed that perceived attention had indirect effects ($a \times b = -.47$) between the interaction of prominence and DTCA regulatory knowledge, and recognition, with a 95% CI excluding zero (-.9906 to -.0759). The direct effect c (-.48) was not significant ($p > .05$). These results indicate that the interaction of prominence and DTCA regulatory knowledge had significant interaction effects through perceived attention on recognition. To pinpoint the moderated mediation pattern, the *Johnson-Neyman method* was employed. The results showed that when DTCA regulatory knowledge was one standard deviation (SD) below the mean (.1554 to 1.0272) and is the mean (.0554 to .6201), perceived attention mediated the prominence effects on recognition, with a 95% CI excluding zero. However, when DTCA regulatory knowledge was plus one SD from mean, the mediating effects

of perceived attention were not significant, with a 95% CI including zero (-.2712 to .3793). These results supported H10b (moderated mediation). The mediation test results are summarized in Table 13.

Table 13. Summary of the Bootstrap Mediation Test Results

Hypotheses	Predictors (IVs)	Mediators (M)	Outcomes (DVs)	Results
H8a	Prominence	Perceived Attention	Recall	**Supported**
H8b	Prominence	Perceived Attention	Recognition	**Supported**
H9a	DTCA Knowledge	Perceived Attention	Recall	**Supported**
H9b	DTCA Knowledge	Perceived Attention	Recognition	**Supported**
H10a	Prominence × DTCA Knowledge	Perceived Attention	Recall	**Supported**
H10b	Prominence × DTCA Knowledge	Perceived Attention	Recognition	**Supported**

CHAPTER 5: DISCUSSION

Summary of Major Findings

The current research addresses how consumers' DTCA regulatory knowledge and varying levels of risk disclosure prominence affect consumers' risk disclosure coping strategies directly. Further, this research examines how DTCA regulatory knowledge moderates the risk disclosure prominence effects on consumers' perceived attention to and memory of risk information. DTCA regulatory knowledge was found to affect how consumers process risk information from DTC ads. The findings illuminate the dynamic mechanisms of consumer risk disclosure processing, and thereby inform how *fair balance* can be understood from the consumer perspective. This research suggests that risk disclosure prominence may work differently depending on varying levels of consumer knowledge about the role of FDA for DTCA. This has an important consumer education and public health implications because consumes' informed health decisions can be affected by DTCA regulatory knowledge. This research reveals that simply focusing on risk disclosure provision in DTCA may fail to illuminate true risk communication effectiveness.

In addition, pharmaceutical marketers could benefit from the findings of the current research because understanding in which conditions the message prominence effects are enhanced or reduced provides important insight into the advertising segmenting and design. From the consumer education perspective, the current research findings imply that consumer marketplace knowledge should be an important consideration in their health decision making and therefore the FDA and pharmaceutical marketers may need to exert more efforts to promote consumers' marketplace literacy beyond simply providing important health risk information in

DTCA. In particular, consumers' capacity to recognize important health risk information was significantly improved when DTCA regulatory knowledge was high. When the DTCA regulatory knowledge level was low, more prominent risk disclosure was more effective.

As has been well-documented, risk disclosure availability is critical in consumers' health decision making (e.g., Kavadas et al., 2007; Mazis & Staeliln, 1982; Stewart & Martin, 2004). However, the DTCA literature has underexplored how varying levels of DTCA regulatory knowledge affect such decisions. Despite the severe controversy over DTCA for the last decades, a dearth of research on consumers' cognitive processing of risk disclosure in DTCA might have led to an incomplete view of the impact of DTCA on consumers. From the public health perspective, identifying a way of more effective risk disclosure provision has importance. On the pharmaceutical marketer's end, it could be possible through enhancing risk disclosure prominence. On the consumer's end, sound health decision making using DTCA can be improved through enhancing DTCA regulatory knowledge. Taken together, those involved in DTCA practice and consumer education can benefit from consumer-oriented information processing principles (Boush et al., 2009; Mazis & Staelin, 1982; Richard, 1990).

In seeking to advance our understanding of consumer information processing mechanism of risk disclosure, this research also attempts to investigate a mediating cognitive factor (i.e., perceived attention) between DTCA regulatory knowledge and memory as well as between prominence and memory. In doing so, this research shows that both consumer and message factors can contribute to enhanced consumer involvement in risk disclosure processing. By testing different levels of DTCA regulatory knowledge and risk disclosure prominence, this research suggests that those involved in educating consumers about marketplace and designing

DTCA risk disclosure need to take such consumer and message factors into account.

Overall, the findings of this research supports the theoretical premise that consumer responses to the ad are affected by varying levels of DTCA regulatory knowledge and risk disclosure prominence. Specifically, highly knowledgeable consumers were more likely to memorize important health risks from the DTC ad in general. On the other hand, prominent disclosure was more effective among less knowledgeable consumers, indicating that message effects could vary depending on consumers' individual differences in cognitive variables (e.g., Petty & Cacioppo, 1986; Petty & Cacioppo, & Shumann, 1983). Improved recall and recognition scores clearly show that high levels of consumer literacy about the FDA's regulatory role for DTCA play a role in consumers' health information coping strategies.

Before discussing the implications of the research findings in more detail, the major findings are summarized as follows: (1) higher DTCA regulatory knowledge enhanced consumer attention to and recognition of risk information in the DTC ad; (2) DTCA regulatory knowledge moderated the prominence effects such that among less knowledgeable consumers the prominence effects were maximized, whereas the effects were minimal among more knowledgeable consumers; (3) higher prominence were more effective for attention and memory; (4) DTCA regulatory knowledge and prominence effects operated through perceived attention on consumer memory of risk information. Taken together, the overall findings support the current study's theoretical framework. In the following sections, the theoretical, managerial, and consumer education/public health implications of this research are discussed.

Theoretical Implications

The present research contributes to the theory of DTCA in several ways. In general, more prominent risk disclosure enhances consumer memory of information and thereby could reduce *errors* and *biases* in consumer decision making (Andrews, 2011). Given this, prominent risk disclosure provision could counterbalance potential misperception about health risks of the product use (Kozup, Creyer, & Burton, 2003). For instance, Andrews, Netemeyer, and Burton (2009) found that prominently presented disclosures contribute to reducing misleading perceptions about ad nutrition disclosures. Therefore, consumers need to be informed about important product's attributes including benefit and risk information, through prominent information presentation, so that they can make informed health decisions.

However, are the prominence effects always consistent? In the current research, DTCA regulatory knowledge was found to not only moderate such effects but also directly affect consumers' coping strategies of risk disclosure in DTCA. This is an interesting finding in that prior research has exclusively examined the role of general health literacy regarding consumer health information processing (e.g., Baer, Allen, & Braun, 2000; Wolf, Davis, Tilson, Bass, & Parker, 2006; Kickbusch & Ratzan, 2001). DTCA regulatory knowledge has been largely ignored in the literature despite its potential consequences on consumer response to the ad.

A few DTCA studies have examined the role of consumers' subjective knowledge about health and medicine in general (e.g., An, 2007). However, DTCA regulatory knowledge may represent a distinct aspect of consumers' cognitive structure regarding prescription marketplace. While research on health literacy focuses more on particular health issues (Chang, 2008; Jorm, Barney, Christensen, Highet, Kelly, & Kitchener, 2006), DTCA regulatory knowledge represents

consumers' marketplace persuasion knowledge as a DTCA persuasion coping strategy.

In this regard, Friestad and Wright (1994) propose that marketplace beliefs consist of three broad knowledge dimensions including topic knowledge, agent knowledge, and persuasion knowledge. Among the three, in the current research, DTCA regulatory knowledge was conceptualized as consumers' persuasion knowledge about the FDA's regulatory role for DTCA. It is possible that some may conceptualize DTCA regulatory knowledge as agent knowledge, because it may also represent consumers' awareness of how pharmaceutical advertisers must comply with the FDA regulation. However, beyond such classification, a more important point of DTCA regulatory knowledge may be that such marketplace knowledge enables consumers to recognize, analyze, interpret, evaluate, and remember persuasion attempts, and to select and execute coping tactics regarding DTCA health claims, including benefit and risk information (Boush et al., 2009; Friestad & Wright, 1994). In this sense, borrowing from the term used by Friestad and Wright (1994), this research views DTCA regulatory knowledge as health consumers' DTCA health information coping strategy. Although various types of marketplace knowledge can be conceptualized and operationalized, this study is one of the first steps to empirically examine the conceptual framework of PKM in the context of DTCA.

In addition, the moderating role of DTCA regulatory knowledge on the prominence effects deserves attention. The regression slope analyses clearly support the theoretical prediction of the current research on the interactive relationship between DTCA regulatory knowledge and prominence on consumer response to the ad. As DTCA regulatory knowledge increased, the prominence effects became less significant, whereas as DTCA regulatory knowledge decreased the prominence effects became more significant. One possible interpretation of this finding is

that although prominence has an impact on consumer attention to and memory of risk information in general, the effects would be more significant among less knowledgeable consumers than more knowledgeable consumers. As discussed, high DTCA regulatory knowledge consumers are more likely to easily locate and utilize risk information from DTCA, and therefore they are less likely to be affected by message presentation formats such as prominence. However, low DTCA regulatory knowledge consumers are less likely to easily locate and process less prominent risk disclosure, and therefore their attention and memory performance will largely hinge on the extent of risk disclosure prominence. This implies that information presented in the way to reduce cognitive efforts (e.g., high prominence) are more likely to be easily picked out and utilized by low DTCA regulatory knowledge consumers. However, when risk disclosure was presented less prominently, low DTCA regulatory knowledge consumers' information retrieval performance was significantly lower than when risk disclosure was presented more prominently.

The focus on consumer memory of this research also has a theoretical implication. The current research addresses important risk disclosure objectives outlined by prior research. Wilkie (1985) identified nine specific objectives that should be considered in designing risk disclosure: (1) legibility, (2) prominence, (3) attention value, (4) changing consumer awareness, (5) changing consumer beliefs, (6) personalizing consumer beliefs, (7) changing consumer attitudes, (8) changing consumer intentions, and (9) changing consumer behavior. The current research especially addresses three aspects of consumer response to risk disclosure information: prominence, attention value, changing consumer awareness. In particular, memory represents consumer awareness from risk disclosure.

Additionally, the unique contribution of this research to the DTCA literature is that this study addresses an under-examined aspect of risk disclosure processing, through investigating a consumer-side factor: DTCA regulatory knowledge. The above nine risk disclosure objectives may not be easily achieved without considering consumers' individual differences in cognitive structure given the considerable influence of such factors in consumer information processing. Depending on varying consumers' cognitive schemas, the risk disclosure effects may vary considerably. Based on this, understanding the conditions in which the disclosure effects can be enhanced or reduced, should be considered an important research initiative.

This research also shows that the DTCA literature can benefit from borrowing information processing theories (e.g., Deshpande & Krishnan, 1981; Mazis & Staelin, 1982). Despite the potential usefulness of information processing theory in designing consumer disclosure programs (Jacoby & Small, 1975; Wilkie & Gardner, 1974), little empirical research has applied and examined the utility of information processing theory with regard to risk disclosure effects to date in the DTCA context. Recently, some researchers shed new light on the importance of information processing theory in the context of DTCA research (e.g., Davis & Meader, 2009, Davis, 2010; Macias & Lewis, 2006; Macias et al., 2007, 2010). The current research further suggests that more research needs to be conducted using various theoretical perspectives and various cognitive variables to better understand consumers' risk disclosure processing.

In closing this section, simply providing risk disclosure to consumers may be insufficient because consumers should be able to access and process the information properly. The notion of DTCA regulatory knowledge suggests that consumer information processing is largely affected

by the extent to which consumers are knowledgeable about the information category rather than the content itself. Researchers should examines which cognitive factors can affect risk information processing. In this sense, while the current research found significant prominence effects in consistent with previous research findings, more interesting findings may be the direct and moderating effects of DTCA regulatory knowledge on consumer memory of risk information.

Finally, one intriguing future research will be on whether higher levels of DTCA regulatory knowledge could always promote consumers' sound health decisions. The cognitive inference literature notes that in some cases consumer expertise may lead consumers to ignore important information from the environment due to over-confidence (Alba & Hutchinson, 1987). This implies that high levels of knowledge will not be always beneficial for information processing. Given that consumers' knowledge calibration could be distorted by over-confidence, inaccurate self-knowledge calibration would impede sound health decisions. In this case, even though important risk information is presented prominently, highly knowledgeable consumers are likely to disregard it. Researchers describe this phenomenon using a term "a U-tern relationship" between knowledge levels and consumer information processing accuracy (Kavadas et al., 2007; Stewart & Martin, 2004). Because addressing this inquiry goes beyond the current research scope, future research needs to illuminate this theoretical curiosity.

Managerial Implications

The current research provides practical insights into the design and target segmenting of DTCA. Based on the well-known knowledge that varying levels of risk disclosure prominence

could lead to disproportional effects on consumer memory of information (Cowley & Barron, 2008), DTC advertisers need to identify optimized levels of prominence when they develop the design of risk disclosure in DTC ads. For instance, when advertisers present product attribute or efficacy information, it has been known that more prominent messages are superior to less prominent ones in term of consumer recall and evaluations (Gupta & Lord, 1998).

However, based on the current research findings, it is hard to say that more prominent information provision is always the best policy for advertisers. Marketers should consider relevant consumer characteristics to achieve the intended marketing goals (Cowley & Barron, 2008). Although information prominence increases consumer memory in general, under specific circumstances prominence may have a minimal impact on consumer evaluations of brands (van Reijmersdal, 2009).

How can DTC advertisers achieve the intended marketing goals (e.g., market volume expansion), while simultaneously complying the FDA regulation? The two-sided message literature suggests useful insights. Two sided message refers to the message that presents both positive and negative information about the product (Crowley & Hoyer, 1994). Once well-executed, two-sided messages can enhance source credibility (Eisend, 2006, 2010), and such enhanced credibility can increase overall persuasiveness of the messages (Wilson & Sherrell, 1993).

Given reportedly prevalent consumer skepticism in contemporary marketplace (Boush et al., 2009; Obermiller & Spangenberg, 1998), rightly provided risk disclosure may offset the negative impression of the product. Specifically, *attribution theory* suggests that individuals assign causes to observed behavior to better understand their environment (Eisend, 2010). In this

regard, acknowledging potential health risks of the drug in ads may positively contribute to consumer evaluations of the drug and advertiser, because it can be perceived as complying with the regulation and thereby as credible.

In particular, when consumers' DTCA regulatory knowledge is high, fair balance between benefit and risk information would be more beneficial for pharmaceutical advertisers. This is because most consumers nowadays recognize that DTCA is required to present health risks of the drug in ads by law. Eisend (2006) notes that consumers' perceived marketer compliance to law can positively affect advertising evaluations. Therefore, advertisers need to comply with the DTCA fair balance requirement not only to avoid legal and ethical accusations, but also to achieve more favorable consumer reactions. Given that the major marketing goal of DTCA is to expand prescription volume, fair balanced DTCA can contribute to such marketing goals, while simultaneously contributing to social responsibility. Currently, this research phenomenon is not fully examined. More empirical research should provide solid evidence regarding this theoretical prediction in order to provide practical insights.

Consumer Education and Public Health Implications

The findings of this research also address consumer education and public health implications. The risk disclosure requirement is based on the assumption that consumers are able to access and process, and thereby weigh the risks appropriately to make informed health decisions (Calfee, 2002; Cox et al., 2010). However, an important question remains regarding how well consumers utilize risk information in the DTC ad. Given that DTCA serves as an important public health education channel these days, several points need to be noted.

First, information about the drug's risks as well as benefits should be attended sufficiently, in order to render them to be stored and retrieved appropriately when consumers make health decisions. However, concerns about consumers' proper use of health information in DTCA call for a more meticulous examination about not only the way information is delivered, but also how consumer factors affect information processing (Mackert, 2011). It is worth noting generally accepted communication process models such as Mcguire's (1976) steps in information processing (i.e., exposure, attention, comprehension, attitude, retention, retrieval, decision making intentions, and behavior). Recently, Wogalter (2006) refined the McGuire's classical information processing model and proposed the communication-human information processing (C-HIP) model in the context of risk communication. Based on these information processing models, the point is clear. A message sent by the advertiser is not always interpreted by the receiver as the sender intended. To better understand this discrepancy, taking consumer perspectives into account can provide insight into how risk information can be more effectively communicated (Davis, 2010; Davis & Meader, 2009; Hoek et al., 2011; Mantel, 2010; Menon, Deshpande, Perri III, & Zinkahn, 2003a, 2003b). Among others, researchers are advised to examine consumers' varying cognitive structures to enhance risk communication effectiveness.

Despite the severe debate over the DTCA category, if relevant and timely health risk information can be conveyed to health consumers, DTCA can contribute to public health as an important health education source (Kaphingst & Dejong, 2004; Royne & Myers, 2008). However, the current research shows that the use of risk information from DTCA largely hinges on consumers' DTCA regulatory knowledge. When consumers have certain levels of DTCA regulatory knowledge, the effectiveness of risk disclosure may be ensured. However, when a

majority of consumers do not have sufficient DTCA regulatory knowledge, the importance of prominent risk disclosure provision increases. Considering the relatively low consumer DTCA regulatory knowledge level in the current research sample, the current FDA's concern about risk disclosure prominence may be reasonable.

However, in the long term, the current research findings suggest that consumer education by the FDA and pharmaceutical advertisers may play a promising role for consumers' informed health decision making. Hoy and Andrews (2004) note that consumer education by government agencies, industry trade associations, and consumer advocacy groups can help consumers better understand complicated ad information. In this regard, the FDA and pharmaceutical manufacturers' voluntary association (PhRMA) have exerted efforts to improve consumers' perception and behavior regarding DTCA. However, the current research suggests that consumer education about the FDA's regulatory role for DTCA may also help consumers better cope with risk disclosure information in DTCA.

In some sense, DTCA regulatory knowledge can be viewed as consumers' media literacy as part of overarching marketplace persuasion knowledge. Extending the PKM perspective (Friestad & Wright, 1994), consumers' enhanced media literacy about DTCA may improve their DTCA health information coping strategies. In particular, greater DTCA regulatory knowledge will improve consumer processing of important health risk information of the prescription medicine.

As the current research adopts DTCA regulatory knowledge measures from the current FDA's webpage, the FDA can provide useful health and media literacy programs on its website (e.g., *For Consumers & Patients*). Consumers can benefit from such information sources for not

only health education but media literacy improvement. In the same manner, consumers can also obtain a lot of useful educational information from pharmaceutical advertisers' promotional websites and various public educational sources. In particular, the Internet serves as an important health information source (Dutta-Bergman, 2004; Lee, Park, & Widdows, 2009; Suggs, 2006). Consumer health and media literacy programs should be executed through various media channels.

Unfortunately, current levels of public understanding of the FDA's regulatory role for DTCA appeared to be low. Bell, Kravitz, and Wilkes (1999) and Wilkes, Bell, and Kravitz (2000) examined what assumptions consumers make about the regulation of DTCA. The results (Wilkes, Bell, & Kravitz, 2000) showed that half of respondents believed that DTCA had to be submitted to the FDA for prior approval, 43% of them believed that only completely safe drugs could be promoted directly to consumers, 22% of them believed that promoting of drugs with serious side effects had been banned, and 21% of them thought that only extremely effective drugs could be marketed directly to consumers. However, given that all of these statements are untrue, the results imply that there is a possibility that consumers may have a serious misunderstanding regarding the DTCA's regulatory context. In particular, as to minorities they were more misinformed about the DTCA regulation than were white respondents (Bell et al., 1999). Bell et al. (1999) note that many consumers hold inaccurate beliefs regarding the regulation of DTCA and this false faith could increase susceptibility to DTCA, because consumers with erroneous assumptions are more likely to act on them.

The statements employed in previous research on public's knowledge of DTCA regulation (e.g., Bell et al., 1999; Wilkes et al., 2000) appear to be closely analogous to those

employed in the current research. This research employed various statements to measure consumers' DTCA regulatory knowledge, which were borrowed from the FDA's consumer education webpage. In that regard, the findings of this research provide invaluable consumer education and public health implications, which is a unique contribution of the current research. It may be both the FDA's and pharmaceutical marketers' responsibility to inform consumers about critical aspects of DTCA regulation. To help consumers make better prescription decisions, both the FDA and pharmaceutical marketers should exert organized efforts to inform consumers regarding the regulatory context of DTCA through various methods. In the long term, pharmaceutical marketers should communicate risk information openly and accurately with consumers. In particular, they need to provide much attention to health risks of the medicine.

From the FDA's perspective, the agency can fully educate the role of promotional materials or prescription drug brands, the role of drug evaluations, and the need for consumers to cooperate with health care professionals (Wilkes et al., 2000). Furthermore, health care professionals can also develop a systematic media literacy program to educate consumers about the promotional nature of DTCA as well as the regulatory context of DTCA (Bell et al., 1999; Wilkes et al, 2000) to promote important health care marketplace persuasion knowledge. Moreover, the public needs to be informed about the limitations of DTCA placed on its regulation. To do so, Bell et al. (1999) suggest that the development of a media literacy program that teaches about the nature of pharmaceutical advertisers' persuasive strategies with cooperation on the part of the FDA, health care professionals, and public health organizations will contribute to public health. Importantly, health consumers themselves should exert efforts to make informed and sound health choices based on accurate and comprehensive understanding of

health information regarding both benefits and risks of medical remedies. For true health consumerism, it is also individuals' responsibility to behave actively as health consumers.

In this regard, the Pharmaceutical Research and Manufacturers of America's (PhRMA) (2009), an organization representing pharmaceutical companies, industry guidelines for DTCA outline an important premise that:

> DTC advertising of prescription medicines can benefit the public health by increasing awareness about diseases, educating patients about treatment options, motivating patients to contact their physicians and engage in a dialogue about health concerns, increasing the likelihood that patients will receive appropriate care for condition that are frequently under-diagnosed and under-treated, and encouraging compliance with prescription drug treatment regimens.

In the above voluntary guidelines, an important goal of DTCA is well-illustrated. That is, DTCA should encourage consumers to get proper medical treatment based on proper health education. Despite potential health risks of the drug, consumers should have a chance to discuss with their doctors about the advertised drug, in order to find out the best medical remedies to manage their own health issues. The current research adds that consumers also need to be educated about the FDA's regulatory role for DTCA to better cope with DTCA health information, especially risk disclosure.

In closing this section, there has been a long severe controversy regarding the role of mass media between its health promotion and worsening functions (Wallack, 1989, 1990). Proponents believe that mass media can provide the right health information to the right people in the right way at the right time, whereas critics argue that mass media could be a barrier to health education because media institutions are supposed to be driven by profit (Wallack, 1989). However, one thing for sure is that mass media play an important role in communicating relevant health information to the public, by setting the public's health agenda and contributing to

preventive and remedial health behaviors (e.g., McGuire, 1984; O'Keefe & Reid-Nash, 1986).

However, despite the potential contribution of DTCA to public health, the literature has ignored how risk information can be better communicated from the consumer perspective (Hoy & Andrews, 2004). Stewart and Martin (2004) note that "regulation of marketing communication should not be less consumer centric" (p. 190). Although this idea is not original, the complexity of consumer information processing calls for research that measures consumer response to disclosure information. Considering the findings of the current research, it is clear that one needs to consider how consumers actually perceive health risks of the drug and utilize such information in their health decision making. Among various consumer side-factors, the current research especially explored the potential role of DTCA regulatory knowledge as pharmaceutical marketplace persuasion knowledge. Organized efforts to improve consumer DTCA regulatory knowledge through various education programs could contribute to public health through consumers' informed health decision making.

CHAPTER 6: LIMITATIONS AND FUTURE RESEARCH RECOMMENDATIONS

As with most studies, several important limitations of the study and avenues for future research warrant mention. First, although the current research employed a professional online survey company to reach a relatively representative US adult sample, caution should be taken on generalizing the results to other contexts, because the respondent recruiting method was a convenience sampling in nature. More often than not, it is not easy for researchers to reach a fully US representative adult sample due to the limited time and resources. Nevertheless, one alternative remedy to reduce potential response biases in the data of this study was the utilization of random assignment (Kerlinger & Lee, 2004; Shadish et al, 2002; Wimmer & Dominick, 2006). The survey software, Qualtrics, allowed the researcher to randomly assign respondents to each treatment condition. Further, to counterbalance any order effects in multiple choice questions, the researcher also randomized choice presentation orders for major dependent variables (e.g., recognition). However, future research needs to examine various contexts and utilize more representative populations to replicate and extend the current research findings.

Second, when applying the findings of this research to other cultural contexts, careful considerations should be exerted. Currently, DTCA is allowed in only two countries in the world (Royne & Myers, 2008): the US and Newzealand. Although many countries currently consider the legalization of the DTCA practice (e.g., South Korea), most DTCA studies have been conducted exclusively in the US and Newzealand contexts. In this regard, the interpretation of the current research findings should be limited to the US context because the regulatory environment and research participants were based on the US context.

However, a promising future research avenue could address different consumer

information processing mechanisms across different cultural contexts. For instance, different styles of risk appraisal or avoidance of uncertainty could influence consumer processing of risk disclosure in DTCA differently. For instance, it has been well documented that collectivistic and individualistic cultures have their preferred regulatory orientation. Collectivists are more likely to be prevention-focused and individualists are more likely to be promotion-focused (Lee, Aaker, & Gardner, 2000). This implies that consumers' receptivity of risk disclosure in DTCA or medical product advertising can be different across different cultural schemas. In a similar vein, Hoy and Andrews (2004) note that different risk disclosure presentation modalities may work in different ways across distinct countries. Further, they suggest that risk disclosure research on cultural differences can contribute to global consumer interests (Hoy & Andrews, 2004). The current research adds that such program of research can expand the scope of DTCA risk disclosure research by incorporating global health consumerism perspectives, because health care empowerment is increasingly receiving global attention.

Third, in terms of the manipulation of risk disclosure prominence, there could be various considerations and alternatives. According to the FDA's (2009) draft guidance for risk communication in DTCA, this research employed several widely used message execution factors to highlight risk disclosure. However, risk disclosure prominence can be conceptualized and operationalized in many ways. More often than not, the concept of *fair balance* is defined in terms of the relative amount of benefit and risk information (Huh & Cude, 2004; Sheehan, 2007; Macias et al., 2007). Some studies define prominence in terms of relative placement and modality of risk information (Davis, 2010). Typographical devices such as box-warnings are also utilized for operationalizing prominence (Kees, Bone, Kozup, & Ellen, 2008). However, in this

research, to reflect the FDA's (2009) current thought on fair balance in DTCA, several message factors were utilized simultaneously to probe consumers' *net impression* other than their reactions to particular aspects of the ad. Future research can examine risk disclosure prominence though different conceptualizations and operationalizations.

Fourth, this research did not pay much attention to the interactive roles of benefit and risk information on consumer response to the ad, because the focus of research was on risk disclosure prominence. However, an additional analysis revealed that despite the exactly equivalent content and format for the uses of the drug across different test ads, the perceived prominence of the uses of the drug (as a confounding check) was slightly different, depending on varying risk disclosure prominence levels. One intriguing speculation would be that consumer perception could be affected by the interactive influence of benefit and risk information. In the additional analysis, the researcher found that as risk disclosure prominence increased, perceived prominence of drug use information decreased, though it was not statistically significant. One future research avenue will be examining the interactive effects of benefit and risk information presentation formats on consumers' perception. In line with this, the FDA (2009) is concerned about overall *impression*. However, what is lacking in the FDA's guidance for risk communication is the recognition that surface-level fair balance cannot secure intended risk disclosure outcomes. Consumer perception will be largely context-driven. A program of research on this research inquiry is warranted.

Fifth, the present research did not address the content effects. However, the content of risk disclosure itself as well as its format can influence consumer response to the ad. It has been known that perceived severity of health risks affects consumers' health behavior (Carpenter, 2010). Varying levels of health risk perception can lead to different response to the ad. Given

that prescription drugs can be purchased only through prescription from health professionals, it is implied that prescription drugs' health risks may be more serious than those of over-the-counter drugs that can be purchased without prescription. However, different therapeutic categories and brands may have different health risks and therefore the effects of risk disclosure will be affected by the health risk content itself. Moreover, it is possible that the format and content of risk disclosure may interact from one another. Researchers may need to differentiate between the effects of the content and format of DTCA.

Sixth, this study examined print media type DTC ads even though it was presented in an online survey through the Internet. A number of branded DTCA websites present information about the drug including benefit and risk information in a similar manner with print DTCA. However, various media interfaces have unique technological characteristics. A body of research has examined branded prescription drug websites to examine the content of DTCA and their message appeals (e.g., Huh & Cude, 2004; Sheehan, 2007; Wymer, 2010). Such interactive media may utilize various information provision modalities such as voice and video (Davis, 2010). In line with this, different media interfaces call for different consideration of risk disclosure presentation (Hoy & Andrews, 2004). For instance, interactivity could be considered an important factor affecting prominence (Cauberghe & Pelsmacker, 2010). Applying to the DTCA context, the Internet or mobile devices may lead researchers to conceptualize and operationalize risk disclosure prominence differently. However, little research has examined the risk disclosure prominence effects in the rich media contexts. Future research can address how the different media contexts relate to varying consumer information processing mechanism of risk disclosure prominence.

Seventh, although the current research employed a perceived attention measure to assess consumer attention to risk disclosure in DTCA, a concern could be raised about the self-report single-item measure for the construct. As discussed in the method section, there is a practical utility of perceived attention approach. Nevertheless, a more reliable measure will be physio-psychological approaches. In addition, regarding the timing of measuring perceived attention, there could also be a concern about demand characteristics, because some manipulation checks of risk disclosure prominence that may signal health risks of the drug were positioned before the perceived attention measure. Due to a potential discrepancy between objective and subjective measures, a more objective and accurate measure to assess to what information a person attended may be via eye-tracking. For instance, when subjects claim to have looked at risk disclosure information through self-reported answers, it is possible that they did not look at all. This indicates that subjective self-report attention measures may have limitations and therefore could serve only as a proxy measure of actual attention. Researchers should pay careful attention to interpret the results when using subjective measures.

As an alternative for future research, eye tracking approach is a technique whereby subjects' eye movements are measured so that the researcher understand where an individual is looking at any given time, and the sequence in which their eyes are shifting from one location to another (Poole & Ball, 2005). This method has been used in the advertising literature to determine what advertisement designs attract the greatest attention (Lohse, 1997) and to determine if Internet users pay attention to banner advertising on websites (Albert, 2002). Of course, as with every experimental methods, eye tracking does not represent a perfect approach for attention research. Rather, there could be a list of cautions that researchers should bear in

mind when applying the method. Among others, subjects should have well-defined tasks to carry out so that their eye movements can be appropriately attributed to actual cognitive processing (Poole & Ball, 2005). That is, eye movements per se cannot guarantee accurate cognitive processing measurement. Eye tracking researchers can employ various methodological devices in combination to address this limitation (Poole & Ball, 2005).

Eighth, the measurement of DTCA regulatory knowledge may have limitations. The most common way to measure knowledge has been multi-item scales¸ having two to four items (e.g., Beatty & Smith, 1987; Park et al., 1994). Although good reliabilities have been reported for such multi-item scales, they were all essentially ad hoc, generated for the first time for the purpose at hand, and were not validated or employed in another study (Flynn & Goldsmith, 1999). This is also the case in the current research. Despite the conceptual originality and its public education and health implications, the multi-item measurement scale of DTCA regulatory knowledge in the current research shows low reliability (Chronbach's $\alpha = .29$). Statistically speaking, when true/false type test answers are coded as dummy variables to form a composite score to represent varying knowledge levels, it is likely that the internal consistency value (i.e., Cronbach's alpha) for the categorical items is low. For instance, House et al. (2004) measured consumers' objective knowledge about the facts and issues concerning genetic modification in food production in order to examine its effects on consumers' willingness to accept genetically modified foods, and found significant knowledge effects. They employed four-item true/false type questions. However, its measurement scale reliability was relatively low (i.e., Cronbach's $\alpha = .54$).

In this case, a more appropriate description for such type of measurement items may be the percentage of correct answers for each item. In that regard, the current research illustrates the

descriptive statistics for each item. Nevertheless, it is suggested that future research develops a reliable measurement scale for DTCA regulatory knowledge so that some degree of measurement standardization in DTCA research can be attained. At this moment in time, considering that there is a dearth of research on this construct in the DTCA literature, the exploratory approach to measuring DTCA regulatory knowledge may be justified.

Ninth, the subjects of the current research consists of higher percentage of males (63.6%) than that of females (36.4%). This could be a lack of representation of the profile of actual users of Rx anti-depressant. Future research may employ a more representative sample profile to better represent the current antidepressant users. However, it is noteworthy that according to CDC, in terms of gender, during 2007-2010 5.3% of male respondents reported that they have used antidepressants, while 11.9% have used antidepressants in past 30 days (CDC, National Center for Health Statistics. Health, United States, 2012). The percentage of male users have rapidly increased from 1.2% during 1988-1994, to 4.4% during 1999-2002, and to 5.3% during 2007-2010. Considering the educational role of DTCA, the current research finding may provide insight into potential antidepressant users' (i.e., males) response to antidepressant DTCA.

Tenth, the sample of the current research represents general adult consumers rather than individuals who have been diagnosed with the disease. Approximately 30% of subjects reported having been diagnosed with mental depression. This could be justified when considering that the major purpose of DTCA is not only to increase consumer generated prescription volume but also provoke and facilitate an initial self-diagnosis from DTC ads (Davis, 2006). In the current research, given its focus on health risk information in DTCA, a list of questions were given to subjects to probe their direct or indirect experience with adverse reactions after taking a

prescription drug, including personal experience (48.5%), family (38.3%), relatives (35.2%), your circle of friends (31.1%), your circle of neighbors (13.6%). These results show that approximately half of the subjects have experienced any health risks from the use of prescription drugs and at least 30% of them have indirect experience with health risks regarding prescription drug use. While individuals with depression diagnosis experience could be an appropriate sample of antidepressant DTCA research, given the focus of research on risk disclosure processing and the role of DTCA regulatory knowledge, the use of the current sample seems plausible. Future research can employ individuals with direct depression experience to examine how DTCA regulatory knowledge and prominence work differently among such consumers.

Eleventh, future research may need to provide basic information about clinical depression in the research instrument. According to research, there was significant increase in the proportion of people recognizing depression in the vignette during 1998-2004 in Australia. For instance, compared with 1998, in 2004 mental health literacy including depression recognition increased considerably (Goldney, Fisher, Dal Grande, & Taylor, 2005). In a similar vein, the current research subjects show a reasonably good understanding of what clinical depression is through perceived familiarity, subjective knowledge, and perceived importance. Nevertheless, it is possible that many US consumers may not be able to clearly differentiate between clinical depression and short periods of sadness. Future research instruments could clarify what clinical depression is to provide a foundation to research participants.

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APPENDICES

Appendix A: Survey Questionnaire

Thank you for your willingness to participate in this study. Ilwoo Ju (Doctoral Candidate) at the University of Tennessee is the primary investigator of this study, and is attempting to understand the use of health information among adults.

There are no anticipated risks for study participants. However, if you do not wish to answer a question, you may skip it. Participation is voluntary. If you wish to quit the project at any time, you can simply close the survey.

If you have questions about the study or the procedures, you may contact the primary researcher Ilwoo Ju by mail at 401 Student Services Building, Knoxville, TN 37996, by phone at (865) 318-4004, or by e-mail at iju@utk.edu. If you have questions about your rights as a participant, contact Brenda Lawson in the Office of Research & Engagement at (865) 974-7697 or blawson@utk.edu.

The information you provide will be anonymous. You will not be identified individually at any stage of the study. The data and your informed consent will be stored in a secured place (the University of Tennessee Communication College Doctoral Office) during the analysis for 3 years and will be destroyed afterwards. You must be age 18 or older to participate.

By clicking this link, you indicate your consent to participate and that you are at least 18 years old.

The primary focus of this survey is on your thoughts and feelings about health issues in general. Please read carefully and answer the following questions.

Q1) How would you rate your overall health at the present time?

poor ☐ fair ☐ good ☐ excellent ☐

Q2) How familiar would you say you are with the issue of clinical depression?

not at all familiar ☐ ☐ ☐ moderately familiar ☐ ☐ ☐ very familiar

Q3) How knowledgeable would you say you are about clinical depression?

not at all knowledgeable ☐ ☐ ☐ ☐ ☐ ☐ ☐ very knowledgeable

Q4) How important is the issue of clinical depression to you?

not at all important ☐ ☐ ☐ ☐ ☐ ☐ ☐ very important

Q5) Have you ever been diagnosed with clinical depression?

Yes _____ No_____

Q6) In the following questions, please report your opinions about prescription drug advertising.

Note: "Prescription drug" refers to a drug you can get only with a doctor's prescription.

6-1) Prescription drug advertising is truth well told.

strongly disagree ☐ disagree ☐ somewhat disagree ☐ neither agree nor disagree ☐ somewhat agree ☐ agree ☐ strongly agree ☐

6-2) Prescription drug ads generally present a true product picture.

strongly disagree ☐ disagree ☐ somewhat disagree ☐ neither agree nor disagree ☐ somewhat agree ☐ agree ☐ strongly agree ☐

6-3) We can depend on getting the truth in most prescription drug advertising.

strongly disagree somewhat neither agree nor somewhat agree strongly

disagree		disagree	disagree	agree		agree
☐	☐	☐	☐	☐	☐	☐

6-4) I am accurately informed by most prescription drug ads.

strongly disagree	disagree	somewhat disagree	neither agree nor disagree	somewhat agree	agree	strongly agree
☐	☐	☐	☐	☐	☐	☐

6-5) Prescription drug advertising is a reliable source of information.

strongly disagree	disagree	somewhat disagree	neither agree nor disagree	somewhat agree	agree	strongly agree
☐	☐	☐	☐	☐	☐	☐

6-6) Prescription drug advertising's aim is to inform the consumer.

strongly disagree	disagree	somewhat disagree	neither agree nor disagree	somewhat agree	agree	strongly agree
☐	☐	☐	☐	☐	☐	☐

6-7) Most prescription drug advertising provides consumers with essential information.

strongly disagree	disagree	somewhat disagree	neither agree nor disagree	somewhat agree	agree	strongly agree
☐	☐	☐	☐	☐	☐	☐

6-8) Prescription drug advertising is informative.

strongly disagree	disagree	somewhat disagree	neither agree nor disagree	somewhat agree	agree	strongly agree
☐	☐	☐	☐	☐	☐	☐

Q7) For each statement, please check a box to report your beliefs about prescription drug advertising.

Note: "Prescription drug" refers to a drug you can get only with a doctor's prescription.

7-1) The FDA bans consumer-directed ads for prescription drugs that have serious health risks.
Yes_____ No_____ Don't know _____

7-2) The FDA requires drug companies to use hard-to-understand medical language in prescription drug ads directed to consumers.
Yes_____ No_____ Don't know _____

7-3) The FDA works with drug companies to create prescription drug ads directed to consumers.
Yes_____ No_____ Don't know _____

7-4) The FDA approves prescription drug ads before they are seen by the public.
Yes_____ No_____ Don't know _____

7-5) The FDA regulates the design of prescription drug ads directed to consumers.
Yes_____ No_____ Don't know _____

7-6) The FDA conducts research to examine consumer attitudes and behaviors toward prescription drug advertising.
Yes_____ No_____ Don't know _____

Q8) Please report your past experiences with prescription drugs.

Q8-1) Have you ever experienced adverse reactions after taking a prescription drug?
Yes_____ No_____ Don't know _____

Q8-2) Has anyone in your family experienced prescription drug adverse reactions?
Yes_____ No_____ Don't know _____

Q8-3) Has anyone among your relatives experienced prescription drug adverse reactions?
Yes_____ No_____ Don't know _____

Q8-4) Has anyone within your circle of friends experienced prescription drug adverse reactions?
Yes_____ No_____ Don't know _____

Q8-5) Has anyone within your circle of neighbors experienced prescription drug adverse reactions?
Yes_____ No_____ Don't know _____

Q9) Please check a box to indicate your agreement with the following statement.

"If someone hasn't experienced prescription drug adverse reactions by now, he or she is not likely to experience them later in life."

strongly disagree	disagree	somewhat disagree	neither agree nor disagree	somewhat agree	agree	strongly agree
☐	☐	☐	☐	☐	☐	☐

Q10) In the past six months, how often have you seen, read, or heard instances where the health risks of prescription drugs are depicted or discussed in the following media types?

	never			occasionally			very often
Television news, documentaries, and current affairs.	☐	☐	☐	☐	☐	☐	☐
Television entertainment programs (e.g., soap operas, sitcoms, drama, movies).	☐	☐	☐	☐	☐	☐	☐
Articles in newspapers and magazines.	☐	☐	☐	☐	☐	☐	☐
Non-advertising information from the Internet.	☐	☐	☐	☐	☐	☐	☐

Imagine that you feel like you may be clinically depressed and have just come across the webpage for a new prescription medicine for depression.

Please read the ad as you would if you were at risk of depression in your real life.

The following questions are about the ad you just saw. Please read and answer them carefully.

Q11) The ad presented information about the uses and health risks of Luminexell. Please check a box that best represents your thoughts.

The ad presented the uses of Luminexell more prominently than its health risks	☐
The ad presented the health risks of Luminexell more prominently than its uses	☐
The ad presented the uses and health risks of Luminexell equally in terms of prominence	☐

Q12) How prominently do you think the ad presented the uses of Luminexell?

not at all prominently						extremely prominently
1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐

Q13) How prominently do you think the ad presented the health risks of Luminexell?

not at all prominently						extremely prominently
1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐

Q14) In the following, for each statement please check a box to indicate your level of agreement.

	strongly disagree	disagree	somewhat disagree	neither agree nor disagree	somewhat agree	agree	strongly agree
It was easy to find the information about the health risks of Luminexell	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐
It was easy to focus on the information about the health risks of Luminexell	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐

	1	2	3	4	5	6	7
I liked the way the ad presented the information about the health risks of Luminexell	☐	☐	☐	☐	☐	☐	☐

Q15) How much attention did you pay to the information about the health risks of Luminexell?

no attention			moderate attention			great attention
☐	☐	☐	☐	☐	☐	☐

Q16) The ad presented the health risks of Luminexell. In the box below, please write all the health risks of Luminexell you can recall from the ad.

Q17) How easy do you feel it was to recall the health risks of Luminexell presented in the ad?

extremely easy						extremely difficult
☐	☐	☐	☐	☐	☐	☐

Q18) Which of the following were presented in the ad as the health risks of Luminexell? Please check all that apply.

- ❑ Seizures
- ❑ Decrease in white blood cells
- ❑ High fever
- ❑ Lightheadedness upon standing
- ❑ Trouble swallowing
- ❑ Rigid muscles
- ❑ Impairment in motor skills
- ❑ Insomnia
- ❑ Increased heart rate
- ❑ Abnormal facial movements

Q19) Given the above check list, how easy do you feel it was to recognize the health risks of Luminexell presented in the ad?

extremely						extremely

easy difficult

☐ ☐ ☐ ☐ ☐ ☐ ☐

Q20) Imagine that you take Luminexell to treat clinical depression. Then I would like you to think of people your own age and sex who also take the drug. **Compared with other people your age and sex**, how would you rate your chances of experiencing the adverse reactions of Luminexell?

far less likely	less likely	slightly less likely	about the same likelihood	slightly more likely	more likely	far more likely
☐	☐	☐	☐	☐	☐	☐

Q21) What do you believe is the chance that **you** will experience the adverse reactions of Luminexell?

no chance — 50-50 chance — certain to happen

0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Q22) What do you believe is the chance that **the average person your age and sex** will experience the adverse reactions of Luminexell?

no chance — 50-50 chance — certain to happen

0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Q23) How much personal control do you feel you have over the chances of experiencing the adverse reactions of Luminexell?

no control — moderate control — complete control

0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Q24) If you experience the adverse reactions of Luminexell, how serious do you believe they would be?

not at all — moderately — extremely

serious						serious
1	**2**	**3**	**4**	**5**	**6**	**7**
☐	☐	☐	☐	☐	☐	☐

Q25) How safe would you say Luminexell is?

not at all safe						extremely safe
1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐

Q26) If you were to use a prescription drug for treating depression, how likely would you be to choose Luminexell?

not at all likely						extremely likely
1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐

Q27) Imagine that you take Luminexell to treat depression. For each statement, please check a box to indicate your agreement.

	strongly disagree	disagree	somewhat disagree	neither agree nor disagree	somewhat agree	agree	strongly agree
I would like to learn more about the health risks of Luminexell	☐	☐	☐	☐	☐	☐	☐
When I come across other useful information about the health risks of Luminexell, I would like to retain it	☐	☐	☐	☐	☐	☐	☐
I would like to use various media sources to get more information about the health risks of Luminexell	☐	☐	☐	☐	☐	☐	☐

Q28) Please check your gender. Female_____ Male_____

Q29) How old are you? _____ years old

Q30) What is your ethnic background?

White, not Hispanic _____ Hispanic, of any race _____ Black, not Hispanic _____
Asian or Pacific Islander _____ American Indian, Eskimo, or Aleut _____
Other (Please specify) _____

Q31) What is the highest level of education you received?

1. Did not finish high school
2. Completed high school but no college education
3. Some college education but no degree
4. Associate's degree (examples: AA, AS)
5. Bachelor's degree (examples: BA, BS)
6. Attended graduate school but no degree
7. Master's degree (examples: MA, MBA)
8. Professional degree (examples: JD, MD)
9. Doctorate degree (examples: PhD, EdD)

Q32) What is your annual household income?

1. lower than $25,000
2. $25,000 ~ $49,999
3. $50,000 ~ $74,999
4. $75,000 ~ $99,999
5. $100,000 ~ $149,999
6. $150,000 or higher

Q33) What type of device did you use to participate in this survey?

1. Smartphone
2. Tablet PC
3. Laptop computer
4. Desktop computer
5. Other _____(please specify)

Appendix B: Low Prominence Ad Stimulus

Everyone feels sad at times.

People with depression feel sad most of the time.

These feelings can get in the way of everyday life.

When you are depressed, you may also feel tired all the time, lose interest in eating or eat too much, have trouble paying attention and feel constantly nervous.

Depression can be treated with proper medical care. Talk to your doctor about **Luminexell®** if you have noticed these signs for at least 2 weeks to find out what will work best for you.

Uses of Luminexell ®

Luminexell® (venlafaxine) is a once-daily tablet approved to treat Depressi on, Generalized Anxiety Disorder (GAD), Social Anxiety Disorder (SAD), and Panic Disorder (PD) with or without agoraphobia in adults.

Important health risks of Luminexell® include high fever, rigid muscles, increased heart rate, abnormal facial movements and decrease in white blood cells. Call your doctor right away if you have any of these experiences after taking Luminexell®. Common side effects include sweating, nausea, dizziness, drowsiness and feelings of anxiety. For current information about this drug's safety and uses, visit www.fda.gov/cder. Click on "Drugs (at) FDA." Search for Luminexell® and click on drug-name links to see "Label Information." You are encouraged to report adverse reactions of prescription drugs to the FDA. Visit www.fda.gov/medwatch or call 1-800-FDA-1088. See reverse for important information about Luminexell®.

Luminexell® (Venlafaxine)

Appendix C: High Prominence Ad Stimulus

Everyone feels sad at times.

People with depression feel sad most of the time.

These feelings can get in the way of everyday life.

When you are depressed, you may also feel tired all the time, lose interest in eating or eat too much, have trouble paying attention and feel constantly nervous.

Depression can be treated with proper medical care. Talk to your doctor about **Luminexell®** if you have noticed these signs for at least 2 weeks to find out what will work best for you.

Uses of Luminexell®

Luminexell® (venlafaxine) is a once-daily tablet approved to treat Depressi on, Generalized Anxiety Disorder (GAD), Social Anxiety Disorder (SAD), and Panic Disorder (PD) with or without agoraphobia in adults.

Important Safety Information

Health risks of Luminexell® include:

- ❑High fever
- ❑Rigid muscles
- ❑Increased heart rate
- ❑Abnormal facial movements
- ❑Decrease in white blood cells

Call your doctor right away if you have any of these experiences after taking Luminexell®

Common side effects include sweating, nausea, dizziness, drowsiness and feelings of anxiety. For current information about this drug's safety and use, visit www.fda.gov/cder. Click on "Drugs (at) FDA." Search for Luminexell® and click on drug-name links to see "Label Information." You are encouraged to report adverse reactions of prescription drugs to the FDA. Visit www.fda.gov/medwatch or call 1-800-FDA-1088. See reverse for important information about Luminexell®.

Luminexell® (Venlafaxine)

Appendix D: Exploratory Ad Stimulus

Everyone feels sad at times.

People with depression feel sad most of the time.

These feelings can get in the way of everyday life.

When you are depressed, you may also feel tired all the time, lose interest in eating or eat too much, have trouble paying attention and feel constantly nervous.

Depression can be treated with proper medical care. Talk to your doctor about **Luminexell®** if you have noticed these signs for at least 2 weeks to find out what will work best for you.

Uses of Luminexell®

Luminexell® (venlafaxine) is a once-daily tablet approved to treat Depressi on, Generalized Anxiety Disorder (GAD), Social Anxiety Disorder (SAD), and Panic Disorder (PD) with or without agoraphobia in adults.

Important health risks of Luminexell® include high fever, rigid muscles, increased heart rate, abnormal facial movements and decrease in white blood cells. Call your doctor right away if you have any of these experiences after taking Luminexell®. Common side effects include sweating, nausea, dizziness, drowsiness and feelings of anxiety.

For current information about this drug's safety and uses, visit www.fda.gov/cder. Click on "Drugs (at) FDA." Search for Luminexell® and click on drug-name links to see "Label Information." You are encouraged to report adverse reactions of prescription drugs to the FDA. Visit www.fda.gov/medwatch or call 1-800-FDA-1088. See reverse for important information about Luminexell®.

Luminexell® (Venlafaxine)

VITA

Ilwoo Ju is an Assistant Professor of Advertising at Saint Louis University. Prior to joining the SLU faculty in 2014, he served as a faculty member at the University of Akron Communication Department from 2013 to 2014. In addition, he was a Graduate Teaching and Research Associate at the University of Tennessee Communication College from 2009 to 2013. Ilwoo began his higher education at Dankook University in Seoul, South Korea, where he earned his B.A. degree in Journalism and Mass Communication in 2007. During the period of his B.A. study, he served as a squad leader at the 28th Republic of Korea Army Infantry Division's Tactical Communications Battalion from 2001 to 2003. After he completed his B.A. study, he worked as a marketing analyst and planner in the services marketing business from 2006-2007, particularly serving as an integrated marketing communications planner, until entering the Grady College of Journalism and Mass communication at the University of Georgia in 2007, with a focus on Advertising. In 2009, he earned his M. A. degree from the University of Georgia Advertising Department and then entered the Advertising doctoral program in the College of Communication and Information at the University of Tennessee-Knoxville.