

ASSESSING THE RELATIONSHIP OF ATTITUDE TOWARD THE AD TO INTENTIONS
TO USE DIRECT-TO-CONSUMER DRUGS:
A SYSTEMATIC QUANTITATIVE META-ANALYSIS

By

WAN SEOP JUNG

A DISSERTATION PRESENTED TO THE GRADUATE SCHOOL
OF THE UNIVERSITY OF FLORIDA IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

UNIVERSITY OF FLORIDA

2011

© 2011 Wan Seop Jung

To my family

ACKNOWLEDGMENTS

Above all, I thank my wife, who supported me throughout the entire process that led to this dissertation. Without her, I would not be Dr. Jung. Additionally, this project could not have been completed without the guidance and help of Dr. Debbie Treise. She provides the perfect blend of criticism and encouragement, revision and hope. Moreover, I want to thank my committee members—Dr. Mike Weigold, Dr. Robin Goodman, and Dr. Virginia Dodd—for providing feedback and support throughout this process.

TABLE OF CONTENTS

	<u>page</u>
ACKNOWLEDGMENTS	4
LIST OF TABLES	7
LIST OF FIGURES	8
ABSTRACT.....	9
CHAPTER	
1 INTRODUCTION	11
Direct-to-Consumer Advertising	11
Purpose of the Study	16
2 LITERATURE REVIEW	19
Effect of the Attitude Toward the Ad	21
Factors Affecting Attitude Toward the Ad.....	24
Ad Awareness and Ad Exposure	24
Demographic Factors.....	26
Health Status and Involvement.....	26
Other Factors Affecting Attitude Toward the Ad.....	28
Potential Moderating Variables	28
Sample	28
Type of Research	29
Measurement of Constructs	29
Theoretical Basis	30
Other Research Characteristics	30
Chapter Summary	31
3 METHOD	35
Meta-Analysis.....	35
Meta-Analysis Process.....	36
Step 1: Database Development.....	38
Step 2: The Conversion	40
Step 3: Method of Analysis	41
Rater Reliability.....	42
Fixed Versus Random Effect Models.....	43
File Drawer Problems	45
Chapter Summary	46

4	RESULTS	49
	Antecedents of Attitude Toward the Ad	50
	Attitude Toward the Ad and Outcomes	51
	Ad Awareness	53
	Other Relationships	54
	Moderator Analyses	56
5	DISCUSSION	67
	Discussions and Implications	68
	Role of Attitude Toward the Ad	68
	Role of Ad Awareness	73
	Role of Antecedents of Attitude Toward the Ad	74
	Limitations	76
	Chapter Summary	78
 APPENDIX		
A	CODED CHARACTERISTICS OF INCLUDED STUDIES	79
B	OTHER CHARACTERISTICS OF INCLUDED STUDIES	82
C	CODING MANUAL AND FORMS	88
	LIST OF REFERENCES	95
	BIOGRAPHICAL SKETCH	104

LIST OF TABLES

<u>Table</u>	<u>page</u>
1-1 Summary of DTCA Effects	18
2-1 Summary of Hypotheses	32
2-2 Summary of Research Questions	33
3-1 The Conversion Statistical Equations	48
3-2 Interrater Reliability for Coded Categories.....	48
3-3 Analysis of the File Drawer Problem.....	48
4-1 Analysis of the Relationships between Antecedents and A_{ad}	59
4-2 Analysis of the Relationships between A_{ad} and Intentions	59
4-3 Analysis of the Relationships between A_{ad} and Other Outcomes.....	60
4-4 Analysis of the Non-Hypothesized Relationships	61
4-5 Subgroup Means by Moderator Variables	63

LIST OF FIGURES

<u>Figure</u>		<u>page</u>
2-1	Suggested Model of DTCA Effects.....	34
4-1	Summary of the Results	58

Abstract of Dissertation Presented to the Graduate School
of the University of Florida in Partial Fulfillment of the
Requirements for the Degree of Doctor of Philosophy

ASSESSING THE RELATIONSHIP OF ATTITUDE TOWARD THE AD TO INTENTIONS
TO USE DIRECT-TO-CONSUMER DRUGS: A SYSTEMATIC QUANTITATIVE META-
ANALYSIS

By

Wan Seop Jung

August 2011

Chair: Debbie Treise
Major: Mass Communication

Attitude toward the ad (A_{ad}) is widely known to be an essential predictor of behavioral intentions. Therefore, a number of studies have addressed A_{ad} in the DTCA literature. Despite this interest in A_{ad} , there has not been a comprehensive attempt to investigate general findings across independent DTCA studies. Such an investigation is useful in understanding the general strength and variability of the relationships and the study conditions that moderate those relationships. For example, while some studies have reported no evidence of a significant effect of A_{ad} on behavioral intentions, others have reported a significant effect. Furthermore, different studies have found widely varying magnitudes of the A_{ad} effect on behavioral intentions. In order to assess the strength and variability of the A_{ad} -intention relationship, the current research meta-analyzed A_{ad} effects aggregated across all available research in the extant DTCA literature. In addition to the assessment of the relationship between A_{ad} and intentions, this study also investigated the relationships between A_{ad} and its antecedents and the potential moderating variables. The results of this meta-analysis provide considerable insight into the effects of A_{ad} in the contexts of DTCA and the state of DTCA research.

As with any meta-analysis, the data provide a quantitative summary. In the current meta-analysis, the data provided a summary of 278 samples reported in the 36 articles for which the author could obtain usable data. Variables were classified into three levels. The first level included demographic characteristics, ad awareness, involvement, health status, and drug usage. The second level contained consumers' attitudes toward the ad. The third included behavioral intentions. The first level directly and/or indirectly affected the second and third. The second level directly influenced the third.

As shown in Tables 4-1 through 4-5 and analyzed above, the aggregated study effects suggested a significant relationship between A_{ad} and a number of important constructs, including both antecedents (education, $r = -.12$ and $Z_r = -.12$ and income, $r = -.08$, $Z_r = -.08$) and consequences (behavioral intention, $r = .19$ and $Z_r = .20$ and pharmacist intention, $r = .15$, $Z_r = .15$). In addition, the results also found that consumers' intentions were influenced by personal characteristics, including gender ($r = .02$ and $Z_r = .08$), health status ($r = -.12$ and $Z_r = -.12$), drug usage ($r = .14$ and $Z_r = .15$), and ad exposure ($r = .23$ and $Z_r = .24$). The results showed that consumers who (a) were less educated, (b) had a low income (c) were female, (d) were in bad health, (e) took a lot of drugs, or (f) were exposed to advertising frequently tended to have more favorable attitudes toward DTCA than those who (a) were more educated, (b) had a high income (c) were male, (d) were in good health, (e) took few drugs, or (f) were exposed to advertising less frequently. However, in general, the strength of each of these relationships was small or small to moderate.

CHAPTER 1 INTRODUCTION

Direct-to-Consumer Advertising

Direct-to-consumer prescription drug advertising (DTCA) is becoming increasingly common in the USA. DTCA refers to any promotional effort by a pharmaceutical firm to present prescription drug information to consumers via the mass media (Wilkes, Bell and Kravitz 2000). Due to the controversy surrounding DTCA, there are only two developed countries that permit it: the United States and New Zealand (Hoek and Gendall 2002). Among the controversial issues is that DTCA encourages the inappropriate use of medications and drives up drug spending (Donohue, Cevalco and Rosenthal 2007). While DTCA was a radical idea little less than 30 years ago, it has grown significantly over the last 3 decades and extended into a variety of health conditions.

In 1708, Boston's Nicholas Boone advertised the first patented medicine in an American newspaper (Young 1969), inspiring others to promote their patented medicines as well (Wilkes et al. 2000). For the next 200 years, patented drugs such as Pectoral Drops, Balsam of Life, and Cordial appeared in newspapers, magazines, and medicine shows. By the early 1800s, the pharmaceutical industry and the press had developed a mutually beneficial relationship. For example, newspapers received the biggest proportion of their income from drug advertising, and the drug industry spent more to promote their products than other industries.

With the enactment of the Federal Food, Drug, and Cosmetic Act in 1938, the US Food and Drug Administration (FDA) was given the authority to oversee the safety of food, drugs (both prescription and over-the-counter), and cosmetics. However, the Federal Trade Commission (FTC) still had the authority to control drug advertising and medical devices. In 1962, the Kefauver Harris Amendment, also known as the Drug Efficacy Amendment,

introduced requirements for pharmaceutical advertising to include, for example, information about the effectiveness, safety, and side effects of drugs, the size of warning/side effect statements (e.g., font size) and the benefits and risks of taking the drugs (Peltzman 1973). Furthermore, the Kefauver Harris Amendment transferred responsibility for prescription drug advertising from the FTC (which still had the authority to regulate advertising for over-the-counter drugs) to the FDA (Calfee 2002).

Even though the legal groundwork for drug advertising was laid in 1962, there is no specific point in time when the pharmaceutical industry began to open it to patients/consumers. However, of particular importance, during the late 1960s and early 1970s the FDA utilized the patient package insert (PPI). PPIs, first developed in 1968, ultimately led to DTCA (Pines 1999). The first PPI was designed to promote isoproterenol inhalation products (Federal Register 1968). Then the concept of the PPI was extended to birth control pills and estrogen replacement therapy. To provide medical information to patients, during the 1970s, the FDA increasingly and consistently required information about prescription medicine to be provided directly to consumers (Federal Register 1979).

Until 1981, the pharmaceutical industry had promoted drugs and medical equipment exclusively to physicians and other health care professionals because only physicians are responsible for the diagnosis of patients' health conditions, and have the authority to prescribe drugs (Weissman, Blumenthal, Silk, Zapert, Newman and Leitman 2003). In addition, pharmaceutical marketers believed that promoting drugs directly to consumers would be suicidal due to the fear that physicians would never prescribe drugs that bypassed them. Thus, promoting prescription drugs to non-medical-professionals was inconceivable. Before DTCA was implemented, health care decisions were dominated by physicians because they monopolized the

medical/medicine information. The traditional pharmaceutical marketing program consisted of: (a) advertising in medical journals; (b) educating physicians about the pharmaceutical firm's latest offerings; and (c) the provision to doctors by mail of drug information.

In the late 1970s and early 1980s, as the perception that consumers had the right to know about drug information for better medical services emerged, pharmaceutical companies sought to promote their products directly to consumers. As part of this trend, a book about prescription drugs - the *Physician's Desk Reference* (PDR) - became available in consumer bookstores. The PDR was written exclusively for physicians and health care professionals, and from it, consumers were able to gain access to drug information and learn about the effects of drugs.

The breakthrough of implementing drug advertising came from British-based Boots Pharmaceuticals, which advertised its ibuprofen product, Rufen. A second DTCA was undertaken by Merck Sharp & Dohme, which advertised its pneumonia vaccine, Pneumovax in *Reader's Digest* in 1981. The advertisements for Rufen and Pneumovax raised questions in terms of the potential negative effects of DTCA. For example, physicians at the FDA believed that even though there was a public health benefit in advertising a prescription drug, DTCA could provide incorrect information regarding drug uses (Hoen 1998).

In 1982, the-FDA Commissioner Arthur Hull Hayes, Jr. spoke to the Pharmaceutical Advertising Council, summarizing the status of DTCA as the FDA saw it and predicting exponential growth in DTCA. Even though the Commissioner did not intend to advocate for DTCA, the pharmaceutical companies interpreted the speech as the FDA's approval of DTCA, and they began to advertise their products directly to consumers. In September of 1982, the FDA officially requested that the pharmaceutical industry voluntarily avoid advertising its products directly to consumers, and the industry halted the promotion of its products.

Over the next two years, the industry and the FDA investigated the impact of DTCA on consumers, which is considered the early research on DTCA. During the investigation period, only price comparison advertisements were allowed. There were two noteworthy studies that significantly influenced the FDA's thinking about DTCA. One study found that consumers tended to acquire more information about the positive aspects of products than about the negative aspects (Morris and Millstein 1984). Another study showed that consumers preferred prescription drug information in detail and would consider DTCA favorably (Morris, Brinberg, Klimberg, Rivers and Millstein 1986).

The studies of Morris and Millstein (1984) and Morris et al (1986) indicated that the FDA had opened the door for the pharmaceutical industry. However, the FDA felt that DTCA should be controlled and the pharmaceutical industry needed specific guidance regarding DTCA. On September 9, 1985, the FDA announced guidelines stipulating that DTCAs should be fairly balanced in terms of benefit and risk information (Calfee 2002). Subsequently, pharmaceutical companies began to more broadly promote their products directly to consumers in print in accordance with the FDA's guidelines. Although the FDA did not restrict broadcast DTCA, the industry could not utilize television to promote its products because it was impossible to meet the legal criteria (e.g., a detailed "brief summary" of risks, a lengthy "major statement" of risks, and "adequate provision" for consumers to acquire full FDA-approved prescription information) (Calfee 2002). Specifically, prescription drug marketers were unable to provide all of the risk information to patients in a limited amount of time. Nevertheless, DTCA consistently increased from \$12 million in 1989 to \$55 million in 1991, \$164 million in 1993, \$340 million in 1995, and almost \$ 1 billion in 1997 (Wilke 1997a; Wilke 1997b). The number of drugs that utilized

DTCA gradually increased from six in both 1994 and 1995, to nine in 1996, and fourteen in 1997 (Pines 1999).

The pharmaceutical industry reached a turning point in the late 1990s. In January of 1997, then-Commissioner Dr. David A. Kessler left the FDA. Since he had opposed television advertising of prescription drugs, his departure from the FDA provided momentum for a new television advertising policy. In August of 1997, the FDA issued the “Draft Guidance for Industry on Consumer-directed Broadcast Advertisements,” which removed obstacles for television drug advertising (FDA 1997). The “Draft Guidance” indicated the ways in which the “adequate provision” could be met: (a) a toll-free number to call for more information; (b) concurrent print advertisements containing a brief summary of the risks; (c) Web address where more information about the drug would be available; or (d) specific drug information that could be obtained from publicly accessible locations such as hospitals or pharmacies (FDA 1997).

During the next two years, the FDA reviewed the policy and further investigated the effects of DTCA on patients, and in August of 1999, the FDA (1999) issued its last guidance on DTCA. Since the FDA had allowed advertising for prescription drugs to be broadcast directly to consumers in 1997, the amount of DTCA for prescription drugs as well as the research on DTCA increased rapidly (An 2008; Jung, Kim and Rhee, 2010). For example, in 1996, total spending on DTCA in the United States was approximately \$1 billion, but that amount increased to \$4 billion in 2005 (Brett 2007) and \$4.3 billion in 2009 (Kaiser Family Foundation 2010). This rate of increase in DTCA spending was nearly 330% from 1996 to 2005, and its average rate of growth was 14.3% from 2002 to 2005 (Donohue, Cevasco and Rosenthal, 2007). And, advertising of prescription drugs (DTCA) represents 60% of the total spending on drug advertising (General Accounting Office 2002).

Purpose of the Study

The dramatic growth of DTCA spending has accompanied a great deal of studies dealing with various aspects of DTCA since the early-1980s. These aspects include the following: policy and regulation of DTCA (e.g., Calfee 2002; Sheehan 2003; Hoek and Gendall 2002), media environment (e.g., Brownfield, Bernhardt, Phan, Williams and Parker 2004), consumer behavior (e.g., Deshpande, Menon, Perri III and Zinkhan 2004; Yuan 2008; Hausman 2008), physicians' attitudes toward DTCA (e.g., Paul, Handlin and Stanton 2002), economic impact of DTCA (Kopp and Sheffet 1997) and advertising content (e.g., Kaphingst, Dejong, Rudd and Daltroy, 2004). Among other DTCA topics, the most controversial and most frequently researched issue in the DTCA literature is the effects of DTCA, especially with respect to the outcomes we can expect via DTCA and some constructs that affect the effects of DTCA. Table 1-1 displays the summary of the literature on DTCA effects.

Despite the large volume of research in the area of DTCA, the findings in terms of ad effects have been inconsistent. For example, while some studies have reported no evidence of a significant effect of DTCA on consumer behavior (e.g., Williams and Hensel 1995), others have reported a significant effect (e.g., An 2007). Furthermore, different studies have found widely varying magnitudes of DTCA effect on consumer behavior. This suggests that DTCA research should first develop an understanding of the nature of the underlying relationship between advertising outcomes and antecedents such as A_{ad} in order to determine whether the patterns of these relationships are consistent or inconsistent across other independent studies. Furthermore, there should be an attempt to systematically review DTCA-related research.

To understand thoroughly what previous research has revealed regarding the role of DTCA, both qualitative and quantitative research can be used. However, a qualitative review is problematic in that it can neither account for the quality of the study nor for the issues of the

effect size of each study (Capella 2005). Thus, a meta-analysis that statistically cumulates empirical findings is a better method of reviewing the research results. The current research employs a meta-analytic methodology using quantitative statistical results from the DTCA literature obtained since the publication of the FDA's initial DTCA study in 1982.

Given the amount of speculation concerning the role of A_{ad} and the amount of research that has been devoted to the topic, it is useful to consider what is known about the concept and to identify the most fruitful avenues for future research. Accordingly, the present study aims to address several issues. First, it examines studies on the antecedents of A_{ad} in DTCA (e.g., gender, age, ethnicity, media exposure, health status / involvement, ad awareness). Second, it examines studies on the consequences of A_{ad} in DTCA (e.g., intention to ask doctors to prescribe the advertised drug, intention to find more information regarding the advertised drug, intention to visit a doctor's office). Third, it considers theoretical developments related to A_{ad} . Fourth, the study examines the potential variables that moderate the relationships between A_{ad} and its antecedents and consequences. Finally, it offers suggestions for future research.

Table 1-1. Summary of DTCA Effects

1. DTCA Effects on Patients	Relevant Literature
a. intentions to request that physicians prescribe the advertised drug	An 2007; Mehta and Pruvit 2003; Hausman 2008
b. intentions to ask physicians for more information about the advertised drug	An 2007; Herzenstein, Misra and Posavac 2005
c. intentions to search for information about the advertised drug	Herzenstein, Misra and Posavac 2005; Morris et al. 1986
d. intentions to discuss symptoms with physicians	Miller and Blum, 1993; Yuan 2008
e. advertising recall	Baca et al. 2005
f. attitude toward the brand	Hausman 2008
g. attitude toward the DTCA regulations/policies	Huh et al. 2004
2. DTCA Effects on Physicians	
a. physicians' attitudes toward DTCA	Paul et al. 2002; Petroschius, Titus and Hatch, 1995
b. drug prescription writing	Bell, Wilkes and Kravitz 1999; Wilkes et al. 2000
c. education	Myers et al. 2006
3. DTCA Effects on Physician-Patient Relationship	
a. horizontal relationship	Berger et al. 2001
b. lengthened clinical encounter	Lipsky and Taylor 1997, Robinson et al. 2004
4. DTCA Effects on the Pharmaceutical Industry	
a. market-expansion	Iizuka 2004

CHAPTER 2 LITERATURE REVIEW

The pharmaceutical industry is one of the most advertising-intensive industries (Brekke and Kuhn 2006). However, advertising pharmaceutical products has generated a controversial debate since its inception. For example, DTCA proponents claim there is an educational value to DTCA and contend that DTCA increases the consumer's knowledge and awareness regarding available medical treatment options. Advocates also assert that DTCA may enable patients to notice a disease in the early stages. By contrast, opponents argue that DTCA encourages inappropriate use of medications and drives up drug spending and price. Since most DTCA fails to inform consumers of the potential (side) effects of drug mis- and over-use or to provide directions for adequate usage, it can be considered as dissemination of improper information about the potential and foreseeable risks connected to prescription drugs; it also overstates the efficacy of the advertised drugs (Lee, Salmon and Paek 2007). Opponents are also concerned about whether FDA guidelines for DTCA are strict enough to ensure that consumers are informed about all relevant drug information. Ironically, such criticism is evidence that DTCA has a significant effect on consumer and physician behavior. Furthermore, more and more empirical evidence has been collected of the effect that DTCA has on consumer knowledge, awareness, and attitudes toward DTCA, as well as behavior related to health care treatment. The significant effect of DTCA has led many researchers to contribute to the debate surrounding DTCA.

A number of empirical studies have addressed various aspects of DTCA. Much of the previous research has focused on governmental regulation and policy (e.g., Green 1995; Reichertz 1996; Statman and Tyebjee 1984), DTCA industry and management issues (e.g., Leffler 1981; Rheinstein 1982), or DTCA effects (e.g., Alperstein and Peyrot 1993), prior to

1997 when the FDA allowed pharmaceutical companies to advertise prescription drugs on television (Jung, Kim and Rhee 2010). In addition, questions related to what DTCA does or what its effects are have often been investigated in extant DTCA literature. As DTCA is a common phenomenon, greater attention has been paid to identifying the variables that predict the desired behavioral outcomes, which is the ultimate goal of the marketing efforts for pharmaceutical products.

As a result of prior research on DTCA, some variables have been identified that anticipate the likelihood of such behavior in the context of DTCA, such as A_{ad} (e.g., Mehta and Purvis 2003). Not surprisingly, A_{ad} is the most frequently employed variable in DTCA-related research to predict consumer behaviors (Wilson and Till 2007) because A_{ad} is considered the best indicator of advertising effectiveness (Haley and Baldinger 1991). Despite its importance, there has not been a comprehensive attempt to evaluate the general findings across independent studies. Moreover, several research findings on the relationship between A_{ad} and its outcome variables vary in terms of the strength and direction of the relationships. Therefore, evaluating the general findings across independent studies will be useful in understanding the general variability and strength of the relationships and the research conditions (e.g., methodological and research environment differences) that moderate those relationships. This is because A_{ad} related studies have been conducted in various methodological contexts, but there has been no attempt to assess the robustness of A_{ad} effects across different methodological conditions (Rao and Monroe 1989). The current study begins with a review of the literature regarding A_{ad} in the context of DTCA and then a review of the preceding variables and outcome variables and other moderators, using a meta-analysis technique. The results of this study help determine the strength and direction of

relationships between A_{ad} , the preceding variables, and the outcome variables. Figure 1, Table 2-1 and 2-2 provide a summary of the hypotheses and research questions.

Effect of the Attitude toward the Ad

The concept of attitude toward the ad (A_{ad}) has been subject to a great deal of empirical study in the context of DTCA, both as an antecedent and a consequence of other advertising-related variables of interests. In spite of the importance of A_{ad} , no one has comprehensively and systematically attempted to assess the empirical findings across other independent studies related to DTCA and A_{ad} . As other researchers have emphasized meta-analysis, “the primary questions of interest in a meta-analysis concern the robustness of the relationships studied and the specification of conditions that limit these relationships’ generalizability” (Brown and Stayman 1992, p. 35). This study is the first to review and analyze previous DTCA-related research findings in terms of the relationships between consumers’ (or patients’) A_{ad} and its antecedents and consequences. In the current study, the variability and strength of the relationship between A_{ad} and its antecedent and outcome constructs will be investigated using a meta-analysis technique.

To understand the relationship between A_{ad} and advertising effects, it is necessary to explore the concept of attitude and identify the roles of attitude in general. The concept of attitude has played a critical role in the fields of psychology and education to understand human thought and behavior. Since 1974, more than 34,000 published studies have addressed attitudes in some way (Kraus 1995). The roles of attitude that researchers have identified are that they, in some way, influence, direct, guide, or predict actual behavior, and researchers have taken much interest in this attitude-behavior relationship.

In the fields of advertising and marketing, researchers have applied the concept of attitude to advertising, created the concept of attitude toward the ad (A_{ad}), and tested whether the

role of A_{ad} is similar to attitude in general. A_{ad} , one of the most important constructs in advertising research, refers to “an affective construct representing consumers’ feelings of favorability/unfavorability toward the ad itself” (MacKenzie, Lutz and Belch 1986 p. 130). The general importance and construct of A_{ad} was introduced by Shimp (1981), who viewed A_{ad} as an important mediator of brand choice (also see Mitchell and Olson 1981). Furthermore, a great deal of advertising research has investigated the roles of A_{ad} in determining advertising outcomes, because brand attitudes and behavioral intentions are functions of A_{ad} in general (e.g., MacKenzie et al. 1986; MacKenzie and Lutz 1989). Shimp (1981) proposed the Three Alternatives Brand Choice Mechanisms, suggesting attitude-transfer from advertising to brand which culminates in brand choice. MacKenzie et al. (1986) also proposed the Four Alternative Structural Specifications of the mediating role of A_{ad} that are causal models derived from A_{ad} research as a mediator: affect transfer model, dual mediating model, reciprocal mediation model, and independent influences model. Although there are several models to explain the role of A_{ad} , they have something in common in that A_{ad} is viewed as an affective construct and an influence on intentions (Homer 1990).

DTCA researchers have incorporated the concept of A_{ad} in terms of how A_{ad} affects consumers’ intentions. A substantial body of empirical research supports the relationship between A_{ad} and intentions. However, in the context of DTCA, it should be noted that consumers’ intentions cannot be operationalized as actual purchases or purchase intentions because it is impossible that a consumer will purchase certain drugs without a prescription. Instead of measuring purchase intentions directly, DTCA research to date has investigated various types of behavioral intentions as outcomes of A_{ad} , such as intentions to request that physicians prescribe the advertised drug (e.g., An 2007; Mehta and Purvis 2003; Hausman 2008),

intentions to ask physicians for more information about the advertised drug (e.g., An 2007; Herzenstein, Misra and Posavac 2005), intentions to discuss symptoms with physicians (e.g., Miller and Blum 1993; Yuan 2008), and intentions to visit their physicians (e.g., Gonul, Cater and Wind 2000). In addition to the effects of A_{ad} on intentions, another marketing variable, brand attitudes, was investigated as well (e.g., Hausman 2008).

In sum, the earlier foundational theoretical models in ad attitude research would lead one to assume that consumers' behavioral intentions could be reflective of their attitudes toward advertising, as well as attitudes toward certain branded products. In other words, it could be argued that if consumers have positive attitudes toward DTCA, they are more likely to adopt the specific advertised brand and vice versa. Based on the majority of past research and attitude/ A_{ad} -brand attitude-behavior models, it is hypothesized that A_{ad} is a significant predictor of behavioral intentions and attitude toward the brand in the context of DTCA. Accordingly, H_1 and H_2 are used to demonstrate this relationship in the model from Figure 2-1.

H_1 : In extant DTCA literature, attitude toward the ad is positively related to behavioral intentions (e.g. drug request intention, drug inquiry intention, drug information search intention, and physician visit intention).

H_2 : In extant DTCA literature, attitude toward the ad is positively related to attitude toward the brand.

Factors Affecting Attitude toward the Ad

The previous section reviewed the effects of A_{ad} on behavioral intentions in the context of DTCA. The extant literature on A_{ad} posits that advertising may influence consumer behavior by influencing the consumers' attitudes toward the ad. The question that naturally arises is "What determines A_{ad} ?" The results of hypotheses and research questions will be useful for pharmaceutical marketers to develop market segmentation strategies. For example, several

studies investigated the relationships among demographic characteristics, A_{ad} , and behavior. Pharmaceutical marketers can use the findings of those studies to decide on the target audiences that are suited to their marketing purposes. In the next section, the literature on the factors affecting A_{ad} will be reviewed.

Ad Awareness and Ad Exposure

The effect of ad awareness on A_{ad} and other outcomes can be explained by early experimental research on the “mere exposure effect,” referring to the idea that the repetition of ads leads individuals to give a more positive evaluation of an advertised product/brand and an advertisement itself (Tellis 1988). Research on the mere exposure effect has emphasized the power of familiarity (i.e., exposure to advertisements increases familiarity with them). Zajonc (1980) argues that familiar objects tend to be preferred over unfamiliar ones. A number of researchers have found support for the familiarity effect such that familiar brands/ads were more likely to produce favorable attitudes toward the ad / brand than unfamiliar ads / brands (Campbell and Keller 2003; Dahlen 2001; Janiszewski 1993; Pechmann and Stewart 1990). An interesting finding in the literature of mere exposure effect is that mere exposure even to nonsense photos or words generates positive attitudes (Zajonc 1980). Using the elaboration likelihood model, Petty and Cacioppo (1979) also insist that consumers in some situations are often reliant upon simple heuristics (e.g., brand familiarity) when making purchase decisions, and it is well known that there is a high multicollinearity between ad exposure and ad awareness. Therefore, it is hypothesized that ad awareness and ad exposure are predictors of A_{ad} in the context of DTCA.

Several studies have addressed various preceding variables of ad awareness such as medication condition, drug use, gender and age (e.g., Perri and Nelson 1987; Bell et al. 1999;

Huh and Becker 2005). Those studies found that higher levels of ad awareness were related to older people, regular drug users, females, and those who are concerned about their health. However, other studies revealed somewhat different findings (e.g., Alperstein and Peyrot 1993). For instance, they found that young people are more aware of the advertised drugs. In addition to the problem of inconsistent results regarding the preceding variables of ad awareness, theoretical studies of ad awareness in the DTCA literature are scant. Thus, antecedents of ad awareness and their strength of the relationships will be investigated. As such, the relationships are depicted as H_3 and RQ_{1-a} and b in the model from Figure 2-1.

H_3 : Ad awareness and ad exposure are positively related to A_{ad} in extant DTCA literature.

RQ_{1-a} : Which preceding variables of ad awareness have been investigated in extant DTCA literature?

RQ_{1-b} : How strong are the relationships between the preceding variables and ad awareness in extant DTCA literature?

Demographic Factors

Demographic factors such as age, gender, and ethnicity have been investigated to determine whether they affect A_{ad} . For example, age has been tested in terms of its impact on the degree to which consumers have favorable/unfavorable attitudes toward DTCA. Several studies have tested the role of age and found that older consumers tend to have more favorable attitudes toward DTCA (Williams and Hensel 1995; Menon, Deshpande, Zinkhan and Perry 2004; Baca, Holguin and Stratemeyer 2005). Gender difference is one of the main research topics in the field of women's studies. Metha and Purvis (2003) investigated the role of gender and found that women valued DTCA more than men. The impact of ethnicity has been examined in the context of DTCA as well (e.g., Huh and Becker 2004). In addition to the role of demographic factors as

preceding variables of A_{ad} , some studies (e.g., Peyrot et al. 1998) have argued that demographic factors bypass A_{ad} and directly affect consumer behavior.

Although the relationships between A_{ad} and demographic factors have been examined in several studies, little is known about the effects of demographic factors on A_{ad} and behavior. This is because most researchers have included demographic variables in DTCA studies more as descriptive statistics than as explanatory variables. That is, there has been relatively little theoretical work aimed at explaining why demographic variables should be related to A_{ad} in the DTCA literature. To find the common patterns of the relationships among demographic factors and A_{ad} , the present study investigates the effect sizes of each study regarding the relationships. These relationships are shown as RQ_2 and RQ_3 in the model from Figure 2-1.

RQ_2 : In extant literature how strong is the relationship between demographic factors (e.g., age, gender, and ethnicity) and A_{ad} ?

RQ_3 : In extant DTCA literature how strong is the relationship between demographic factors and intentions to request the advertised drugs, intentions to ask for more information about the advertised drugs, intentions to search more information, and intentions to visit physicians?

Health Status and Involvement

If consumers are concerned about their health, they may process arguments in DTCA carefully because they are highly involved with the ad arguments. According to Petty and Cacioppo's (1986) elaboration likelihood model (ELM), an individual's involvement level determines his or her use of either the central route or the peripheral route. Involvement is conceptualized as the consumer's overall subjective feeling of personal relevance (Celsi and Olson 1988). The ELM consists of a central route and a peripheral route. The central route is

characterized by considerable cognitive elaboration. This occurs when individuals focus in depth on the central features of an issue, person, or message. When people process information centrally, they carefully evaluate message arguments, ponder the implications of the communicator's ideas, and relate information to their own knowledge and values. However, the peripheral route is entirely different. Rather than examining issue-relevant arguments, people examine the message quickly or focus on simple cues to help them decide whether to accept the argument. The simple cues can include a communicator's physical attractiveness or speaking / writing style or a pleasant association between the message and the music playing in the background. The ELM posits that under high-involvement conditions, people use a central route to process information, whereas under low-involvement conditions, they use a peripheral route to process information. Based on the ELM, it is hypothesized that a consumer's health condition and involvement with a medical condition are significant predictors of A_{ad} in the context of DTCA. In addition, it will be examined whether the health status factor directly affects consumer behavior. Accordingly, H_4 and RQ_4 are used to demonstrate this relationship in the model from Figure 2-1.

H₄: In extant DTCA literature, the consumer's health status and involvement with medical conditions are related to the consumer's A_{ad} ; specifically, consumers who have (perceived) adverse health conditions and who are highly involved with a medical condition, have more favorable attitudes toward the ad than are consumers with good health conditions and low involvement.

RQ₄: In extant DTCA literature, how strong is the relationship between the health status and intentions to request the advertised drugs, intentions to ask for more information about the advertised drugs, intentions to search more information, and intentions to visit physicians?

Other Factors Affecting Attitude toward the Ad

Other factors, such as education and income, have rarely been examined to determine whether they influence A_{ad} or behavior in the context of DTCA. The current study will attempt to explore other factors affecting A_{ad} or behavior.

RQ₅: Which preceding variables of A_{ad} or behavior -besides demographic factors, health status/involvement, and ad exposure- have been investigated in extant DTCA literature?

RQ₆: How strong are the relationships between the preceding variables and A_{ad} or behavior in extant DTCA literature?

Potential Moderating Variables

As noted before, the primary purposes of a meta-analytic study are to assess the strength of the relationships and specific conditions that limit the generalizability of these relationships. The current study assesses the robustness of the relationships between A_{ad} and its preceding and outcome variables in extant DTCA literature. However, in terms of research methods and environments, this particular research stream encompasses diverse studies. This suggests that the methodological decisions might influence the robustness of pairwise relationships. Many meta-analysis researchers have provided useful guidelines on how to code study characteristics for moderator analyses (e.g., Hedges and Olkin 1985; Rosenthal 1984). As is typical in meta-analytic studies, research characteristics will be investigated as to whether they moderate the advertising effects in extant DTCA literature. Coding for the research characteristics will include

the following: (a) type of sample, (b) type of research methodology, (c) measurement of constructs, and (d) theoretical basis (if any).

Sample

The use of student samples has been a subject of debate in quantitative research (Calder, Phillips, & Tybout, 1981). The type of study subject (student or not) often functions as a moderator because the homogeneity of the student sample may produce strong bias effects that are not typically found in the general population and which culminate in a bias toward stronger effects.

H₅: The type of sample moderates the strength of pairwise relationships studied in extant DTCA literature; specifically, a stronger relationship is more likely to be detected by student samples than by non-student samples.

Type of Research

Due to the vulnerability of the use of student sample and the reliability issues of measuring instruments, the survey method tends to be more variable across independent studies with regard to research findings as compared to the experiment method.

H₆: The type of research moderates the strength of pairwise relationships studied in extant DTCA literature; specifically, a stronger relationship is more likely to be detected by survey studies than by experimental studies.

Measurement of Constructs

To measure A_{ad} , ad awareness, and intentions, some studies have used multi-item scales, whereas others have used a one-item scale. The analysis of the number of scale items has been suggested in a meta-analytic method because multi-item scales tend to be more reliable and

sensitive in general. The current study expects that multi-item scales may lead to greater effect sizes due to less attenuation from measurement error (Johnson and Eagly 1989).

H7: The number of scale items (one-item scale vs. multi-scale item) moderates the strength of pairwise relationships studied in extant DTCA literature; specifically, a stronger relationship is more likely to be detected by studies using multi-item scales than by studies using one-item scales.

Theoretical Basis

According to Farley and Lehman (1986), theory-driven studies tend not to have spurious effects. Therefore, it is necessary to examine the theoretical foundations of each independent study to analyze the study quality.

H8: The theoretical foundation moderates the strength of pairwise relationships studied in extant DTCA literature; specifically, a stronger relationship is more likely to be detected by theory-driven studies than by non-theory-driven studies.

Other Research Characteristics

In addition to the research characteristics addressed above, other characteristics will be investigated to determine whether they moderate the strength of pairwise relationships studied in the context of DTCA.

RQ7: Which research characteristics moderate the strength of pairwise relationships studied in extant DTCA literature?

To assess the impact of each research characteristic on the strength of pairwise relationships, the studies will be separated into two subsets. An overall and a subset mean effect size will be calculated for each characteristic.

Chapter Summary

The chapter 2 literature review provided an overview of the background knowledge and critical information regarding the research constructs (A_{ad} , antecedents, and consequences) of the current study. A theoretical background for the A_{ad} -outcome relationships was presented first with MacKensie et al.'s model (1986). Then a discussion of the theoretical and empirical background of A_{ad} -antecedents relations followed.

From the literature on DTCA, this study tests the strength of the relationships between A_{ad} and (a) the intention to ask doctors to provide more information about the advertised drug, (b) intention to ask doctors to prescribe the advertised drug, (c) intention to consult doctors to discuss their symptoms, (d) intention to visit physicians, and (e) attitude toward the brand. The DTCA literature suggests that a variety of factors have an impact on A_{ad} . This study also investigates the strength of the relationship between A_{ad} and 1) demographic variables (age, gender, and ethnicity), 2) health status/involvement, 3) ad exposure/media consumption, 4) ad awareness and 4) other potential preceding variables. Some studies (e.g., Peyrot et al. 1998) have argued that preceding variables such as demographic factors, health status/involvement, media exposure, and ad awareness bypass A_{ad} , and directly affect behavioral intentions. The current study analyzes the strength of the relationships between preceding variables and outcome variables (e.g., intentions).

The overview of the literature review led to the development of the hypotheses and research questions. This study reports the findings in two sections. First, it reports the results for consistencies and the strength of the relationships with A_{ad} . If the results are consistent, moderators do not exist, and if they are inconsistent, moderators exist. Second, moderator analyses are conducted, and the study reports the results of the analyses.

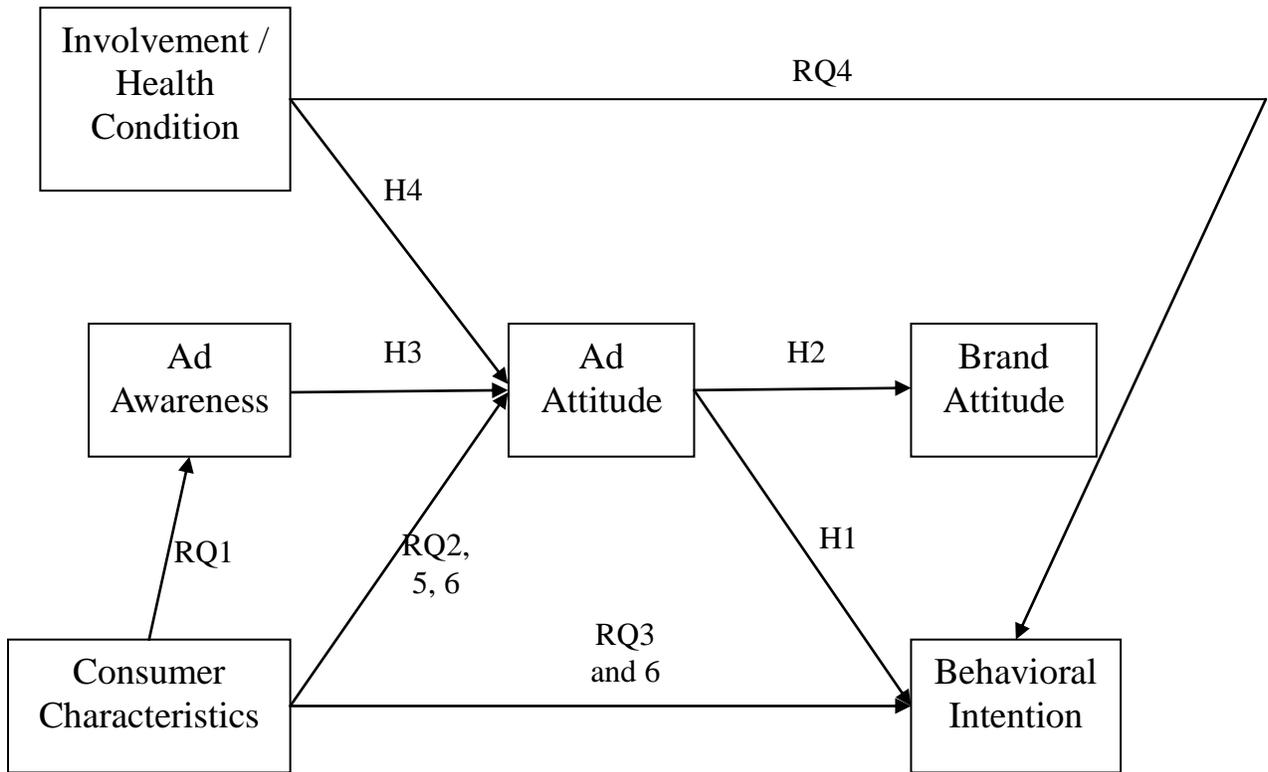
Table 2-1. Summary of Hypotheses

Hypotheses
<i>H₁: In extant DTCA literature, attitude toward the ad is positively related to behavioral intentions (e.g. drug request intention, drug inquiry intention, drug information search intention, and physician visit intention).</i>
<i>H₂: In extant DTCA literature, attitude toward the ad is positively related to attitude toward the brand.</i>
<i>H₃: Ad awareness and ad exposure are positively related to A_{ad} in extant DTCA literature.</i>
<i>H₄: In extant DTCA literature, the consumer's health status and involvement with medical conditions are related to the consumer's A_{ad}; specifically, consumers who have (perceived) adverse health conditions and who are highly involved with a medical</i>
<i>H₅: The type of sample moderates the strength of pairwise relationships studied in extant DTCA literature; specifically, a stronger relationship is more likely to be detected by student samples than by non-student samples.</i>
<i>H₆: The type of research moderates the strength of pairwise relationships studied in extant DTCA literature; specifically, a stronger relationship is more likely to be detected by survey studies than by experimental studies.</i>
<i>H₇: The number of scale items (one-item scale vs. multi-scale item) moderates the strength of pairwise relationships studied in extant DTCA literature; specifically, a stronger relationship is more likely to be detected by studies using multi-item scales than by studies using one-item scales.</i>
<i>H₈: The theoretical foundation moderates the strength of pairwise relationships studied in extant DTCA literature; specifically, a stronger relationship is more likely to be detected by theory-driven studies than by non-theory-driven studies.</i>

Table 2-2. Summary of Research Questions

Research Questions
<i>RQ_{1-a}: Which preceding variables of ad awareness have been investigated in extant DTCA literature?</i>
<i>RQ_{1-b}: How strong are the relationships between the preceding variables and ad awareness in extant DTCA literature?</i>
<i>RQ₂: In extant literature how strong is the relationship between demographic factors (e.g., age, gender, and ethnicity) and A_{ad}?</i>
<i>RQ₃: In extant DTCA literature how strong is the relationship between demographic factors and intentions to request the advertised drugs, intentions to ask for more information about the advertised drugs, intentions to search more information, and intentions to visit physicians?</i>
<i>RQ₄: In extant DTCA literature, how strong is the relationship between the health status and intentions to request the advertised drugs, intentions to ask for more information about the advertised drugs, intentions to search more information, and intentions to visit physicians?</i>
<i>RQ₅: Which preceding variables of A_{ad} or behavior -besides demographic factors, health status/involvement, and ad exposure- have been investigated in extant DTCA literature?</i>
<i>RQ₆: How strong are the relationships between the preceding variables and A_{ad} or behavior in extant DTCA literature?</i>
<i>RQ₇: Which research characteristics moderate the strength of pairwise relationships studied in extant DTCA literature?</i>

Figure 2-1. Hypothesized Model of DTCA Effects



Coded Study Characteristics: Sample (H₅), Type of Research (H₆), Measurement of Constructs (H₇), Theoretical Basis (H₈), Other Research Characteristics (RQ₇)

CHAPTER 3 METHOD

Meta-Analysis

Many researchers (e.g., Glass 1977; Rosenthal 1984) have argued that research activities in the social sciences, including mass communication are in crisis. While the natural sciences are based on standardized and commonly accepted techniques and methods, this is not the case in the social sciences. Explaining and understanding human behavior is a very difficult task due to its complexity, research environments are difficult to control, and sampling characteristics, methods, and techniques differ across studies (Wolf 1986). For example, many studies have examined advertising effects in the context of DTCA. These studies not only use different definitions, variables, procedures, methods, samples, and so on, but their conclusions are often at odds with each other.

It is possible that research environments in the social sciences lead to an enormous waste of scholarly effort (Kulik 1983) because those scholarly efforts cannot be cumulated. If we view science as the accumulation of information and knowledge (Hunter et al. 1982), to be considered a science, it is important to cumulate previous studies. It then becomes critical to establish guidelines for reliable and valid reviews, integrations, and syntheses of studies examining similar research questions (Jackson 1980). The principles of meta-analysis provide the guidelines for cumulating previous studies.

In addition to the environmental problems of the social sciences, there is an important perspective to adopt when reviewing previous literature. According to Kirk (2001), social scientists are interested in answering three basic questions when examining the relationships/differences between variables/groups: (a) statistical significance, (b) effect size, and (c) practical significance. A statistically significant outcome indicates the likelihood that there is

a real relationship between variables. In other words, the level of significance (p -value) indicates the probability that an outcome could happen. However, a very small p -value does not imply an important finding in any practical sense. If the sample size is very large, a small p -value can occur even though the difference between groups is small. In this case, the difference may not be significant in practical terms. The use of an effect size is a good way to overcome the limitation of the statistical significance test.

Meta-analysis is the principal method that I will use for my dissertation because the main purpose of my dissertation is to review previous research on direct-to-consumer advertising of prescription drugs. To thoroughly understand what previous research has revealed, both qualitative and quantitative reviews can be used. However, a qualitative review, in counter-distinction to a meta-analysis, is problematic in that it cannot account for the quality of the study or for issues of effect size for each study. Therefore, a better method of summarizing research results is to conduct a meta-analysis, which statistically, or quantitatively, accumulates research findings because the procedures employed in meta-analysis permit quantitative reviews and syntheses of the research literature that addresses these issues. This cumulative view of previous research provides an opportunity to draw a big picture in a research enterprise. Meta-analysis techniques have been also used to test certain hypotheses regarding the concept of A_{ad} . In this fashion, meta-analysis is used not only as a summary device, but also as a hypothesis-testing technique.

Meta-Analysis Process

Meta-analytic studies are rapidly growing in social sciences, and they follow three steps: database creation, data conversion, and the analysis method.

The first step in meta-analytic research is to collect relevant studies and to extract information to build a database of research findings across independent studies related to a research topic. The focus is usually the bivariate relationships between the constructs of interest. According to Lipsey and Wilson (2001), there are several eligibility criteria for studies, that can be included in meta-analysis. Studies should have distinguishing features. Since meta-analysis is a technique for testing statistical results across independent research findings related to the same topic, any papers lacking an element of study interest should be eliminated. A meta-analytic review combines the research findings of studies to evaluate the magnitude and significance of diverse measures of effect sizes (Fern and Monroe 1996). To be meta-analyzed, a study should contain statistical information (e.g., t -, F -, p -value, chi-square, correlation coefficient) sufficient to calculate an effect size, because meta-analysis cannot be used to summarize qualitative studies such as theoretical papers. If a study lacks statistical information, the author can either calculate or estimate the required statistics using the information presented in the studies or contact the authors of the studies to obtain the missing statistical information. If neither way is available, these studies will be eliminated. Field (2001) stated, “In meta-analysis, the basic principle is to calculate effect sizes for individual studies, convert them to common metric, and then combine them to obtain in average effect size” (p. 162). The second step of meta-analytic research is to transform the collected statistical information into a standardized form, if needed. The third step in meta-analysis is to analyze the obtained statistical information. Saxton (2006) argued that the goal of meta-analysis is to test whether the obtained results from independent studies confirm/disconfirm the strength and direction of the relationship between variables. In other words, meta-analysis treats data from independent studies as a part of one study. Furthermore, the analysis of data from multiple studies is conducted by calculating effect sizes.

Step 1: Database Development

All extant literature on the effects of DTCA was reviewed and synthesized in this dissertation. For the purpose of this review and synthesis, the current study meta-analyzed the range of articles that deal with DTCA and appeared in U.S. and international journals from 1981, when Leffler's (1981) DTCA study appeared to issues current at the time when the present analysis was conducted (2011). Advertising is an applied field; thus both marketing and communication have contributed to advertising research. In addition to marketing and communication, other fields like medicine, medical science, and/or law have investigated the role that DTCA plays in each field because of its inter-disciplinary nature. Thus, this study analyzes DTCA-related papers for a wide variety of fields (e.g., advertising, marketing, communication, health communication, health care, and law).

Studies for inclusion in the review were identified through computerized searches using the following: (a) *Journal of American Medical Association & Archives (JAMA & Archives)*, (b) *Ebsco Source Premier*, (c) *PubMed Central*, (d) *Science Direct*, (e) *Springer Link*, (f) *JSTOR*, (g) *ProQuest*, (h) *Wiley InterScience*, (i) *Business Source Premier*, (j) *Academic Search Premier*, (k) *Social Sciences Citation Index*, and (l) *PSYCHLIT*. Additionally, Google Scholar was used to search articles using the following search terms: "direct to consumer advertising of prescription drugs," "DTC," "DTCA," "pharmaceutical advertising," "pharmaceutical promotion," "prescription drug advertising," "promotion of prescription drugs," "drug promotion," "advertising of prescription drugs," and "drug advertising." The search terms were based on the keywords that each author listed for his or her article. For example, Bell et al. (1999) used "prescription drugs" and "drug promotion" as keywords for their study. After looking into all search terms listed in the literature on DTCA, the above search terms were developed.

In addition to the computer search, a manual search was conducted in two fashions. First, after reading the selected articles, the reference lists of previous reviews of DTCA literature were also screened to ensure a complete review. Second, an article-by-article search of 21 academic journals was performed. The following journals were included for the search: *Journal of Medical Marketing*, *Journal of Clinical Oncology*, *Journal of Consumer Marketing*, *Journal of General Internal Medicine*, *Health Care Management Science*, *Journal of Advertising*, *International Journal of Advertising*, *Journal of Health Communication*, *Public Health Care Report*, *Health Marketing Quarterly*, *Journal of Advertising Research*, *Journal of Health Care Marketing*, *American Journal of Health Behavior*, *Journal of Business Ethics*, *Research in Social and Administrative Pharmacy*, *Journal of Health and Human Services Administration*, *Journal of Product & Brand Management*, *Annals of Family Medicine*, *Health Affairs*, *Health Communication*, and *Communication Research*. All referenced papers in these published articles were included in the study. The search process yielded 36 articles that presented empirical findings that could be used in the meta-analysis. No restrictions were placed on the inclusion of the studies other than that they must have analyzed DTCA effects. The studies included contained correlations between A_{ad} and a wide array of variables.

All relevant studies were coded into three separate databases: A_{ad} -its antecedents relationships, A_{ad} -its consequences relationships, and other relationships. The separate coding processes were based on the research agenda of the current study. First, this study hypothesized that A_{ad} is a significant predictor of intentions and brand attitude. Second, research questions were developed about the relationship between A_{ad} and its antecedents. Lastly, in addition to looking at A_{ad} -related pairwise relationships, the current study also examined at the relationships

between antecedents of A_{ad} and consequences of A_{ad} . For the purpose of analyzing data, the databases were conveniently divided into three main sections.

(1) *A_{ad} -its antecedents relationships*. The total sample size across independent studies was 51 reported correlation coefficients or other statistics that could be transformed into correlation coefficients. The correlations were collected from studies published in peer-reviewed journals between 1991 and 2009. These studies reported many preceding variables including age, gender, ethnicity, education, health status, involvement, ad exposure, ad awareness, drug usage, and income.

(2) *A_{ad} -its consequences relationships*. The total sample size across independent studies was 51 reported correlation coefficients or other statistics that could be transformed into correlation coefficients. The correlations were collected from studies published in peer-reviewed journals between 1995 and 2007. These studies reported a number of outcome variables including behavioral intentions.

(3) *Other relationships*. The total sample size across independent studies was 107 reported correlation coefficients or other statistics that could be transformed into correlation coefficients. The correlations were collected from studies published in peer-reviewed journals between 1986 and 2010. These studies reported not-hypothesized variables.

Step 2: The Conversion

The term effect size refers to the magnitude of effect observed in a study. The effect size can be represented in two ways: standardized mean difference (d) and correlation coefficient (r) (Hedges and Olkin 1981). The standardized mean-difference effect sizes (d) are devised to calculate the degree of difference between group means. In other words, it is often used extensively for expressing and combining the results of studies that assess the effectiveness of an

experimental treatment. The correlation coefficient effect sizes (r) are designed to calculate the size of a relationship between variables. In meta-analysis, an estimate of effect magnitude is obtained for each study. Individual effect magnitude estimates can then be averaged to obtain an overall estimate of effect magnitude.

Before conducting a meta-analytic study, a researcher must determine the effect size metric to use (e.g., d or r). Next, statistical information has to be converted into the common standardized form (e.g., d or r). The effect size used in the current research was the correlation coefficient (r), which is the square root of the variance explained by a given variable or combination of variables (Rosenthal 1994). The correlation coefficient was chosen as the measure of effect size because it is easy to compute from a t - or F -statistic and easy to interpret (Janiszewski, Noel and Sawyer 2003). This study utilized correlation coefficient values for data analyses. However, it is well known that correlation coefficients are not normally distributed. It is, therefore, conventional in meta-analysis to convert correlations to z scores using Fisher's r - to $-z$ transformation $Z_r = .5 [\ln (1 + r) - \ln (1 - r)]$, where $\ln(x)$ is the natural logarithm function. This study reports both r and z and assesses whether there is a difference between the two values.

In order to synthesize the empirical findings across independent studies, it was needed to convert all test statistical information to a standardized form, r . Moreover, statistical tests such as t -tests, F -tests, chi-square statistics, and p -value are not effect sizes because for any given effect, their value increases as the sample size increases (Rothstein, McDaniel and Borenstein 2002). Therefore, when necessary, the statistical information in primary studies was converted into the correlation coefficient effect size (Arthur, Jr., Bennett, Jr. and Huffcutt 2001). Examples of equations for transformation to r are illustrated in Table 3-1.

Step 3: Method of Analysis

A number of relationships pertinent to the hypotheses and research questions were examined. Once transformed into the common effect size metric (r), the individual effect sizes for independent studies can be synthesized to obtain an average or pooled effect size. To calculate the pooled effect size, the effect sizes are weighted by an individual study's sample size, where the results of studies that have large sample sizes receive more weight. To test the significance of the effect sizes, Ankem's (2005) suggestions can be used, and he stated, "upon calculation of the aggregated effect size, significance in meta-analysis is generally gauged by computing 95% confidence intervals around the average effect size" (p. 164). If the confidence interval does not include zero, the effect size is significant.

After combining the effect sizes, proposed Hunter and Schmidt (1990) moderator analyses are necessary. Moderator analyses are helpful to gain additional insight into the research pairwise relationships and to refine the strength/direction of the relationships. In the current study, moderator analyses were performed by categorizing the total sample into subgroups based on the following research characteristics: (a) type of sample, (b) type of research methodology, (c) measurement of construct, (d) theoretical basis (if any), and (e) other coding categories.

(1) Type of sample. The samples of each study will be coded in terms of student vs. non-student.

(2) Type of research. Meta-analysis cannot be used to summarize qualitative studies such as theoretical papers. First, to sort out meta-analyzable studies, research papers will be coded in terms of qualitative vs. quantitative. Second, quantitative studies will further be categorized into two methodologies: experiment and survey.

(3) Measurement of construct. The measurements employed in each study will be coded in terms of single-item scale vs. multi-item scale. Each relationship contains two constructs. If both

constructs employed a multi-item scale, the relationship was coded as a multi-item scale relationship. Other than that, all relationships were coded as single-item scale relationships.

(4) Theoretical basis. The theoretical foundation, or lack thereof, will be coded if any theory is employed in a study.

(5) Other research characteristics. In addition to the research characteristics addressed above, other characteristics such as the year of publication, effect size estimation (no estimation vs. estimation), product category (inductively categorized), funding source (government and private), and field of publication (marketing, communication, advertising, medical science, and other).

Rater Reliability

In meta-analytic studies, the assessment of rater reliability is of great importance to critics, reviewers, and general readers. Observations and coding of the study characteristics should be reliable and objective. Accurate coding is undoubtedly crucial to the conclusions generated from any synthesis of study effect sizes. Thus, it was vital to perform an interrater reliability check on the accuracy of the coding process. Interrater reliability refers to the degree of agreement or consistency that exists between two or more raters (Klein 2000). The reliability of raters is assessed to determine whether the coding process is free from bias or error.

In most meta-analytic studies, two or more raters code most (or all) of the available studies on the basis of coding schemes. For the current research, another rater was recruited to rate a subset of the articles in the database, and this rater was trained on the coding categories that were investigated in the current research. The subset of ratings was performed on six articles chosen by the author from the complete database of coded articles. This subset represents 16.7% of the final database. Interrater reliability was defined as the frequency of agreement on codes divided by the total number of coded categories per section, expressed as a percentage.

Reliability was calculated on the four coding categories listed in Table 3-2. The levels of agreement between the primary and second coders were generally high, with a mean overall agreement of 98.2%.

Fixed Versus Random Effect Models

Meta-analysis is used to obtain the true effect sizes in a population by combining effect sizes from independent studies. There are two ways to ascertain the true effect sizes: fixed effects and random effects models (Hedges 1992; Hedges and Vevea 1998). In the fixed effect model (also called the homogeneous case), the true effect sizes in the population are fixed but have unknown constants. It is assumed that the effect size in the population is the same for all studies included in a meta-analysis. Another model for the effect size synthesis is the random effect model. The assumption of the random effect model is that the population effect sizes vary randomly from study to study because every study in a meta-analysis comes from a population that is likely to have a different effect size to any other study in the meta-analysis. This is also referred to as the heterogeneous case. Population effect sizes are assumed to be sampled from a universe of possible effect, which is called a “super-population” (Hedges 1992, Hunter and Schmidt 2000). In statistical terms, the choice of one model over another makes a difference in the calculation of the standard errors associated with the combined effect size.

One of the main differences between the two models is that the fixed effect model is appropriate only for conditional inferences, whereas the random effect model facilitates unconditional inferences. Social science researchers typically want to make unconditional inferences; thus, the random effect model is often more appropriate. However, the standard errors in the random effect model are larger than in the fixed model when effect sizes are heterogeneous (Field 2001). Moreover, transformed correlation coefficients, which are used in

fixed effect models, can eliminate a bias in the untransformed correlation coefficients, which are used in random effect models (Silver and Dunlap 1987). The transformation (e.g., Fisher's r to z transformation) corrects for a skew in the sampling distribution of correlation coefficients. For the present study, therefore, the fixed effect model was used to combine effect sizes from primary studies.

File Drawer Problem

A common concern surrounding the meta-analytic research method is that researchers can never be certain that their review contains all studies pertaining to the research domain. As published studies are more easily obtained, it is more likely that a meta-analysis contains the highest quality studies of a given subject area, which are also often those containing statistically significant outcomes. Moreover, the situation that any number of unpublished works could influence overall findings is a persistent problem for meta-analysis. Such studies remain in the “file-drawers” of the researchers. This problem was given the name “file drawer problem” by Rosenthal (1979). The file-drawer problem appears to have two causes: the reluctance of researchers to report their null results and the reluctance of professional journal editors to include studies whose results fail to reach statistical significance. Taking this into account, Rosenthal developed a fail-safe N statistic. As Brown (1992) states, “The fail-safe N statistic is a follow-up test used with meta-analysis to estimate the number of new, unpublished, or unretrieved non-significant (null-result) studies what would, on the average, change the significance of a meta-analysis study to non-significance” (p. 179).

To calculate the fail-safe N , Rosenthal (1979) provided a formula that used the combined Z -scores from the articles included in the meta-analysis to determine the number of non-significant (or null-effect) studies. The formula is as follows:

$$X = [(SUM Z)^2 / G] - k$$

where X = the number of studies needed to reverse the statistically significant findings, k = the number of studies combined in the meta-analysis, $(SUM Z)$ = the sum of the Z scores for the individual studies, and G = the Z score that falls at the p -critical value being evaluated. The current study set the p -critical value at .05. Therefore, a Z score of 1.645 was the denominator of the formula. For example, in Table 5, the fail-safe N analysis yielded an answer of 47,112 for the A_{ad} -intention relation. This means that in order to bring the meta-analytic review's level of statistical significance down to the .05 level, 47,112 non-significant studies would be needed. Rosenthal (1969) wrote "one could regard as resistant to the file drawer problem any combined results for which the tolerance level X reaches $5k + 10$ " (p/ 640), where k equals the number of studies in the meta-analysis. This means that if a meta-analysis contained 45 studies (the number of studies for the A_{ad} -intention relation), if the fail-safe N value were 235 or bigger then results could be considered stable. The 47,112 markedly exceeds the 235. This result would be ideal for the current study. This confidence is due to the unlikely chance that 47,112 studies that found non-significant results were not included in the current study because they failed to be published or because they were simply overlooked by the author in the literature review. Other fail-safe N s for each pairwise relationship were also presented in Table 3-3.

Chapter Summary

Chapter 3 provided a description of the methodology used in conducting the current meta-analysis examining the effect of ad attitudes on behavioral intentions and other pairwise relationships. The usefulness of the meta-analytic technique and the three steps of conducting meta-analysis were presented. The three steps included database development, effect size transformation, and the method of analysis. Studies for the meta-analysis were found through the

use of electronic databases and bibliographies of other literature. Study selection was based on the selection criteria. After all studies were selected and coded, coding reliability and publication bias were assessed to ensure that the results of the analysis are appropriated drawn.

Table 3-1. The Conversion Statistical Equations

t to $r = t / \sqrt{t^2 + N - 2}$	t distribution, df (degrees of freedom)
d to $r = d / \sqrt{d^2 + 4}$	N (sample size)
F to $r = \sqrt{F / (F + df_{error})}$	χ^2 (chi square)
χ^2 to $r = \sqrt{\chi^2 / N}$	F distribution
Z to $r = Z / \sqrt{N - 1}$	d (effect size)

Table 3-2. Interrater Reliability for Coded Categories

Section	Interrater Agreement
Bibliographic information	100%
Study participants	100%
Methodology	96.1%
Effect size	97.3%
Overall	98.2%

Table 3-3. Analysis of the File Drawer Problem

Relationship	k	Fail-Safe N at .05 level	Relationship	k	Fail-Safe N at .05 level
Age- A_{ad}	6	86	Age-Intention	21	104*
Gender- A_{ad}	5	16*	Gender-Intention	12	185
Ethnicity- A_{ad}	6	228	Ethnicity-Intention	10	-5*
Education- A_{ad}	7	712	Education-Intention	16	13*
Health Status- A_{ad}	9	-8*	Health Status-Intention	9	845
Involvement- A_{ad}	3	55	Involvement-Intention	4	332
Ad exposure- A_{ad}	5	-2*	Drug usage-Intention	10	1176
Ad awareness- A_{ad}	2	1*	Income-Intention	8	-6*
Drug use- A_{ad}	4	0*	Media consumption-Intention	7	8*
Income- A_{ad}	4	109	Ad exposure-Intention	10	2608
			Ad awareness-Intention	8	10*
			Aad-Intention	45	47112
			A_{ad} -Pharmacist Intention	4	56
			A_{ad} -Friend Intention	2	3*

Note.

k = number of studies in the meta-analysis

*Fail-Safe N ($X = [(SUM Z)^2 / G] - k > \text{Tolerance level } X (5k + 10)$)

CHAPTER 4 RESULTS

The overall objective of the current study is to provide a quantitative review of antecedents- A_{ad} -consequences constructs and to investigate their relationships in the context of DTCA. The variables included in these relationships are depicted in Figure 2-1. This study employed the meta-analytic technique to statistically identify the strength and direction of the pairwise relationships. Upon completion of the coding process, it was determined that 36 studies would contribute data for the current meta-analytic database. Thirty six independent studies provided 278 effect sizes. The sample sizes ranged from 80 to 3001 ($M = 941.00$; $SD = 802.40$), yielding a total sample of 261,597. Thirty studies were published in the 2000s, 4 in the 1990s, and 2 in the 1980s. Appendix A and B summarized other characteristics of collected studies such as authorships, author disciplines, published fields and sites, characteristics of samples, and methodology.

The results of this study will be reported in four different areas. These areas address the following: (a) antecedents of A_{ad} , (b) consequences of A_{ad} , (c) other relationships, and (d) the potential moderating influence of study characteristics on the pairwise relationships. Tables 5 through 9 contain the results of the meta-analysis for the hypotheses and research questions. The tables display the key results from each studied topic. The information found in these tables includes the number of participants in each analysis (N), the number of independent effect sizes (i.e., correlation coefficients) in each analysis (k), the mean observed correlation (r), Fisher's Z (Z_r), the standard deviation of Fisher's Z (SD_{Z_r}), and 95% confidence intervals around Fisher's Z (CI_{Z_r}). The interpretation of effect size magnitude is guided by Cohen's (1988) definitions of small ($r = .10$), moderate ($r = .30$), and large ($r = .50$) effect sizes. Cohen (1988) established the medium effect size as one that was large enough so that people would naturally recognize it in

everyday life, the small effect size to be one that was noticeably smaller, but not trivial, and the large effect size to be the same distance above the medium effect size as small was below it.

Figure 4-1 provides a summary of the results of the current study.

Antecedents of Attitude toward the Ad

Demographic factors, ad exposure, drug usage, health status, involvement, ad awareness, and ad exposure were examined as antecedents of A_{ad} . The results of the conducted antecedents- A_{ad} meta-analysis are presented in Table 4-1. The total sample size across the collected empirical studies was 51,753 with 51 reported or converted correlations.

The number of independent effect sizes (k), the means of the observed correlations (r) and the Fisher's Z_r and 95% confidence intervals around the Fisher's Z_r (CI_{Z_r}) between antecedents and A_{ad} are as follows: Age - A_{ad} ($k = 6$, $r = -.03$, $Z_r = -.03$, CI_{Z_r} 5% = $-.15$, and CI_{Z_r} 95% = $.09$), Gender - A_{ad} ($k = 5$, $r = .02$, $Z_r = .02$, CI_{Z_r} 5% = $-.08$, and CI_{Z_r} 95% = $.10$), Ethnicity - A_{ad} ($k = 6$, $r = -.12$, $Z_r = -.12$, CI_{Z_r} 5% = $-.27$, and CI_{Z_r} 95% = $.02$), Education - A_{ad} ($k = 7$, $r = -.12$, $Z_r = -.12$, CI_{Z_r} 5% = $-.23$, and CI_{Z_r} 95% = $-.01$), Health status - A_{ad} ($k = 9$, $r = .02$, $Z_r = .02$, CI_{Z_r} 5% = $-.04$, and CI_{Z_r} 95% = $.08$), Involvement - A_{ad} ($k = 3$, $r = .27$, $Z_r = .32$, CI_{Z_r} 5% = $-.77$, and CI_{Z_r} 95% = 1.41), Ad exposure - A_{ad} ($k = 5$, $r = .02$, $Z_r = .02$, CI_{Z_r} 5% = $-.24$, and CI_{Z_r} 95% = $.029$), Ad awareness - A_{ad} ($k = 2$, $r = .04$, $Z_r = .04$, CI_{Z_r} 5% = -2.00 , and CI_{Z_r} 95% = 2.08), Drug usage - A_{ad} ($k = 4$, $r = .05$, $Z_r = .05$, CI_{Z_r} 5% = $-.08$, and CI_{Z_r} 95% = $.17$), and Income - A_{ad} ($k = 4$, $r = -.08$, $Z_r = -.08$, CI_{Z_r} 5% = $-.13$, and CI_{Z_r} 95% = $-.03$).

The findings of a statistical significance at the 95% confidence level show that education - A_{ad} and income - A_{ad} relationships do not include 0, which indicates that education and income are significant predictors of A_{ad} . Although the education- and income- A_{ad} relationships are statistically significant, the strength of the relationships is small. Such other factors as age,

gender, ethnicity, health status, involvement, ad exposure, ad awareness, and drug usage do not predict consumers' attitudes toward the ad in the extant DTCA literature. The results reject H₃ and H₄, which predicted that A_{ad} was a function of ad awareness/ad exposure and health status/involvement.

Attitude toward the Ad and Outcomes

The current research investigated the relationship between A_{ad} and outcomes variables such as behavioral intentions and brand attitudes. Table 4-2 presents the results of these analyses. The total sample size across the collected studies was 54,282 with 45 reported or converted correlations.

Consistent with H1, A_{ad} is a significant predictor of behavioral intentions. The mean correlation between A_{ad} and behavior intentions was 0.19, which was statistically significant. The A_{ad}-intention relationship was consistently positive as indicated by the confidence interval, which did not include zero. The findings of a statistical significance at the 95% confidence level indicated that the relationship falls within a 0.14 - 0.24 interval.

In the DTC studies, behavioral intentions have been operationalized in four different ways such as intention to request physicians to prescribe the advertised drugs (Intention 1), intentions to ask physicians for more information about the advertised drugs (Intention 2), intentions to search more information about the advertised drugs (Intention 3), and intentions to visit their physicians (Intention 4). To clarify the relationship, the current research further analyzed the relationship A_{ad} and four-differently-operationalized-intentions. The means and confidence intervals of correlations are $k = 8$, $r = .29$, $Z_r = .29$, $CI_{Z_r} 5\% = .18$, and $CI_{Z_r} 95\% = .40$ for the A_{ad} and Intention 1 relation, $k = 14$, $r = .16$, $Z_r = .16$, $CI_{Z_r} 5\% = .08$, and $CI_{Z_r} 95\% = .24$ for the A_{ad} and Intention 2 relation, $k = 4$, $r = .15$, $Z_r = .15$, $CI_{Z_r} 5\% = -.01$, and $CI_{Z_r} 95\% = .31$ for

the A_{ad} -Intention 3 relation, and $k = 19$, $r = .18$, $Z_r = .18$, $CI_{Z_r} 5\% = .11$, and $CI_{Z_r} 95\% = .25$ for the A_{ad} -Intention 4 relation. Regardless of the operationalization of the behavioral intentions, all relationships are at least marginally significant. More specifically, A_{ad} is a statistically significant predictor of consumers' intentions (a) to request physicians to prescribe the advertised drug, (b) to ask physicians for more information about the advertised drugs, and (c) to visit their physicians. The relationship between A_{ad} and intentions to search more information about the advertised drugs is marginally significant.

Most studies investigating the A_{ad} -intention relation have focused on patient-physician relationships. However, some studies have been interested in looking at the patient and non-physician relationships such as patient-pharmacist, patient-patient's friend, and patient-nurse relationships. These studies have assessed the role of A_{ad} in terms of predicting (a) intentions to ask pharmacists for more information about the advertised drugs (Pharmacist Intention), (b) intentions to ask nurses for more information about the advertised drugs (Nurse Intention), and (c) intentions to ask patients' friends/family for more information about the advertised drugs (Friend Intention). The means and confidence intervals of the correlations are $k = 4$, $r = .15$, $Z_r = .15$, $CI_{Z_r} 5\% = .11$, and $CI_{Z_r} 95\% = .19$ for the A_{ad} and pharmacist intention relation and $k = 2$, $r = .13$, $Z_r = .13$, $CI_{Z_r} 5\% = -1.43$, and $CI_{Z_r} 95\% = 1.69$ for the A_{ad} and friend intention relation. The relationship between A_{ad} and nurse intention has not appeared in multiple studies. Since meta-analytic research needs at least two research findings on the same topic, the relationship was not included in the current study. Statistical significance at the 95% confidence level indicated that consumers' attitudes toward the ad are positively related to their intentions to ask pharmacists for more information about the advertised prescription drugs. The results of the patient and non-physician relations are presented in Table 4-3. Furthermore, in H_2 , it was

predicted that brand attitude would be a function of A_{ad} . However, the relationship could not be tested because only one study had addressed the role of A_{ad} in terms of predicting brand attitudes.

Ad Awareness

The comprehensive search for previous research on DTCA found that a number of studies have investigated the construct of ad awareness. However, only two studies addressed ad awareness as a predictor of A_{ad} . The number of independent effect sizes (k), the means of the observed correlations (r) and the Fisher's Z_r and 95% confidence intervals around the Fisher's Z_r (CI_{Z_r}) between ad awareness and A_{ad} are as follows: Ad awareness - A_{ad} ($k = 2$, $r = .04$, $Z_r = .04$, $CI_{Z_r} 5\% = -2.00$, and $CI_{Z_r} 95\% = 2.08$). Thus, the third hypothesis is rejected.

In addition to the relationships between ad awareness and A_{ad} , this study also analyzed the relationship between ad awareness and behavioral intentions. However, the results revealed that the relationship is small and insignificant ($k = 8$, $r = .09$, $Z_r = .09$, $CI_{Z_r} 5\% = -.08$, and $CI_{Z_r} 95\% = .26$). Besides the relationship, such constructs as age, education, and health status have been tested as antecedents of ad awareness. The number of independent effect sizes (k), the means of the observed correlations (r), and the Fisher's Z_r and 95% confidence intervals around Fisher's Z_r (CI_{Z_r}) for antecedents and ad awareness relationships are as follows: Age – Ad awareness ($k = 3$, $r = .08$, $Z_r = .08$, $CI_{Z_r} 5\% = -.27$, and $CI_{Z_r} 95\% = .43$), Education – Ad awareness ($k = 2$, $r = -.02$, $Z_r = -.02$, $CI_{Z_r} 5\% = -1.69$, and $CI_{Z_r} 95\% = 1.65$), and Health status – Ad awareness ($k = 2$, $r = .03$, $Z_r = .03$, $CI_{Z_r} 5\% = -1.51$, and $CI_{Z_r} 95\% = 1.58$). The results of the meta-analyses could not find significant antecedents and outcomes of ad awareness.

Other Relationships

The current study also investigated A_{ad} -not-involved relationships (e.g., personal difference variables-behavioral intention relation). Table 4-4 presents the results of these analyses.

DTCA researchers have investigated the effects of such personal differences as demographic factors on behavioral intentions. The number of independent effect sizes (k), the means of the observed correlations (r) and Fisher's Z_r and 95% confidence intervals around Fisher's Z_r (CI_{Z_r}) for the non-hypothesized relationships are as follows; Age - Intention ($k = 21$, $r = .02$, $Z_r = .02$, CI_{Z_r} 5% = $-.02$, and CI_{Z_r} 95% = $.07$), Gender - Intention ($k = 12$, $r = .05$, $Z_r = .05$, CI_{Z_r} 5% = $.02$, and CI_{Z_r} 95% = $.08$), Ethnicity - Intention ($k = 10$, $r = -.01$, $Z_r = -.01$, CI_{Z_r} 5% = $-.05$, and CI_{Z_r} 95% = $.03$), Education - Intention ($k = 16$, $r = -.02$, $Z_r = -.02$, CI_{Z_r} 5% = $-.07$, and CI_{Z_r} 95% = $.04$), Health status - Intention ($k = 9$, $r = -.12$, $Z_r = -.12$, CI_{Z_r} 5% = $-.15$, and CI_{Z_r} 95% = $-.09$), Involvement - Intention ($k = 4$, $r = .23$, $Z_r = .24$, CI_{Z_r} 5% = $-.03$, and CI_{Z_r} 95% = $.51$), Drug usage - Intention ($k = 10$, $r = .14$, $Z_r = .15$, CI_{Z_r} 5% = $.09$, and CI_{Z_r} 95% = $.20$), Income - Intention ($k = 8$, $r = .02$, $Z_r = .03$, CI_{Z_r} 5% = $-.11$, and CI_{Z_r} 95% = $.17$), Media consumption - Intention ($k = 7$, $r = .06$, $Z_r = .06$, CI_{Z_r} 5% = $-.07$, and CI_{Z_r} 95% = $.19$), and Ad exposure - Intention ($k = 10$, $r = .23$, $Z_r = .24$, CI_{Z_r} 5% = $.16$, and CI_{Z_r} 95% = $.32$). Statistical significance at the 95% confidence level shows that gender – intention, health status – intention, drug usage – intention, and ad exposure - intention relationships do not include 0, which indicates that gender, health status, drug usage, and ad exposure are significant predictors of behavioral intentions in the extant DTCA literature. Such other factors as age, ethnicity, education, involvement, income, and media consumption do not predict consumers' behavioral intentions.

As noted previously, DTCA researchers have operationalized behavioral intentions in four different ways (e.g., intention to request physicians to prescribe the advertised drugs - Intention 1, intentions to ask physicians for more information about the advertised drugs - Intention 2, intentions to discuss symptoms/the advertised drugs with physicians - Intention 3, and intentions to visit their physicians - Intention 4). To clarify the relationship between personal difference variables and behavioral intentions, this study further investigated the relationships between personal difference variables and four-differently-operationalized-intentions. Statistical significance at the 95% confidence level shows that drug usage is the only significant predictor of intention 1 ($k = 3$, $r = .10$, $Z_r = .10$, $CI_{Z_r} 5\% = .07$, and $CI_{Z_r} 95\% = .14$), health status, drug usage, and ad exposure are the significant predictors of intention 2 (for health status $k = 3$, $r = -.10$, $Z_r = -.10$, $CI_{Z_r} 5\% = -.21$, and $CI_{Z_r} 95\% = -.00$, for drug usage $k = 4$, $r = .13$, $Z_r = .13$, $CI_{Z_r} 5\% = .10$, and $CI_{Z_r} 95\% = .16$, and for ad exposure $k = 4$, $r = .34$, $Z_r = .36$, $CI_{Z_r} 5\% = .26$, and $CI_{Z_r} 95\% = .45$), and gender, health status, and ad exposure are the significant predictors of intention 3 (for gender $k = 6$, $r = .05$, $Z_r = .05$, $CI_{Z_r} 5\% = .02$, and $CI_{Z_r} 95\% = .08$, for health status $k = 5$, $r = -.14$, $Z_r = -.14$, $CI_{Z_r} 5\% = -.19$, and $CI_{Z_r} 95\% = -.09$, for ad exposure $k = 6$, $r = .16$, $Z_r = .16$, $CI_{Z_r} 5\% = .13$, and $CI_{Z_r} 95\% = .19$). No study has investigated the relationship between personal difference variables and Intention 4.

In addition to the findings of the relationships between personal difference variables and behavioral intentions in the extant DTCA literature, the researcher has studied such other relationships as gender-drug usage, ethnicity-drug usage, education-drug usage, age-health status, education-health status, involvement-price perception, involvement-health status, drug knowledge-behavioral intention, ad message clarity- A_{ad} , age-ad exposure, and gender-ad exposure. However, those relationships have not appeared in multiple studies. Since meta-

analytic research needs at least two research findings on the same topic, the relationships were not included in the current study.

Moderator Analyses

Moderator analyses were conducted to further clarify the strength of each pairwise relationship. Hunter et al. (1982) suggested that a moderator will show itself in the way: the average correlation coefficient will vary from subset to subset (e.g., between student sample and non-student sample). The differences between the subset results were tested statistically using a *t* test. Table 10 reports the results of the moderator analyses including the means and significance of each moderator for both observed correlation coefficients and Fisher's *Z*-transformations of the correlation coefficients. The first conclusion drawn from Table 10 is that the results of the analyses of the observed correlation coefficients and Fisher's *Z*-transformations are almost identical. Thus, the discussion below does not distinguish between the observed correlations and Fisher's *Z*-transformation results (the statistics for the subgroup analyses are for Fisher's *Z*-transformations).

The analyses were mainly conducted on five factors: study sample characteristic (student vs. non-student and local vs. nationwide sample), number of scale items (single vs. multiple-item scale), theoretical foundation (theoretical vs. atheoretical study), research method (experiment vs. survey), and degree of effect size estimation (no-estimation vs. estimation). It was expected that studies would use a student sample and multi-item scale, and theories would have stronger relationships than those using a non-student sample, single-item measures, and non-theories. However, no relationships were affected by the type of sample, the number of scale items, and theoretical foundation.

This study also tested the moderator effects of the degree of effect size estimation (no estimation vs. estimation), study sampling location (local sample vs. nationwide sample), and research method (experiment vs. survey). The analyses revealed that a stronger relationship between drug usage and behavioral intentions was detected in the studies with reported effect sizes than those with estimated effect sizes (.07 - no estimation vs. .03 - estimation). The study sampling location appeared to have a more consistent effect than did other moderators across all relationships identified. The use of a local sample resulted in stronger relationships than the use of a nationwide sample in age – A_{ad} (.16 – local sample vs. -.07 – nationwide sample), ethnicity – intention (-.11 vs. .00), and income – intention (.24 vs. -.05) relationships. The research method was tested as a potential moderator. However, no relationships were affected by the research method.

Figure 4-1. Summary of Results

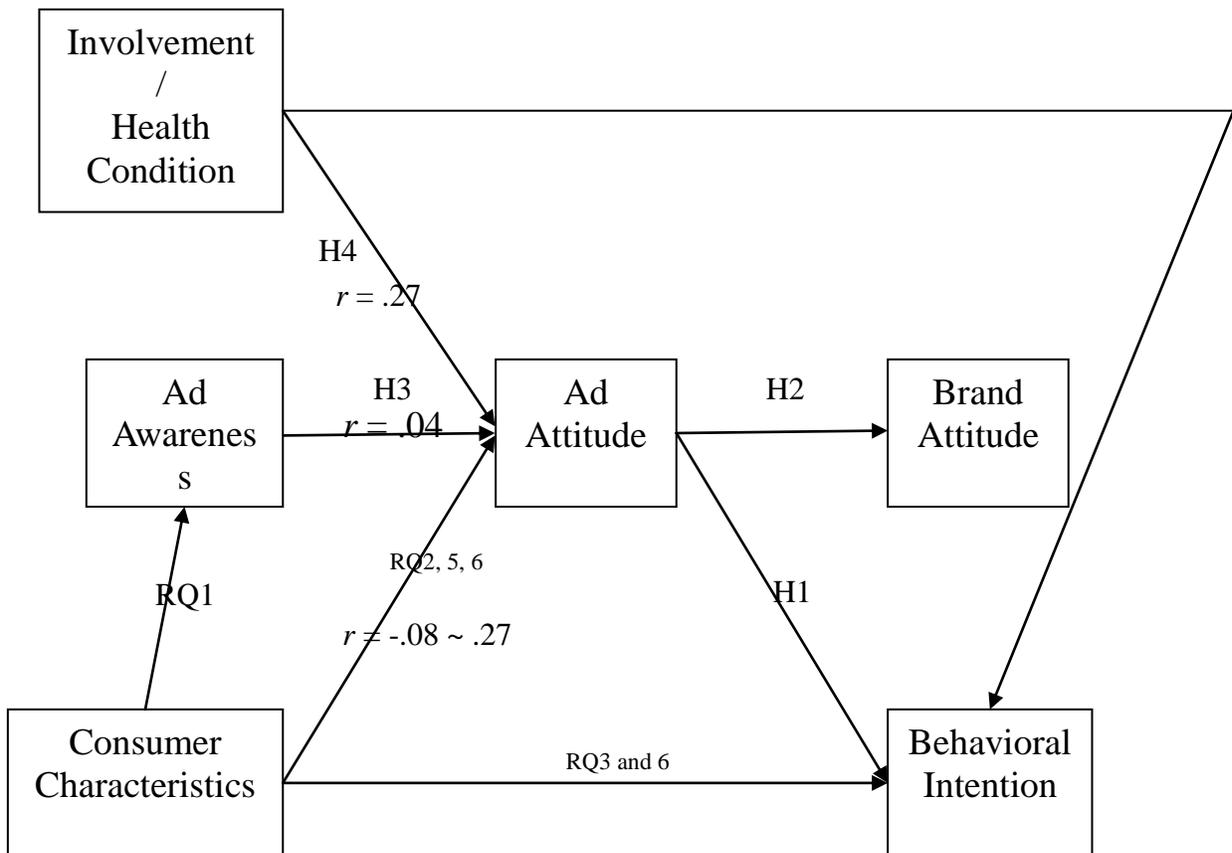


Table 4-1. Analysis of the Relationship between Antecedents and Aad

IV	DV	N	k	R	Z _r	SE _{Z_r}	CI _{Z_r} 5%	CI _{Z_r} 95%
Age	A _{ad}	7634	6	-.03	-.03	.05	-.15	.09
Gender		2141	5	.02	.02	.03	-.70	.10
Ethnicity		7573	6	-.12	-.12	.06	-.27	.02
Education		9067	7	-.12	-.12	.05	-.23	-.01
Health Status		11147	9	.02	.02	.03	-.04	.08
Involvement		480	3	.27	.32	.25	-.77	1.41
Ad exposure		2295	5	.02	.02	.09	-.24	.29
Ad awareness		468	2	.04	.04	.16	-2.00	2.08
Drug use		4207	4	.05	.05	.08	-.08	.17
Income		6741	4	-.08	-.08	.02	-.13	-0.03

Note. IV = Independent Variable, DV = Dependent Variable, k = number of correlation coefficients, r = mean observed correlation, Z_r = Fisher's Z between Aad and intention, SD_{Z_r} = estimated standard deviation of Fisher's Z, CI_{Z_r} 5% = lower bound of the confidence interval for Fisher's Z, CI_{Z_r} 95% = upper bound of the confidence interval for Fisher's Z

Table 4-2. Analysis of the Relationship between Aad and Intentions

IV	DV	N	k	r	Z _r	SD _{Z_r}	CI _{Z_r} 5%	CI _{Z_r} 95%
A _{ad}	Overall Intention	54,282	45	.19	.20	.03	.14	.25*
A _{ad}	Intention 1	7618	8	.29	.29	.06	.18	.40*
	Intention 2	18479	14	.16	.16	.04	.08	.24*
	Intention 3	2342	4	.15	.15	.08	-.01	.31
	Intention 4	25843	19	.18	.18	.04	.11	.25*

Note. Intention 1 = Intention to request physicians to prescribe the advertised drugs, Intention 2 = Intention to ask physicians for more information about the advertised drugs, Intention 3 = Intentions to discuss symptoms/the advertised drugs with physician, Intention 4 = Intention to visit a physician, k = number of correlation coefficients, r = mean observed correlation, Z_r = Fisher's Z between Aad and intention, SD_{Z_r} = estimated standard deviation of Fisher's Z, CI_{Z_r} 5% = lower bound of the confidence interval for Fisher's Z, CI_{Z_r} 95% = upper bound of the confidence interval for Fisher's Z

Table 4-3. Analysis of the Relationship between Aad and Other Outcomes

IV	DV	<i>N</i>	<i>k</i>	<i>r</i>	Z_r	SE_{Z_r}	CI_{Z_r} 5%	CI_{Z_r} 95%
Aad	Pharmacist Intention	1164	4	0.15	0.15	0.01	0.11	0.19*
	Friend Intention	450	2	0.02	0.02	0.03	-0.7	0.1

Note. Aad = Attitude toward the ad, Pharmacist Intention = intention to ask pharmacist more information about the advertised drugs, Friend Intention = intention to ask patients' friends more information about the advertised drugs, *k* = number of correlation coefficients, *r* = mean observed correlation, Z_r = Fisher's Z between Aad and intention, SD_{Z_r} = estimated standard deviation of Fisher's Z, CI_{Z_r} 5% = lower bound of the confidence interval for Fisher's Z, CI_{Z_r} 95% = upper bound of the confidence interval for Fisher's Z

Table 4-4. Analysis of the Non-Hypothesized Relationships

IV	DV	N	k	R	Z _r	SE _{Z_r}	CI _{Z_r} 5%	CI _{Z_r} 95%
Age	Overall Intention	21,208	21	.02	.02	.02	-.02	.07
Age	Intention 1	3,334	4	.01	.01	.09	-.26	.29
	Intention 2	10,049	10	.03	.03	.03	-.04	.11
	Intention 3	7,825	7	.02	.03	.02	-.04	.08
	Intention 4	0	0	N/A	N/A	N/A	N/A	N/A
Gender	Overall Intention	10,515	12	.05	.05	.01	.02	.08*
Gender	Intention 1	80	1	.08	.08	N/A	N/A	N/A
	Intention 2	3,897	5	.05	.05	.02	-.01	.11
	Intention 3	6,538	6	.05	.05	.02	.02	.08*
	Intention 4	0	0	N/A	N/A	N/A	N/A	N/A
Ethnicity	Overall Intention	11,965	10	-.01	-.01	.02	-.05	.03
Ethnicity	Intention 1	1,647	1	.05	.05	N/A	N/A	N/A
	Intention 2	4,152	5	-.02	-.02	.03	-.09	.05
	Intention 3	6,166	4	-.02	-.02	.03	-.10	.07
	Intention 4	0	0	N/A	N/A	N/A	N/A	N/A
Education	Overall Intention	15,200	16	-.02	-.02	.03	-.07	.04
Education	Intention 1	315	2	-.06	-.07	.17	-2.25	2.12
	Intention 2	8,454	9	.00	.00	.02	-.05	.05
	Intention 3	6,431	5	-.03	-.03	.06	-.19	.14
	Intention 4	0	0	N/A	N/A	N/A	N/A	N/A
Health Status	Overall Intention	11,822	9	-.12	-.12	.01	-.15	-.09*
Health Status	Intention 1	80	1	-.09	-.09	N/A	N/A	N/A
	Intention 2	4,511	3	-.10	-.10	.02	-.21	-.00*
	Intention 3	7,231	5	-.14	-.14	.02	-.19	-.09*
	Intention 4	0	0	N/A	N/A	N/A	N/A	N/A
Involvement	Overall Intention	4,904	4	.23	.24	.08	-.03	.51
Involvement	Intention 1	186	1	.14	.14	N/A	N/A	N/A
	Intention 2	4,718	3	.27	.28	.11	-.19	.75
	Intention 3	0	0	N/A	N/A	N/A	N/A	N/A
	Intention 4	0	0	N/A	N/A	N/A	N/A	N/A

Table 4-4. Continued

IV	DV	N	k	R	Z _r	SE _{Z_r}	CI _{Z_r} 5%	CI _{Z_r} 95%
Drug Usage	Overall Intention	10,070	10	.14	.15	.02	.09	.20*
Drug Usage	Intention 1	4,082	3	.10	.10	.01	.07	.14*
	Intention 2	3,737	4	.13	.13	.01	.10	.16*
	Intention 3	2,251	3	.21	.22	.07	-.08	.52
	Intention 4	0	0	N/A	N/A	N/A	N/A	N/A
Income	Overall Intention	7,879	8	.02	.03	.06	-.11	.17
Income	Intention 1	80	1	.37	.38	N/A	N/A	N/A
	Intention 2	3,181	3	.05	.05	.04	-.13	.24
	Intention 3	4,618	4	-.08	-.08	.02	-.16	-.00*
	Intention 4	0	0	N/A	N/A	N/A	N/A	N/A
Media Consumption	Overall Intention	833	7	.06	.06	.05	-.07	.19
Media Consumption	Intention 1	240	3	.04	.04	.12	-.47	.55
	Intention 2	240	3	.06	.06	.08	-.27	.39
	Intention 3	353	1	.12	.12	N/A	N/A	N/A
	Intention 4	0	0	N/A	N/A	N/A	N/A	N/A
Ad Exposure	Overall Intention	8,769	10	.23	.24	.03	.16	.32
Ad Exposure	Intention 1	0	0	N/A	N/A	N/A	N/A	N/A
	Intention 2	3,015	4	.34	.36	.03	.26	.45*
	Intention 3	5,754	6	.16	.16	.01	.13	.19*
	Intention 4	0	0	N/A	N/A	N/A	N/A	N/A

Note. Intention 1 = Intention to request physicians to prescribe the advertised drugs, Intention 2 = Intention to ask physicians for more information about the advertised drugs, Intention 3 = Intentions to search more information about the advertised drugs, Intention 4 = Intention to visit their physicians, k = number of correlation coefficients, r = mean observed correlation, Z_r = Fisher's Z between Aad and intention, SD_{Z_r} = estimated standard deviation of Fisher's Z, CI_{Z_r} 5% = lower bound of the confidence interval for Fisher's Z, CI_{Z_r} 95% = upper bound of the confidence interval for Fisher's Z

Table 4-5. Subgroup Means by Moderator Variables

	Student versus non- student	single versus multi- item scale	Theoretical versus atheoretical study	No- estimation versus estimation	Good versus bad estimation	Experiment versus survey	Local sample versus nationwide sample
Age-Aad							
<i>r</i>	.08 vs. -.08	-.10 vs. .03	-.03 vs. -.03	-.08 vs. .06			.16 vs. -.07*
<i>Zr</i>	.08 vs. -.09	-.10 vs. .03	-.03 vs. -.03	-.08 vs. .06	N/A	N/A	.16 vs. -.07*
<i>k</i> = 6	2 vs. 4	3 vs. 3	4 vs. 2	4 vs. 2			1 vs. 5
Gender-Aad							
<i>r</i>	.03 vs. .01	.05 vs. -.03	.01 vs. .03				
<i>Zr</i>	.03 vs. .01	.05 vs. -.03	.01 vs. .03	N/A	N/A	N/A	N/A
<i>k</i> = 5	1 vs. 4	3 vs. 2	4 vs. 1				
Ethnicity-Aad							
<i>r</i>	.07 vs. -.16	-.10 vs. -.15	-.10 vs. -.15	-.06 vs. -.26			-.26 vs. -.06
<i>Zr</i>	.07 vs. -.17	-.10 vs. -.16	-.10 vs. -.16	-.06 vs. -.27	N/A	N/A	-.27 vs. -.06
<i>k</i> = 6	1 vs. 5	3 vs. 3	3 vs. 3	4 vs. 2			2 vs. 4
Education-Aad							
<i>r</i>	-.11 vs. -.12	-.18 vs. -.04	-.07 vs. -.18	-.08 vs. -.22			.12 vs. -.16*
<i>Zr</i>	-.11 vs. -.12	-.18 vs. -.04	-.07 vs. -.19	-.08 vs. -.22	N/A	N/A	.12 vs. -.16*
<i>k</i> = 7	1 vs. 6	4 vs. 3	4 vs. 3	5 vs. 2			1 vs. 6
Health Status-Aad							
<i>r</i>	.04 vs. .01	-.01 vs. .04	.05 vs. -.05	.03 vs. .01	.02 vs. .00		.13 vs. -.01
<i>Zr</i>	.04 vs. .01	-.01 vs. .04	.05 vs. -.05	.03 vs. .01	.02 vs. .00	N/A	.13 vs. -.01
<i>k</i> = 9	2 vs. 7	4 vs. 5	6 vs. 3	6 vs. 3	8 vs. 1		2 vs. 6
Involvement-Aad							
<i>r</i>					.40 vs. .00		
<i>Zr</i>	N/A	N/A	N/A	N/A	.48 vs. .00	N/A	N/A
<i>k</i> = 3					2 vs. 1		

Table 4-5. Continued

	Student versus non- student	single versus multi- item scale	Theoretical versus atheoretical study	No- estimation versus estimation	Good versus bad estimation	Experiment versus survey	Local sample versus nationwide sample
Ad Exposure-Aad							
<i>r</i>	.01 vs. .05		.32 vs. -.05	.01 vs. .05		.32 vs. -.05	-.23 vs. .01
<i>Zr</i>	.01 vs. .05	N/A	.33 vs. -.05	.01 vs. .05	N/A	.33 vs. -.05	-.23 vs. .01
<i>k</i> = 5	3 vs. 2		1 vs. 4	3 vs. 2		1 vs. 4	1 vs. 3
Ad Awareness-Aad							
<i>r</i>							
<i>Zr</i>	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<i>k</i> = 2							
Drug Usage-Aad							
<i>r</i>	.05 vs. .05	.00 vs. .06	.13 vs. .02	-.04 vs. .07	.06 vs. .00		.07 vs. .03
<i>Zr</i>	.05 vs. .05	.00 vs. .06	.13 vs. .02	-.04 vs. .07	.06 vs. .00	N/A	.07 vs. .03
<i>k</i> = 4	2 vs. 2	1 vs. 3	1 vs. 3	1 vs. 3	3 vs. 1		2 vs. 2
Income-Aad							
<i>r</i>		-.09 vs. -.07	-.09 vs. -.07	-.09 vs. -.07			
<i>Zr</i>	N/A	-.09 vs. -.07	-.09 vs. -.07	-.09 vs. -.07	N/A	N/A	N/A
<i>k</i> = 4		3 vs. 1	4 vs. 1	5 vs. 1			
Ad Awareness-Intention							
<i>r</i>		.11 vs. -.06	.20 vs. .05				.18 vs. -.07
<i>Zr</i>	N/A	.11 vs. -.06	.22 vs. .05	N/A	N/A	N/A	.19 vs. -.07
<i>k</i> = 8		7 vs. 1	2 vs. 6				5 vs. 3
Aad-Intention							
<i>r</i>	.07 vs. .21*	.17 vs. .20	.22 vs. .16	.17 vs. .21	.19 vs. .21	.19 vs. .16	.19 vs. .19
<i>Zr</i>	.07 vs. .22*	.17 vs. .25	.24 vs. .16	.17 vs. .22	.20 vs. .22	.20 vs. .16	.20 vs. .20
<i>k</i> = 45	6 vs. 39	29 vs. 16	22 vs. 23	19 vs. 26	42 vs. 3	41 vs. 4	10 vs. 35

Table 4-5. Continued

	Student versus non- student	single versus multi- item scale	Theoretical versus atheoretical study	No- estimation versus estimation	Good versus bad estimation	Experiment versus survey	Local sample versus nationwide sample
Aad-Pharmacist Intention							
<i>r</i>	.11 vs. .16	.14 vs. .15	.14 vs. .15	.14 vs. .15			.13 vs. .17
<i>Zr</i>	.11 vs. .17	.14 vs. .16	.14 vs. .16	.14 vs. .15	N/A	N/A	.13 vs. .17
<i>k</i> = 4	1 vs. 3	2 vs. 2	2 vs. 2	1 vs. 3			2 vs. 2
Age-Intention							
<i>r</i>	-.03 vs. .04		.02 vs. .03	.01 vs. .03	.01 vs. .04	.02 vs. .05	.07 vs. .01
<i>Zr</i>	-.03 vs. .04	N/A	.02 vs. .03	.01 vs. .03	.01 vs. .04	.02 vs. .05	.08 vs. .01
<i>k</i> = 21	3 vs. 17		5 vs. 16	7 vs. 14	12 vs. 9	19 vs. 2	4 vs. 17
Gender-Intention							
<i>r</i>	.07 vs. .04	.06 vs. -.00*	.04 vs. .05	.07 vs. .03*	.06 vs. .00		.08 vs. .04
<i>Zr</i>	.07 vs. .04	.06 vs. -.00*	.04 vs. .05	.07 vs. .03*	.06 vs. .00	N/A	.08 vs. .04
<i>k</i> = 12	3 vs. 9	10 vs. 2	5 vs. 7	6 vs. 6	10 vs. 2		2 vs. 10
Ethnicity-Intention							
<i>r</i>	-.03 vs. -.00	-.02 vs. .01	-.01 vs. -.01	-.01 vs. -.01	-.02 vs. .05		-.11 vs. .00*
<i>Zr</i>	-.03 vs. -.00	-.02 vs. .01	-.01 vs. -.01	-.01 vs. -.01	-.02 vs. .05	N/A	-.11 vs. .00*
<i>k</i> = 10	4 vs. 6	8 vs. 2	5 vs. 5	6 vs. 4	9 vs. 1		1 vs. 9
Education-Intention							
<i>r</i>	.02 vs. -0.03	-.02 vs. .01	-.03 vs. -.01	.01 vs. -.04	-.02 vs. .00		-.07 vs. .01
<i>Zr</i>	.02 vs. -0.04	-.02 vs. .01	-.03 vs. -.01	.01 vs. -.04	-.02 vs. .00	N/A	-.07 vs. .01
<i>k</i> = 16	5 vs. 11	13 vs. 3	5 vs. 11	8 vs. 8	15 vs. 1		5 vs. 11
Health Status-Intention							
<i>r</i>	-.12 vs. -.12	-.12 vs. -.13	-.14 vs. -.11	-.12 vs. -.12			-.09 vs. -.13
<i>Zr</i>	-.12 vs. -.12	-.12 vs. -.13	-.14 vs. -.11	-.12 vs. -.13	N/A	N/A	-.09 vs. -.13
<i>k</i> = 9	2 vs. 7	7 vs. 2	3 vs. 6	6 vs. 3			2 vs. 7

Table 4-5. Continued

	Student versus non- student	single versus multi- item scale	Theoretical versus atheoretical study	No- estimation versus estimation	Good versus bad estimation	Experiment versus survey	Local sample versus nationwide sample
Involvement-Intention							
<i>r</i>			.30 vs. .17	.17 vs. .30		.30 vs. .17	
<i>Zr</i>	N/A	N/A	.32 vs. .17	.17 vs. .32	N/A	.32 vs. .17	N/A
<i>N</i> = 4			2 vs. 2	2 vs. 2		2 vs. 2	
Drug Usage-Intention							
<i>r</i>	.18 vs. .11			.21 vs. .12*	.17 vs. .10		.13 vs. .15
<i>Zr</i>	.19 vs. .11	N/A	N/A	.22 vs. .12*	.17 vs. .10	N/A	.13 vs. .15
<i>k</i> = 10	5 vs. 5			3 vs. 7	7 vs. 3		2 vs. 8
Income-Intention							
<i>r</i>			-.04 vs. .06	-.04 vs. .06	-.07 vs. .19*		.24 vs. -.05*
<i>Zr</i>	N/A	N/A	-.04 vs. .06	-.04 vs. .06	-.07 vs. .19*	N/A	.25 vs. -.05*
<i>k</i> = 8			3 vs. 5	3 vs. 5	5 vs. 3		2 vs. 6
Media Consumption-Intention							
<i>r</i>	.12 vs. .05				.12 vs. .05		
<i>Zr</i>	.12 vs. .05	N/A	N/A	N/A	.12 vs. .05	N/A	N/A
<i>k</i> = 7	1 vs. 6				1 vs. 6		
Ad Exposure-Intention							
<i>r</i>	.22 vs. .32	.22 vs. .32	.32 vs. .22	.22 vs. .32		.32 vs. .22	
<i>Zr</i>	.23 vs. .33	.23 vs. .33	.33 vs. .23	.23 vs. .33	N/A	.33 vs. .23	N/A
<i>k</i> = 10	9 vs. 1	9 vs. 1	1 vs. 9	9 vs. 1		1 vs. 9	

Note. All data are means.

k = number of correlation coefficients, *r* = mean observed correlation, *Zr* = Fisher's Z transformation

*Significant at $p < .05$

CHAPTER 5 DISCUSSION

A_{ad} is widely known to be an essential predictor of behavioral intentions. Therefore, a number of studies have addressed A_{ad} in the DTCA literature. Despite this interest in A_{ad} , there has not been a comprehensive attempt to investigate general findings across independent DTCA studies. Such an investigation is useful in “understanding the general strength and variability of the relationships and the study conditions that moderate those relationships” (Brown and Stayman 1992 p. 34). For example, while some studies have reported no evidence of a significant effect of A_{ad} on behavioral intentions (e.g., Williams and Hensel 1995), others have reported a significant effect (e.g., An 2007). Furthermore, different studies have found widely varying magnitudes of the A_{ad} effect on behavioral intentions. In order to assess the strength and variability of the A_{ad} -intention relationship, the current research meta-analyzed A_{ad} effects aggregated across all available research in the extant DTCA literature. In addition to the assessment of the relationship between A_{ad} and intentions, this study also investigated the relationships between A_{ad} and its antecedents and the potential moderating variables. The results of this meta-analysis provide considerable insight into the effects of A_{ad} in the contexts of DTCA and the state of DTCA research.

As with any meta-analysis, the data provide a quantitative summary. In the current meta-analysis, the data provided a summary of 278 samples reported in the 36 articles for which the author could obtain usable data. Variables were classified into three levels. The first level included demographic characteristics, ad awareness, involvement, health status, and drug usage. The second level contained consumers’ attitudes toward the ad. The third included behavioral intentions. The first level directly and/or indirectly affected the second and third. The second level directly influenced the third.

As shown in Tables 4-1 through 4-5 and analyzed above, the aggregated study effects suggested a significant relationship between A_{ad} and a number of important constructs, including both antecedents (education, $r = -.12$ and $Z_r = -.12$ and income, $r = -.08$, $Z_r = -.08$) and consequences (behavioral intention, $r = .19$ and $Z_r = .20$ and pharmacist intention, $r = .15$, $Z_r = .15$). In addition, the results also found that consumers' intentions were influenced by personal characteristics, including gender ($r = .02$ and $Z_r = .08$), health status ($r = -.12$ and $Z_r = -.12$), drug usage ($r = .14$ and $Z_r = .15$), and ad exposure ($r = .23$ and $Z_r = .24$). The results showed that consumers who (a) were less educated, (b) had a low income (c) were female, (d) were in bad health, (e) took a lot of drugs, or (f) were exposed to advertising frequently tended to have more favorable attitudes toward DTCA than those who (a) were more educated, (b) had a high income (c) were male, (d) were in good health, (e) took few drugs, or (f) were exposed to advertising less frequently. However, in general, the strength of each of these relationships was small or small to moderate.

Discussions and Implications

Role of Attitude toward the Ad

The results of this dissertation challenge the effect of A_{ad} on consumers' behavioral intentions in terms of DTCA. Although A_{ad} is a statistically significant predictor of consumers' intentions, it has a small to moderate effect according to Cohen's effect size interpretation guide (e.g., .1 = small, .3 = moderate, and .5 = strong). More specifically, since consumers need prescriptions to buy an advertised drug, DTCA studies have operationalized intentions in different ways (e.g., intention to request physicians to prescribe the advertised drugs, intention to ask physicians for more information about the advertised drugs, intentions to search more information about the advertised drugs, and intentions to visit a physician). Among the four

different types of intentions, patients' intentions to request prescriptions for the advertised drugs are the strongest outcome of A_{ad} , a moderate effect. A_{ad} has a small effect on the other types of intentions.

The results of the meta-analysis of the A_{ad} -intention relation in the context of DTCA have important theoretical and practical implications. Since Lutz et al. (1983) proposed the dual mediation model, which explains the A_{ad} -intention relation, many studies have tested this relation in the fields of advertising and marketing. It is worth comparing the results of the current study with those in the previous study that meta-analyzed the dual mediation model. Brown and Stayman (1992) combined the effect sizes of A_{ad} -intention relationships across independent studies. The research found that A_{ad} has a strong effect on consumers' intentions ($r = .43$), which is much stronger than that found in the current study ($r = .19$).

From the marketing and DTCA literature, four explanations for the limited effect of A_{ad} on intentions in the present study seemed plausible. First, it is possible that the operationalization of the behavioral intentions culminated in the effect size difference. Brown and Stayman's study aggregated studies that used consumers' purchase intentions in the A_{ad} -intention relation. However, since consumers do not have the final right of product purchase in prescription drug sales, "drug request intention," "drug inquiry intention," "drug information search intention," and "visit intention" are usually considered by DTCA researchers as more proper variables for the outcomes of DTCA. The present study synthesized the studies that employed drug related-behavioral intentions, not purchase intentions.

The second possible explanation of the limited DTCA effect hinges on the traditional relationships between patients and doctors. Advocates of DTCA contend that the advent of DTCA has given consumers opportunities that they have never had before. They claim that

consumers can take an active role in the treatment of their medical conditions via the knowledge consumers acquire from DTCA. However, there is a disparity between reality and expectation. For example, even though many patients have the desire to question the appropriateness of physician-prescribed decisions, some of them are unwilling to ask about the advertised prescription drugs. Patients believe that physicians may view patient inquiries or prescription requests as a sign of distrust or even disrespect (Petroshius et al. 1995). Although pharmaceutical industry advocates point to the educational value of DTCA, patients do not obtain enough medical information, either because the amount of information delivered via DTCA is limited or because the content of the medical information is difficult. Patients' limited access to medical information pertaining to various prescription drugs has culminated in patients relying heavily on the advice of their physicians to select appropriate medications. This reliance causes the patients' unwillingness to question or request prescription drugs.

Third, as mentioned previously, A_{ad} is "an affective construct representing consumers' feelings of favorability/unfavorability toward the ad itself" (MacKenzie et al. 1986, p. 130). When consumers are about to choose their medical treatment options, their involvement level is usually high. This implies that consumers rely more on careful evaluation of advertising information than on their feelings about drug advertising for the better medical decision. In other words, consumers tend to value trustworthiness/believability of the advertisement or the advertiser more than their attitudes toward the ad when they process health-related information. In addition, many have insisted for a long time that if consumers do not believe what is being said, the probability of evoking a desired response is greatly weakened (Atkin and Beltramini 2007). Thus, although the attitude-behavioral intention relation in the context of DTCA has been statistically supported, the strength of the relation is small to moderate.

Lastly, potentially, the effects of A_{ad} for different product categories are different. The results of this study revealed that the A_{ad} effect for health products is lower than that for normal consumer goods. It is possible that the lower A_{ad} effect is due to consumers' decision making processes, which are different for prescription products in general than they are for other product categories. This implies that future research should address how and why those processes are different. In addition, future research also needs to investigate to what extent A_{ad} effects are different for different product categories.

This result suggests that future research needs to develop other constructs that predict consumer behavior better than A_{ad} in the context of health-related communications and identify other possibilities that limit the A_{ad} and intention relationship. As noted previously, A_{ad} is an affective construct. A cognitive construct would be a better predictor of consumers' medical decision-making behavior. This fact implies that future researchers need to find or develop a new construct that can replace A_{ad} . In addition to developing a cognitive construct, it is also important to investigate other factors that can cause the limited effect of A_{ad} . For example, patients' accessibility to medical services is directly related to their intentions to visit a doctor's office, which is a pre-step for DTC drug prescriptions.

Such a small to moderate effect of A_{ad} on patients' intentions is the reason that drug manufacturers are questioning the efficiency of their consumer advertising (Narayanan, Desiraju and Chintagunta 2004). However, a brand's DTCA expenditure can influence product category sales (Narayanan et al. 2004). First, since the FDA allowed the DTCA of prescription drugs on television in 1997, the prescription drug market has increased by 330% from 1996 to 2005 (Donohue, Cevasco and Rosenthal 2007). Rosenthal et al. (2002) also reported noteworthy findings; they found that up to 22% of category growth could be attributed to advertising

expenditures. DTCA has been criticized for encouraging the inappropriate use of medications and for driving up drug spending. However, the criticism is evidence of the increased product category size. In addition to the influence of DTCA on product category sales, it is well-known that a brand's advertising expenditure can affect the brand's share of category sales and reduce price sensitivity, which enables pharmaceutical companies to raise drug prices.

Moreover, pharmaceutical marketers have often seen sales of advertised prescription drugs increase rapidly after the beginning of their advertisements targeting the general public (Davis 2000). After airing DTCA, Allegra and Zyrtec, for instance, experienced sales increases of 100% and 56%, respectively. Claritin, also a heavy advertiser, was the leading DTC advertiser in the first half of 1998, and during that time, its sales increased 32%. When Davis conducted his study, Claritin, Allegra, and Zyrtec were DTC drugs. After being on the market as a prescription drug for a long time and being used by a large number of people, allergy drugs were changed from DTC-to-OTC (over-the-counter) status. Consumers' tendency to request advertised drugs more than non-advertised drugs increased the sales of advertised drugs dramatically after the initiation of drug advertising. Therefore, even though a strong effect size was not detected in the A_{ad} -intention relation, pharmaceutical advertising is essential to increasing the product category size and to increasing a brand's share in the category.

It is also noteworthy that consumers' positive attitudes toward the ad lead to their intentions to ask their friends/family or pharmacists about the advertised drugs. Those relationships can be undervalued because even pharmacists cannot be involved in prescribing DTC drugs. However, if we view the relationships as an information exchange process, it is important because the communication between consumers and friends/pharmacists results in increased awareness in terms of the effects of the advertised drugs and/or common symptoms

related to the drugs. In other words, the advent of DTCA affords patients the opportunity to be better informed about their prescribed medication options. Informed patients are more likely to request prescriptions for the advertised drugs and to question the appropriateness of a physician's prescription decisions.

Role of Ad Awareness

It has been empirically proven that people have a tendency to prefer familiar objects over unfamiliar ones (e.g., Zajonc 1980). In addition to the empirical evidence, the effect of awareness can be explained by the mere exposure effect, contending that the simple repetition of ads culminates in consumers' favorable attitudes toward the ad and the advertised product. Based on the previous research and theory, it was expected that ad awareness would be an important predictor of consumers' attitudes toward the ad. In spite of the importance of the awareness effect in advertising and marketing, the comprehensive literature search found only two studies addressing the effect of ad awareness in the context of DTCA. Thus, the result of the hypothesis about the ad awareness effect on A_{ad} cannot be generalized.

Not only the ad awareness effect on A_{ad} but also its effect on consumer behavior has been investigated in the DTCA literature. Most of the studies on ad awareness effects on consumer behavior stem from Lavidge and Steiner's (1961) hierarchy-of-effect model. In the model, there are five pre-steps of purchase: awareness → knowledge → liking → preference → conviction → purchase. Many researchers have since proposed similar models that explain the consumer purchase process (e.g., Colley 1961). These hierarchy models commonly contend that ad awareness is a pre-step of the advertising goal. Based on the hierarchy models, eight studies have addressed ad awareness in terms of predicting consumer behavior. The results of the current

analyses revealed that the relationship between ad awareness and behavioral intentions is small and insignificant ($k = 8$, $r = .09$, $Z_r = .09$, $CI_{Z_r} 5\% = -.08$, and $CI_{Z_r} 95\% = .26$).

The insignificant effect of ad awareness suggests that increasing ad awareness, one of the common advertising goals, cannot lead to achieving communication breakthroughs. In advertising circles, some believe that the proliferation of products and advertisers competing for the space in the consumer's mind (e.g., ad clutter) may explain this limited effect of ad awareness. However, it is important to view DTCA in terms of health communication. As mentioned above, many factors can affect consumer response behavior to DTC drugs (e.g., rational decision-making process, physician's authority, and long-term relationship between physician and patient). Thus, it is unlikely that the previously discussed effect on the consumer's intention to ask friends/family or pharmacists about the advertised drugs has an actual influence on DTC drug sales.

Role of Antecedents of Attitude toward the Ad

According to empirical findings and theories in the DTCA literature, it was expected that consumer characteristics would be related to DTCA effectiveness. Consumer characteristics consist of demographics, involvement/health status, ad awareness/ad exposure, and health characteristics (such as health conditions and prescription drug utilization). DTCA effectiveness, including A_{ad} and behavioral intentions, were analyzed as outcomes of DTCA. The current meta-analysis identified the variables that affect consumers' attitudes toward the ad; education and income. The results revealed that gender and ethnicity were marginally significant predictors of A_{ad} . More specifically, consumers who were less educated, poor, female, and non-white were more likely to have favorable attitudes toward the ad than those who were more educated, rich, male, and white.

Another interesting finding was that consumer characteristics were directly related to behavioral intentions. For instance, consumers' higher behavioral intentions were a function of gender (female), health status (poor health condition), prescription drug utilization (high drug consumption), and frequent ad exposure. There are two implications of the results of the relationships between antecedents and intentions. First, it is noteworthy that frequent ad exposure is related to patients' behavioral intentions. It implies that advertising media planners need to focus more on frequency than on reach or other criteria related to the effect measurements of the media. Second, pharmaceutical companies can use the findings of the present study on antecedents of DTCA effects to develop market segmentation strategies. For instance, although DTCA is an effective communication tool for some consumer groups (e.g., less educated), there are also many consumers whose attitudes toward the ad are not favorable and who are not willing to request drug prescriptions or information. This means that to increase the sales of pharmaceutical products, marketers have to utilize other customized marketing tools such as drug price-off coupons for those who have unfavorable attitudes toward DTCA and low behavioral intentions.

How to spend limited advertising budgets effectively is critical for advertisers. How to save the budget is a more important task for them. The results of the analysis about the relationships among antecedents, A_{ad} , and behavioral intentions can help save the budget because the results provide guidance for audience targeting. For example, highly educated people are less reliant on DTCA information when they make a medical treatment decision. Therefore, DTCA for those consumers would be less effective than for less-educated consumers. In sum, several studies have investigated the relationships between consumer characteristics and behavioral

intentions, and the findings of the studies are valuable when developing advertising targeting strategies.

In addition to the targeting strategies, the results of the analysis about antecedents of A_{ad} can be used to develop more effective advertisements. For instance, consumers who are in bad health tend to evaluate drug ad arguments carefully, whereas those who are in good health examine the ad messages quickly or focus on simple cues. The consumer's tendency implies that the use of message framing is helpful to create persuasive messages for different consumers (e.g., good health consumers vs. bad health consumers). Message framing can be conceptualized as the perspective that people react differently to different but objectively equivalent messages (Kühberger 1998). The analogy of gambling (e.g., 50% of probability of losing money vs. 50% of probability of earning money) is a common example of message framing. The features of health-related behavior can be framed in terms of the benefits of engaging in the behavior (called a positive/gain frame), or in terms of the costs of failing to engage in the behavior (a negative/loss frame). Message framing insists that consumers prefer a positively framed message when they examine drug ad messages quickly or focus on simple cues, while they prefer a negatively framed message when they evaluate the ad arguments carefully. Thus, the results of consumer characteristics can be used to create more persuasive messages.

Limitations

In synthesizing previous studies on A_{ad} in the DTCA field, Cooper's (1989) suggestion of validity issues guided the current study. Cooper emphasized the importance of defining the objectives and scope of the meta-analytic review, searching for studies, reporting analysis procedures and results, and interpreting the results. The results and conclusions of the current study should be evaluated with Cooper's criteria of validity issues. Although the findings of the

meta-analysis provide good implications for both advertising practitioners and researchers, some limitations were unavoidable. First, the scope of the analysis assessing issues pertaining to the advertising effect was broad. A comprehensive and thorough search for relevant studies found 36 articles for which usable quantitative data were available. However, in spite of the author's efforts, data for four additional studies identified as pertinent to the topic of this study were unavailable. Thus, some differences might have resulted if the not-included studies had strong effects.

Second, the number of included empirical studies, based on the set of inclusion criteria, was limited. Even though advocates of meta-analysis proclaim it is appropriate to test effects from a limited number of studies, particular caution was used to interpret the findings of the current study. More specifically, some cells in the moderator analyses and some relationships had a very small number of study effects (as few as a single observation for the moderator analyses and two observations for relationship analyses). Limited data availability did not allow for meaningful interpretation of some relationships and the effects of moderators on pairwise relationships. Another main cause of the small number of studies included in the meta-analysis was the lack of necessary statistics for calculating effect sizes. For instance, some studies reported only statistical significance of their results without *p*-value, sample size, and other statistical values. Therefore, researchers should be mindful of reporting necessary statistics for other researchers in primary studies.

Finally, this study was limited in representing all research domains in extant pharmaceutical advertising literature because the focus was on consumer responsiveness to DTCA. In other words, it is recommended that future research address the impact of DTCA on physicians in terms of their prescription-writing habits and responsiveness to patient drug

inquiries and requests. In addition to the effect on patients, although advertising of prescription drugs (DTCA) represents 60% of the total spending on drug advertising (General Accounting Office 2002), for better understanding of the landscape of drug advertising in general, future studies need to address the role of over-the-counter drug advertising (OTCA). The unique feature of DTC drugs is that consumers cannot directly purchase prescription drugs. However, the purchase process for OTC drugs is different from that of DTC drugs. Thus, it would be interesting to compare the effect of OTCA on behavioral intentions with that of DTCA or the results of Brown and Stayman's study.

Summary

Researchers have devoted considerable attention to the investigation of consumers' attitudes toward the ad and their effect on consumer behavior. The impact of this well-known predisposition has been tested in the context of DTCA, and it appears to be mixed. The current study is the first attempt to investigate the effect of DTCA across independent DTCA studies with a meta-analytic approach. Two primary conclusions can be drawn from this meta-analysis. The results from the current meta-analysis suggest that A_{ad} is a statistically significant predictor of behavioral intentions, but that A_{ad} has a small to moderate effect size in terms of affecting consumers' intentions. This study also found that some demographic factors are related to consumers' attitudes toward the ad. Although moderator analyses were conducted to clarify further the strength of each pairwise relationship studied, consistent patterns were not detected. Gaining a greater understanding of the relationships surrounding A_{ad} has implications for researchers and practitioners.

APPENDIX A
CODED CHARACTERISTICS OF INCLUDED STUDIES

Study	Primary author's discipline	Student or Nonstudent sample	Single or multiple scales	Theoretical foundation yes or no	Sample size	Effect size estimation	Study design	Sample collection
Lee et al. (2007)	Advertising	Nonstudent	Single	Yes	2141	No estimation	Survey	Nationwide sample
Choi & Lee (2007)	Advertising	Nonstudent	Single	No	1301	Estimation	Survey	Nationwide sample
Everett (1991)	Communication	Nonstudent	Single	No	238	Estimation	Survey	Local-sample
Mehta & Purvis (2003)	Other	Nonstudent	Single	No	1475	Estimation	Survey	Nationwide sample
Wilson & Till (2007)	Communication	Nonstudent	Multiple	No	2290	No estimation	Survey	Nationwide sample
Deshpande et al. (2004)	Medical	Nonstudent	Multiple	Yes	382	No estimation	Survey	Nationwide sample
Huh et al. (2005)	Communication	Student	Single	No	353	Estimation	Survey	Local-sample
Huh & Becker (2005)	Communication	Student	Multiple	No	688	No estimation	Survey	Nationwide sample
Atkin & Beltramini (2007)	Marketing	Nonstudent	Multiple	No	93	Estimation	Survey	Local-sample
Hausman (2008)	Marketing	Nonstudent	Single	No	455	No estimation	Survey	Local-sample
An (2007)	Communication	Nonstudent	Single	Yes	189	Estimation	Survey	Local-sample
Huh & Lanteau (2009)	Communication	Nonstudent	Single	Yes	644	Estimation	Survey	Nationwide sample
Kavadas et al. (2007)	Marketing	Nonstudent	Single	Yes	156	Estimation	Experiment	Local-sample

Study	Primary author's discipline	Student or Nonstudent sample	Single or multiple scales	Theoretical foundation yes or no	Sample size	Effect size estimation	Study design	Sample collection
Beltramini (2006)	Marketing	Nonstudent	Single	No	2653	No estimation	Survey	Nationwide sample
Joseph et al.(2008)	Marketing	Nonstudent	Single	No	168	Estimation	Survey	Nationwide sample
Bell et al. (1999)	Communication	Nonstudent	Single	No	329	No estimation	Survey	Local-sample
Spake & Joseph (2007)	Marketing	Nonstudent	Single	No	154	Estimation	Survey	Local-sample
Singh & Smith (2007)	Marketing	Nonstudent	Single	Yes	288	Estimation	Survey	Nationwide sample
Limbu & Torres (2009)	Marketing	Nonstudent	Mutiple	Yes	186	Estimation	Experiment	Local-sample
Perri & Nelson (1987)	Marketing	Nonstudent	Mutiple	No	139	Estimation	Survey	Local-sample
Williams & Hensel (1995)	Marketing	Nonstudent	Mutiple	Yes	132	No estimation	Survey	Local-sample
Baca et al. (2005)	Marketing	Student	Mutiple	Yes	205	Estimation	Survey	Local-sample
Gonul et al. (2000)	Marketing	Nonstudent	Mutiple	No	318	Estimation	Survey	Nationwide sample
Liu et al. (2005)	Medical	Nonstudent	Mutiple	Yes	375	Estimation	Survey	Nationwide sample
Parnes et al. (2009)	Medical	Nonstudent	Single	No	1647	Estimation	Survey	Local-sample
Rehne & Moldrup (2008)	Medical	Nonstudent	Single	No	3001	Estimation	Survey	Local-sample
Morris et al. (1986)	Other	Nonstudent	Single	No	1507	Estimation	Survey	Local-sample

Study	Primary author's discipline	Student or Nonstudent sample	Single or multiple scales	Theoretical foundation yes or no	Sample size	Effect size estimation	Study design	Sample collection
Sumpradit et al. (2002)	Medical	Nonstudent	Single	Yes	342	Estimation	Survey	Local-sample
Schommer et al. (2005)	Medical	Nonstudent	Single	No	80	Estimation	Survey	Nationwide sample
Weissman (2003)	Medical	Nonstudent	Mutiple	No	1022	Estimation	Survey	Local-sample
Maddox(1999)	Marketing	Nonstudent	Single	No	132	Estimation	Survey	Local-sample
Herzenstein et al. (2004)	Marketing	Nonstudent	Single	No	960	Estimation	Survey	Local-sample
Abel et al. (2009)	Medical	Nonstudent	Single	No	348	Estimation	Survey	Nationwide sample
Bhutada et al. (2009)	Medical	Nonstudent	Mutiple	Yes	138	Estimation	Experiment	Nationwide sample
Delorme et al. (2010)	Communication	Nonstudent	Mutiple	No	235	Estimation	Survey	Nationwide sample
Yang et al. (2010)	Medical	Nonstudent	Single	Yes	150	Estimation	Survey	Nationwide sample

APPENDIX B
OTHER CHARACTERISTICS OF INCLUDED STUDIES

Study	Name of Journal	# of Authors	# of Relations Reported	Dominant Ethnic Group of Sample	Dominant Gender of Sample	Relationships Investigated
Lee et al. (2007)	Journal of Advertising	3	46	White	Female	6, 7, 8, 9, 10, 15, 24, 26, 42, 43, 60, 61, 44, 62, 63, 45, 64, 50, 67
Choi & Lee (2007)	Journal of Advertising	2	6	White	Female	24, 26, 42, 60
Everett (1991)	Journal of Advertising Research	1	6	N/A	N/A	16, 18, 21, 36, 63
Mehta & Purvis (2003)	Journal of Advertising Research	2	6	N/A	Female	16, 17, 33, 39, 42, 49
Wilson & Till (2007)	Journal of Advertising Research	2	6	White	Female	24, 42, 45, 46, 47
Deshpande et al. (2004)	Journal of Health Communication	3	8	White	Female	7, 10, 23, 26, 69, 70, 71
Huh et al. (2005)	Journal of Health Communication	3	10	White	Female	25, 26, 28, 54, 55, 57, 66, 92, 93
Huh & Becker (2005)	International Journal of Advertising	2	65	White	Female	6, 7, 8, 9, 10, 12, 14, 25, 26, 52, 53, 54, 55, 60, 61, 62, 68, 72, 73, 74, 75, 76, 77, 78, 79, 80, 87, 88, 89, 90, 91
Atkin & Beltramini (2007)	Journal of Marketing Communications	2	1	N/A	Male	12
Hausman (2008)	Journal of Advertising Research	1	1	White	Female	22
An (2007)	Journal of Health Communication	1	6	N/A	Female	23, 24, 94, 95, 96, 97
Huh & Lanteau (2009)	Communication Research	2	1	N/A	Female	95
Kavadas et al. (2007)	Journal of Consumer Marketing	3	4	N/A	Female	5, 11, 31, 81

Study	Name of Journal	# of Authors	# of Relations Reported	Dominant Ethnic Group of Sample	Dominant Gender of Sample	Relationships Investigated
Beltramini (2006)	Journal of Business Ethics	1	6	N/A	N/A	23, 24, 26
Joseph et al. (2008)	International Journal of Pharmaceutical and Healthcare Marketing	3	6	N/A	Female	60, 61, 67
Bell et al. (1999)	Journal of General Internal Medicine	3	4	White	Female	1, 2, 4, 13
Spake & Joseph (2007)	Journal of Consumer Marketing	2	2	N/A	Male	23, 26
Singh & Smith (2007)	Journal of Consumer Marketing	2	2	N/A	Female	26
Limbu & Torres (2009)	Journal of Health and Human Services Administration	2	4	N/A	N/A	11, 31, 38, 86
Perri & Nelson (1987)	Journal of Health Care Marketing	2	1	N/A	Female	13
Williams & Hensel (1995)	Journal of Health Care Marketing	2	5	N/A	N/A	9, 10, 24, 28, 29
Baca et al. (2005)	Journal of Consumer Marketing	3	4	N/A	N/A	6, 10, 14, 24
Gonul et al. (2000)	Health Care Management Science	3	9	N/A	N/A	6, 9, 10, 14, 15, 26, 28, 29, 30
Liu et al. (2005)	Research in Social Administrative Pharmacy	4	15	White	Female	24, 25, 28, 42, 43, 44, 45, 52, 53, 54, 55, 82, 83, 84, 85
Parnes et al. (2009)	Annals of Family Medicine	7	3	No dominant group	Female	33, 35, 39
Rehne & Moldrup (2008)	Journal of Medical Marketing	2	4	N/A	N/A	1, 2, 10, 14
Morris et al. (1986)	Public Health Reports	5	1	White	Female	9

Study	Name of Journal	# of Authors	# of Relations Reported	Dominant Ethnic Group of Sample	Dominant Gender of Sample	Relationships Investigated
Sumpradit et al. (2002)	American Journal of Health Behavior	3	2	N/A	Female	23
Schommer et al. (2005)	Research in Social and Administrative Pharmacy	3	18	N/A	Male	23, 24, 33, 34, 36, 37, 41, 42, 43, 46, 50, 51
Weissman (2003)	Health Affairs	1	2	White	N/A	18, 64
Maddox (1999)	Journal of Product and Brand Management	1	2	N/A	Male	33, 42
Herzenstein et al. (2004)	Marketing Letters	3	7	N/A	N/A	24, 25, 39, 49, 52, 55, 58
Abel et al. (2009)	Journal of Clinical Oncology	4	5	White	N/A	1, 2, 3, 4, 5
Bhutada et al. (2009)	Health Marketing Quarterly	3	6	White	Male	11, 12, 31, 32, 47, 48
Delorme et al. (2010)	Journal of Health Communication	3	2	White	Female	8
Yang et al. (2010)	Journal of the National Medical Association	7	3	Black	Female	16, 18, 20

Note.

Numbers in relationships investigated represents the following relationships:

1. age-Ad awareness
2. gender-Ad awareness
3. ethnicity-Ad awareness
4. education-Ad awareness
5. health status- Ad awareness
6. age-A_{ad}
7. gender-A_{ad}
8. ethnicity-A_{ad}
9. education-A_{ad}
10. health status-A_{ad}
11. involvement-A_{ad}
12. ad exposure-A_{ad}
13. ad awareness-A_{ad}
14. drug use-A_{ad}
15. income-A_{ad}
16. Ad awareness-Intention to request the advertised drugs
17. Ad awareness-Intention to ask more info about the advertised drugs
18. Ad awareness-Intention to discuss with physicians
19. Ad awareness-Intention to tell their doctor they had seen the ad
20. Ad awareness-screening test participation

21. Ad awareness-intention to change doctors if request refused
22. A_{ad}-brand attitude
23. A_{ad}-Intention to request the advertised drugs
24. A_{ad}-Intention to ask doctors more info about the advertised drugs
25. A_{ad}-Intentions to find more info
26. A_{ad}-Intention to discuss with physicians
27. A_{ad}-Intention to tell their doctor they had seen the ad
28. A_{ad}-Intention to ask pharmacists more info about the advertised drugs
29. A_{ad}-Intention to ask friends more info about the advertised drugs
30. A_{ad}-Intention to ask nurses more info about the advertised drugs
31. involvement-brand attitude
32. ad exposure-brand attitude
33. age-Intention to request the advertised drugs
34. gender-Intention to request the advertised drugs
35. ethnicity-Intention to request the advertised drugs
36. education-Intention to request the advertised drugs
37. health status-Intention to request the advertised drugs
38. involvement-Intention to request the advertised drugs
39. drug use-Intention to request the advertised drugs
40. income-Intention to request the advertised drugs
41. media consumption-Intention to request the advertised drugs
42. age-Intention to ask more info about the advertised drugs
43. gender-Intention to ask more info about the advertised drugs
44. ethnicity-Intention to ask more info about the advertised drugs
45. education-Intention to ask more info about the advertised drugs
46. health status-Intention to ask more info about the advertised drugs
47. involvement-Intention to ask more info about the advertised drugs
48. ad exposure-Intention to ask more info about the advertised drugs
49. drug use-Intention to ask more info about the advertised drugs
50. income-Intention to ask more info about the advertised drugs
51. media consumption-Intention to ask more info about the advertised drugs

52. age-Intentions to find more info
53. gender-Intentions to find more info
54. ethnicity-Intentions to find more info
55. education-Intentions to find more info
56. health status-Intentions to find more info
57. drug use-Intentions to find more info
58. income-Intentions to find more info
59. ad exposure-Intentions to find more info
60. age-Intention to discuss with physicians
61. gender-Intention to discuss with physicians
62. ethnicity-Intention to discuss with physicians
63. education-Intention to discuss with physicians
64. health status-Intention to discuss with physicians
65. media consumption-Intention to discuss with physicians
66. drug use-Intention to discuss with physicians
67. income-Intention to discuss with physicians
68. ad exposure-Intention to discuss with physicians
69. ad clarity-Aad 70. quality of ad info-Aad 71. quality of risk info-Aad
72. age-ad exposure 73. gender-ad exposure 74. ethnicity-ad exposure
75. education-ad exposure 76. health status-ad exposure
77. drug use-ad exposure 78. gender-drug use 79. ethnicity-drug use
80. education-drug use 81. health status-involvement
82. age-Intention to ask pharmacists more info about the advertised drugs
83. gender-Intention to ask pharmacists more info about the advertised drugs
84. ethnicity-Intention to ask pharmacists more info about the advertised drugs
85. education-Intention to ask pharmacists more info about the advertised drugs
86. involvement-price perception 87. age-health status 88. gender-health status
89. ethnicity-health status 90. education-health status 91. age-drug use
92. gender-Intention to ask friends more info about the advertised drugs
93. drug use-Intention to ask friends more info about the advertised drugs
94. interest in health info-Intention to request the advertised drugs

95. drug knowledge-Intention to request the advertised drugs
96. interest in health info-Intention to ask doctors more info about the advertised drugs
97. drug knowledge-Intention to ask doctors more info about the advertised drugs

APPENDIX C
CODING MANUAL AND FORMS

- | | |
|--|--------------------|
| 1. Study ID number. Assign a unique identification number to each study. If a report presents two independent studies, i.e., two independent outcome studies with different participants, then add a decimal to the study ID number to distinguish each study within a report and code each independent study. | [ID] |
| 2. Coder | [CODER] |
| 1. Primary coder | 2. Secondary coder |
| 3. Primary author (LN, FI) | [AUTHOR] |
| 4. Primary author affiliation: | [AUTHAFF] |
| 5. Primary author's discipline | [AUTHDISC] |
| 1. Advertising | |
| 2. Marketing/Business | |
| 3. Communication (including health communication) | |
| 4. Medical | |
| 5. Health marketing | |
| 6. Other (specify): | |
| 9. Cannot tell | |
| 6. Bibliographic info in APA format: | [REF] |
-
- | | |
|---|---------------------|
| 7. Year of publication _ _ _ _ (9999 if unknown) | [PUBYR] |
| 8. Name of journal: | [NAMEJOU] |
| 9. Journal ranking: Impact factor of the Journal if readily available. Impact factors were taken from Journal Citation reports – Social Sciences & General Science Editions (2004). | [JOURANKING] |
| 10. Field of publication | [PUBFIELD] |
| 1. Advertising | 4. Medical |
| 2. Marketing | 5. Health marketing |
| 3. Communication | 6. Other (specify): |

11. Where was this study conducted? [SITE]

- | | |
|----------------|----------------|
| 1. U.S | 3. Other: |
| 2. New Zealand | 9. Cannot tell |

Sample Descriptors

1. Mean age of sample. Specify the approximate or exact mean age. Code the best information available; estimate mean age from grade levels if necessary. If mean age cannot be determined, enter "99.99." [AGE]

2. Predominant race. Select the code that best describes the racial makeup of the sample.

- | | |
|------------------------------------|--------------------------------------|
| 1. Greater than 60% White | 5. Mixed, none more than 60% |
| 2. Greater than 60% Black | 6. Mixed, cannot estimate proportion |
| 3. Greater than 60% Hispanic | 9. Cannot tell |
| 4. Greater than 60% other minority | [RACE] |

3. Predominant sex of sample. Select the code that best describes the proportion of males in the sample. [GENDER1]

- | | |
|----------------------------|-----------------------------|
| 1. Less than 5% male | 4. Between 51% and 95% male |
| 2. Between 5% and 49% male | 5. Greater than 95% male |
| 3. 50% male | 9. Cannot tell |

4. Actual proportion of males in the sample: If the proportion cannot be determined, enter "99.99" [GENDER2]

5. Use of student sample. Select the code that best describes the sample characteristic.

- | | |
|-----------------------|----------------|
| 1. Student sample | 9. Cannot tell |
| 2. Non-student sample | [STUDENT] |

6. Predominant education level. Select the code that best describes the proportion of college and higher level in the sample. [EDU]

- | | |
|-----------------------|------------------------|
| 1. Less than 5% | 4. Between 51% and 95% |
| 2. Between 5% and 49% | 5. Greater than 95% |
| 3. 50% | 9. Cannot tell |

7. Predominant income level. Select the code that best describe the proportions of \$50,000 and higher income bracket in the sample. [INCOME]

- | | |
|-----------------|------------------------|
| 1. Less than 5% | 4. Between 51% and 95% |
|-----------------|------------------------|

- 2. Between 5% and 49%
- 3. 50%
- 5. Greater than 95%
- 9. Cannot tell

8. Other participant characteristics and value. Describe other sample descriptor not coded above.

[OTHERCHAR]

Effect Size

For each effect size, code all of the following items. Note that studies will have different numbers of effect sizes, and hence, different numbers of effect size level data coding forms.

- 1. Study ID: [ID]
- 2. Effect size number. Assign each ES within a study a unique number and name. Multiple effect sizes are numbered sequentially, e.g., 1, 2, 3, 4, etc. [ESID]

Code for Constructs

- 3. Dependent Variable (Construct measured) [DV]

- 1. Ad awareness
- 2. Attitude toward the ad
- 3. Attitude toward the brand
- 4. Intention to request the advertised drugs
- 5. Intention to ask doctors more info about the advertised drugs
- 6. Intentions to find more info
- 7. Intention to discuss with physicians
- 8. Intention to visit their physicians
- 9. Intention to ask pharmacists more info about the advertised drugs
- 10. Intention to ask friends more info about the advertised drugs
- 11. Intention to ask nurses more info about the advertised drugs
- 12. Drug use
- 13. Health status
- 14. Ad exposure
- 15. Other

- 4. Number of scale item to measure DV [SCALEDV]

- 1. Single-item
- 2. Multi-item
- 9. Cannot determine or not reported

5. Independent Variable (Construct measured) [IV]
1. Age
 2. Gender
 3. Ethnicity
 4. Education
 5. Health status
 6. Involvement
 7. Ad exposure
 8. Media time consumption
 9. Ad awareness
 10. Attitude toward the ad
 11. Attitude toward the brand
 12. Other:
 13. Drug use
 14. Income
 15. Drug knowledge
6. Number of scale item to measure IV [SCALEIV]
1. Single-item
 2. Multi-item
 9. Cannot determine or not reported
7. Reliability and validity provided? [RELVAL]
1. Yes
 2. No
 9. Cannot tell
8. Type of measure. What are the constructs measured? [MEASURE]
1. Behavioral observation/observational measure
 2. Rating scale/checklist/questionnaire
 3. Standardized test
 4. Direct assessment
 5. Other: _____
 9. Cannot tell
9. Focus of measure. What is the focus of the article that the author(s) is(are) interested in?
1. Attitude toward the ad
 2. Attitude toward the brand
 3. Behavioral intention
 4. Other: _____
 9. Cannot tell
- [FOCUS]
10. Theoretical foundation. Is the article based on a specific theory? [THEOFFOUND]
1. Yes
 2. No
 9. Cannot tell

11. If yes, specify the theory employed: [THEORY]
12. Types of relationship. Variable types in the pairwise relationships. [RELATION]
1. Two dichotomous variables
 2. A dichotomous and continuous variables
 3. Two continuous variables
- Codes for Effect size
13. Statistical-value for the pairwise relationship: [STATVALUE]
14. Types of statistical value for the relationship. [STATUSED]
1. Chi-square
 2. F
 3. Z
 4. r
 5. t
 6. P-value
 7. other
15. Effect size. Calculate effect size using the excel effect size determination program or by hand using the procedures outlined in Table 3-2: [ES]
16. Statistical significance of the pairwise relationship [SIGNIFICANCE]
1. Yes
 2. No
 9. Cannot tell
17. Confidence rating in effect size computation. [ESTIMATION]
1. highly estimated (have N and crude p-value only, such as $p < .01$, and must reconstruct via rough t-test equivalence)
 2. moderate estimation (have complex but relatively complete statistics, such as multifactor ANOVA, as basis for estimation)
 3. some estimation (have unconventional statistics and must convert to equivalent t-values or have conventional statistics but incomplete, such as exact p-value).
 4. slight estimation (must use significance testing statistics rather than descriptive statistics, but have complete statistics of conventional sort)
 5. no estimation (have descriptive data such as means, standard deviations, frequencies, proportions, etc. and can calculate the effect size directly)

Methodological Feature

- | | | |
|--|----------------|--------------|
| 1. Type of design | | [DESIGN] |
| 1. Experiment | 4. Econometric | |
| 2. Quasi-experiment | 5. Other: | |
| 3. Survey | | |
| 2. If a study is a survey. Survey sample collecting method | | [SURVEY] |
| 1. Phone | | |
| 2. Mail | | |
| 3. Paper-pencil | | |
| 4. online | | |
| 3. Survey sampling | | [SURSAMP] |
| 1. Stratified random | | |
| 2. Random | | |
| 3. Convenience sample | | |
| 4. Probability sample | | |
| 4. Sampling place | | [SAMPPLACE] |
| 1. Local | | |
| 2. Nationwide | | |
| 3. Foreign | | |
| 5. Response rate | | [RESRATE] |
| Cannot, enter 1000 | | |
| 6. Method of assignment to experimental groups | | [ASSIGNMETH] |
| 1. Random | | |
| 2. Non-random | | |
| 3. Other: _____ | | |
| 9. Cannot determine | | |
| 7. Study funding | | [FUNDING] |
| 1. Government funding | | |
| 2. Private funding | | |
| 3. No-funding | | |
| 4. Partial funding | | |

9. Cannot determine

8. Study setting

[STUDYSETTING]

1. Lab

2. Field

3. Hybrid

9. Cannot determine

9. Product name and category (inductively identified): _____

[PRODUCTCATE]

10. Experimental study stimulus

[STIMULUS]

1. Print

2. Audio

3. Visual

4. Audio+visual

5. Other

9. Cannot determine or no reported

LIST OF REFERENCES

- Aaker, David A. and George S. Day (1974), "A Dynamic Model of Relationships among Advertising, Consumer Awareness, Attitude, and Behavior," *Journal of Applied Psychology*, 59 (3), 281-286
- Alperstein, Neil M. and Mark Peyrot (1993), "Consumer Awareness of Prescription Drug Advertising," *Journal of Advertising Research*, July/August, 50-56
- An, Soontae (2008), "Antidepressant Direct-to-Consumer Advertising and Social Perception of the Prevalence of Depression: Application of the Availability Heuristic," *Health Communication*, 23(6), 499-505.
- _____ (2007), "Attitude toward Direct-to-Consumer Advertising and Drug Inquiry Intention: The Moderating Role of Perceived Knowledge," *Journal of Health Communication*, 12(6), 567-580
- Anderson, Craig A., and Brad J. Bushman (2001), "Effects of Violent Video Games on Aggressive Behavior, Aggressive Cognition, Aggressive Affect, Physiological Arousal, and Prosocial Behavior: A Meta-Analytic Review of the Scientific Literature," *Psychological Science*, 12, 353-359
- Ankem, Kalyani (2005), "Approaches to Meta-Analysis: A Guide for LIS Researchers," *Library and Information Science Research*, 27 (2), 164-176
- Atkin, Joann L. and Richard F. Beltramini (2007), "Exploring the Perceived Believability of DTC Advertising in the US," *Journal of Marketing Communications*, 13 (3), 169-180
- Baca, Erin E., Juan Holguin Jr., and Andreas W. Stratemeyer (2005), "Direct-to-Consumer Advertising and Young Consumers: Building Brand Value," *Journal of Consumer Marketing*, 22 (7), 379-387
- Bansal, Harvir S. and Shirley F. Taylor (2002), "Investigating Interaction Effects in the Theory of Planned Behavior in a Service-Provider Switching Context," *Psychology & Marketing*, 19 (5), 407-425
- Baron, Reuben M. and David A. Kenny (1986), "The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations," *Journal of Personality and Social Psychology*, 51 (6), 1173-1183
- Bell, Robert A., Michael S. Wilkes, Richard L. Kravitz (1999), "Advertisement-Induced Prescription Drug Requests Patients' Anticipated Reactions to a Physician who Refuses," *Journal of Family Practice*, 48 (6), 446-452
- Berger, Jeffrey T., Pieter Kark, Fred Rosner, Samuel Packer and Allen J. Bennett (2001), "Direct-to-Consumer Drug Marketing," *Mount Sinai Journal of Medicine*, 68 (3), 197-202

- Berndt, Ernest (2001), "The U.S. Pharmaceutical Industry: Why Significant Growth in Times of Cost Containment?" *Health Affairs*, 20 (2), 100-114
- Bornstein, Robert F. (1989), "Exposure and Affect: Overview and Meta-Analysis of Research, 1968-1987," *Psychological Bulletin*, 106 (2), 265-289
- Bradley, Lynette, R. and Julie Magno Zito (1997), "Direct-to-Consumer Prescription Drug Advertising," *Medical Care*, 35 (1), 86-92
- Brett, Allen S. (2007), "Direct-to-consumer advertising of prescription drugs," *Journal of Watch General Medicine*, 357, 673-681
- Brown, Steven P. and Douglas M. Stayman (1992), "Antecedents and Consequences of Attitude toward the Ad: A Meta-analysis," *Journal of Consumer Research*, 19 (June), 34-51
- Brownfield, Erica D., Jay M. Bernhardt, Jennifer L. Phan, Mark V. Williams, Ruth M. Parker (2004), "Direct-to-Consumer Drug Advertisements on Network Television: An Exploration of Quantity, Frequency, and Placement," *Journal of Health Communication*, 9, 491-497
- Bush, Alan J., Rachel Smith, and Craig Martin (1999), "The Influence of Consumer Socialization Variables on Attitudes Toward Advertising: A Comparison of African-Americans and Caucasians," *Journal of Advertising*, 28 (3), 13-24
- Bushman, Brad J., and Craig A. Anderson (2001), "Media Violence and the American Public: Scientific Fact versus Media Misinformation," *American Psychologist*, 56, 477-489
- Calder, Bobby J., Lynn W. Phillips, and Alice M. Tybout (1981), "Designing Research for Application," *Journal of Consumer Research*, 8 (September), 197-207
- Calfee, John E. (2002), "Public Policy Issues in Direct-to-Consumer Advertising of Prescription Drugs," *Journal of Public Policy & Marketing*, 21 (2), 174-193
- Campbell, Margaret C., and Kevin L. Keller (2003), "Brand Familiarity and Advertising Repetition Effects," *Journal of Consumer Research*, 30, 292-304
- Capella, Michael L. (2005), "A Review of the Effect of Advertising on Cigarette Initiation, Continuation and Brand Behavior: A Mixed Method Approach," a dissertation for the degree of doctor of philosophy in marketing, Mississippi State University, Mississippi
- Celsi, Richard L., and Jerry C. Olson (1988), "The Role of Involvement in Attention and Comprehension Processes," *The Journal of Consumer Research*, 15(2), 210-224
- Chaiken, Shelly and Alice H. Eagly (1983), "Communication Modality as a Determinant of Persuasion: The Role of Communicator Salience," *Journal of Personality and Social Psychology*, 45 (20), 241-256

- Choi, Sejung M. and Wei-Na Lee (2007), "Understanding the Impact of Direct-to-Consumer (DTC) Pharmaceutical Advertising on Patient-Physician Interaction," *Journal of Advertising*, 36 (3), 137-149
- Colley, Russel H. (1961), *Defining Advertising Goals for Measured Advertising Results*, New York, NY: Association of National Advertisers
- Deshpande, Aparna, Ajit Menon, Matthew Perri III, and George Zinkhan (2004), "Direct-to-Consumer Advertising and its Utility in Health Care Decision Making: A Consumer Perspective," *Journal of Health Communication*, 9, 499-513
- Donohue, J. M., Berndt, E. R., Rosenthal, M. B., Epstein, A. M., and Frank, R. G. (2004). Effects of pharmaceutical promotion on adherence to the treatment guidelines for depression. *Medical Care*, 42(12), 1176-1185
- _____, Marisa Cevasco, and Meredith B. Rosenthal (2007), "A Decade of Direct-to-Consumer Advertising of Prescription Drugs," *New England Journal of Medicine*, 357 (7), 673-681
- Everett, Stephen E. (1991), "Lay Audience Response to Prescription Drug Advertising," *Journal of Advertising Research*, 31 (2), 43-49
- Farley, John U., and Donald R. Lehmann (1986), *Meta-Analysis in Marketing: Generalization of Response Models*. Lexington, MA: Lexington Books
- Federal Register 33 (1968): 8812
- Federal Register 44 (1979): 40016
- Fern, Edward F. and Kent B. Monroe (1996), "Effect-Size Estimates: Issues and Problems in Interpretation," *Journal of Consumer Research*, 23 (September), 89-105
- Field, Andy P. (2001), "Meta-Analysis of Correlation Coefficients: A Monte Carlo Comparison of Fixed- and Random-Effects Methods," *Psychological Methods*, 6 (2), 161-180
- Food and Drug Administration (1997), Center for Drug Evaluation and Research, "Draft Guidance for Industry on Consumer-directed Broadcast Advertisements," (July 1997), *Federal Register*, 62 (155), 43171-73
- _____, (1999), Center for Drug Evaluation and Research, "Guidance for Industry: Consumer-directed Broadcast Advertisements," (August 1999), *Federal Register*, 64 (152), 43197-98
- General Accounting Office. (2002). *Prescription Drugs: FDA Oversight of Direct-to-Consumer Advertising Has Limitations*. Washington, DC: United States General Accounting Office
- Glass, Gene V. (1976), "Primary, Secondary, and Meta-Analysis of Research," *Educational Researcher*, 5 (10), 3-8

- Green, William (1995), "Consumer-Directed Advertising of Contraceptive Drugs: The FDA, Depo-Provera, and Product Liability," *Food and Drug Law Journal*, 50, 553-568
- Haley, Russel I. and Allan L. Baldinger (1991), "The ARF Copy Research Validity Project," *Journal of Advertising Research*, 31 (April/May), 11-32
- Harris, Richard J. (1983), *Information Processing Research in Advertising*, Hillsdale, NJ: Lawrence Erlbaum Associates
- Hausman, Angela (2008), "Direct-to-Consumer Advertising and Its Effect on Prescription Request," *Journal of Advertising Research*, 48 (1), 42-56
- Hedges, Lawrence V. and Ingram Olkin (1985), *Statistical Methods for Meta-analysis*, Orlando, FL: Academic Press
- _____ (1992), "Meta-Analysis," *Journal of Educational Statistics*, 17 (4), 279-296
- _____ & Vevea, J. L. (1998), "Fixed- and Random-Effects Models in Meta-Analysis," *Psychological Methods*, 3, 486-504
- Herzenstein, Michal, Sanjog Misra, and Steven S. Posavac (2004), "How Consumers' Attitude Toward Direct-to-Consumer Advertising of Prescription Drugs Influence Ad Effectiveness, and Consumer and Physician Behavior," *Marketing Letters*, 15 (4), 201-212
- Hoek, Janet and Philip Gendall (2002), "To Have or Not to Have? Ethics and Regulation of Direct to Consumer Advertising of Prescription Medicines," *Journal of Marketing Communications*, 8, 1-15
- Hoen, E. (1998), "Direct-to-Consumer Advertising: For Better Profits or For Better Health?" *American Journal of Health-System Pharmacy*, 55, 594-597
- Homer, Pamela M. (1990), "The Mediating Role of Attitude Toward the Ad: Some Additional Evidence," *Journal of Marketing Research*, 27 (February), 78-86
- Huh, Jisu and Lee B. Becker (2004), "Direct-to-consumer prescription drug advertising: understanding its consequences," *International Journal of Advertising*, 24 (4), 441-466
- _____, Denise E. Delorme, Leonard N. Reid (2004), "The Third-Person Effect and Its Influence on Behavioral Outcomes in a Product Advertising Context: The Case of Direct-to-Consumer Prescription Drug Advertising," *Communication Research*, 31 (5), 568-599
- Hunter, John E. and Frank L. Schmidt (1990), *Methods of Meta-analysis: Correcting Error and Bias in Research Findings*, Newbury Park, CA: Sage
- _____, _____, and G. E. Jackson (1982), *Meta-Analysis: Cumulating Research Findings across Studies*. Beverly Hills, CA: Sage Publications.

- Iizuka, Toshiaki (2004), "What Explains the Use of Direct-to-Consumer Advertising of Prescription Drugs?" *Journal of Industrial Economics*, 52 (3), 349-379
- Janiszewski, Chris (1993), "Preattentive Mere Exposure Effects," *Journal of Consumer Research*, 20(3), 376-392
- _____, Hayden Noel, and Alan G. Sawyer (2003), "A Meta-analysis of the Spacing Effect in Verbal Learning: Implications for Research on Advertising Repetition and Consumer Memory," *Journal of Consumer Research*, 30 (June), 138-149
- Johnson, Blair T. and Alice H. Eagly (1989), "Effects of Involvement on Persuasion: A Meta-analysis," *Psychological Bulletin*, 106 (2), 290-314
- Jung, Wan S., Jihye Kim, and Eun Soo Rhee (2010), "Three Decades of Direct-to-Consumer Advertising of Prescription Drugs," Will be presented at to the annual conference of AEJMC, Denver, CO, August, 2010
- Kaiser Family Foundation (2010), "Prescription Drug Fact Sheet," (assessed April 23, 2011), available at <http://www.kff.org/rxdrugs/upload/3057-08.pdf>
- Kaphingst, Kimberly A., William Dejong, Rima E. Rudd, and Lawren H. Darltroy (2004), "A Content Analysis of Direct-to-Consumer Television Prescription Drug Advertisements," *Journal of Health Communication*, 9, 515-528
- Keller, Kevin L. (2002), *Strategic Brand Management: Building, Measuring, and Managing Brand Equity* (2 ed.). Upper Saddle, River, NJ: Prentice Hall
- Kraus, Stephen J. (1995), "Attitudes and the Prediction of Behavior: A Meta-Analysis of the Empirical Literature," *Personality and Social Psychology Bulletin*, 21 (1), 58-75
- Kravitz, Richard L., Ronald M. Epstein, Mitchell D. Feldman, Carol E. Franz, Rahman Azari, Michael S. Wilkes, Ladson Hinton, and Peter Franks (2005), "Influence of Patients' Requests for Direct-to-Consumer Advertised Antidepressants: A Randomized Controlled Trial," *Journal of American Medical Association*, 293(16), 1995-2002
- Lavidge, Robert J. and Gary A. Steiner (1961), "A Model for Predictive Measurements of Advertising Effectiveness," *Journal of Marketing*, 25 (6), 59-62
- Leffler, Keith B. (1981), "Persuasion or Information? The Economics of Prescription Drug Advertising," *Journal of Law and Economics*, 24 (1), 45-74
- Lipsey, Mark W. and David B. Wilson (2001), *Practical Meta-Analysis* (1 ed.). CA: Sage Publications, Inc.
- Lipsky, MS and CA Taylor (1997), "The Opinions and Experiences of Family Physicians Regarding Direct-to-Consumer Advertising," *Journal of Family Practice*, 45 (6), 495-499

- MacKenzie, Scott B. and Richard J. Lutz (1989), "A Empirical Examination of the Structural Antecedents of Attitude toward the Ad in an Advertising Pretesting Context," *Journal of Marketing*, 53 (April), 48-65
- _____, Richard J. Lutz, and George E. Belch (1986), "The Role of Attitude toward the Ad as a Mediator of Advertising Effectiveness: A Test of Competing Explanations," *Journal of Marketing Research*, 23 (May), 130-143
- Martin, Mary C. (1997), "Children's Understanding of the Intent of Advertising: A Meta-Analysis," *Journal of Public Policy & Marketing*, 16(2), 205-216
- McGuire, William J. (1978), An Information Processing Model of Advertising Effectiveness. In: Davis, H.L. and Silk, A.J. (eds) *Behavioral and Management Science in Marketing*, New York, NY: Ronald Press
- Mehta, Abhilasha and Scott C. Purvis (2003), "Consumer Response to Print Prescription Drug Advertising," *Journal of Advertising Research*, 43, 194-206
- Menon, Ajit M., Aparna D. Deshpande, George M. Zinkhan, and Matthew Perry (2004), "A Model Assessing the Effectiveness of Direct-to-Consumer Advertising: Integration of Concepts and Measures from Marketing and Healthcare," *International Journal of Advertising*, 23 (1), 91-112
- Miller, Lucinda G. and Alan Blum (1993), "Physician Awareness of Prescription Drug Costs: A Missing Element of Drug Advertising and Promotion," *Journal of Family Practice*, 36 (1), 33-37
- Mitchell, Andrew A. and Jerry C. Olson (1981), "Are Product Attribute Beliefs the Only Mediator of Advertising Effects on Brand Attitudes?" *Journal of Marketing Research*, 18 (August), 318-322
- Morris, Louis A., and Lloyd G. Millstein (1984), "Drug Advertising to Consumers: Effects of Formats for Magazine and Television Advertisements," *Food Drug Cosmetic Law Journal*, 39, 497-503
- _____, David Brinberg, Ron Klimberg, Carole Rivers, and Lloyd G. Millstein (1986), "The Attitudes of Consumers Toward Direct Advertising of Prescription Drugs," *Public Health Reports*, 101, 82-89
- Myers, Melanie F., Man-Huei Chang, Cynthia Jorgensen, William Whitworth, Sidibe Kassim, James A. Litch, Lori Armstrong, Barbara Bernhardt, W. Andrew Faucett, Debra Irwin, Jody Mouchawar, and Linda A. Bradley (2006), "Genetic Testing for Susceptibility to Breast and Ovarian Cancer: Evaluating the Impact of a Direct-to-Consumer Marketing Campaign on Physicians' Knowledge and Practices," *Genetics in Medicine*, 8 (6), 361-370

- Narayanan, Sridhar, Ramarao Desiraju, and Pradeep K. Chintagunta (2004), "Return of Investment Implications for Pharmaceutical Promotional Expenditures: The Role of Marketing-Mix Interactions," *Journal of Marketing*, 68 (October), 90-105
- Park, Jin Seong and Jean M. Grow (2008), "The social Reality of Depression: DTC Advertising of Antidepressants and Perceptions of the Prevalence and Lifetime Risk of Depression," *Journal of Business Ethics*, 79 (4), 379-393
- Paul, David P., Amy Handlin, and Angela D'Auria Stanton (2002), "Primary Care Physicians' Attitudes toward Direct-to-Consumer Advertising Prescription Drugs: Still Crazy after All These Years," *Journal of Consumer Marketing*, 19 (7), 564-574
- Pechmann, Cornelia, and David W. Stewart (1990), "The Effects of Comparative Advertising on Attention, Memory and Purchase Intentions," *Journal of Consumer Research*, 17(2), 180-191
- Peltzman, Sam (1973), "An Evaluation of Consumer Protection Legislation: The 1962 Drug Amendments," *Journal of Political Economy*, 81 (5), 1049-1091
- Perri, Matthew and Author A. Nelson Jr. (1987), "An Exploratory Analysis of Consumer Recognition of Direct-to-Consumer Advertising of Prescription Medications," *Journal of Health Care Marketing*, 7 (1), 9-17
- Perri, Matthew and W. Michael Dickson (1988), "Consumer Reaction to a Direct-to-Consumer Prescription Drug Advertising Campaign," *Journal of Health Care Marketing*, 8 (2), 66-69
- Peyrot, Mark, Neil M. Alperstein, Doris Van Doren, and Laurence G. Poll (1998), "Direct-to-Consumer Ads can Influence Behavior," *Marketing Health Services*, 18 (2), 26-32
- Petroshius, Susan M., Philip A. Titus and Kathryn J. Hatch (1995), "Physician Attitudes Toward Pharmaceutical Drug Advertising," *Journal of Advertising Research*, 35 (6), 41-51
- Petty, Richard E., and John T. Cacioppo (1986), *Communication and Persuasion: Central and Peripheral Routes to Attitude Change*, New York: Springer-Verlag
- Pines, Wayne L. (1999), "A History and Perspective on Direct-to-Consumer Promotion," *Food and Drug Law Journal*, 54, 489-518
- Rao, Akshay R. and Kent B. Monroe (1989), "The Effect of Price, Brand Name, and Store Name on Buyers' Perceptions of Product Quality: An Integrative Review," *Journal of Marketing Research*, 26 (August), 351-357
- Reichert, Peter S. (1996), "Legal Issues Concerning the Promotion of Pharmaceutical Products on the Internet to Consumers," *Food and Drug Law Journal*, 51, 355-365

- Rheinstein, Peter H. (1982), "A Head Start, a Broader Audience, and an Emphasis on Difference: The New Frontiers of Prescription Drug Promotion," *Food and Drug Law Journal*, 37, 330-335
- Roth, Martin S. (1996), "Patterns in Direct-to-Consumer Prescription Drug Print Advertising and Their Policy Implications," *Journal of Public Policy and Marketing*, 15 (1), 63-75
- Saxton, Matthew L. (2006), "Meta-Analysis in Library and Information Science: Method, History, and Recommendations for Reporting Research," *Library Trends*, 55 (1), 158-170
- Sheehan, Kim Bartel (2003), "Balancing Acts: An Analysis of Food and Drug Administration Letters about Direct-to-Consumer Advertising Violations," *Journal of Public Policy & Marketing*, 22 (2), 159-169
- Shimp, Terence A. (1981), "Attitude toward the Ad as a Mediator of Consumer Brand Choice," *Journal of Advertising*, 10(2), 9-15
- Singh, Tanuja and Donnavieve Smith (2005), "Direct-to-Consumer Prescription Drug Advertising: A Study of Consumer Attitudes and Behavioral Intentions," *Journal of Consumer Marketing*, 22 (7), 369-378
- Statman, Meir and Tyzoon T. Tyebjee (1984), "Strategic Responses to Changes in Public Policy: The Case of the Pharmaceutical Industry and Drug Substitution Laws," *Journal of Public Policy & Marketing*, 99-112
- Tellis, Gerard J. (1988), "Advertising Exposure, Loyalty, and Brand Purchase: A Two-Stage Model of Choice," *Journal of Marketing Research*, 25 (May), 134-144
- Weissman, Joel S., David Blumenthal, Alvin J. Silk, Kinga Zapert, Michael Newman, and Robert Leitman (2003), "Consumers' Reports on the Health Effects of Direct-to-Consumer Drug Advertising," *Health Affairs*, 22 (1), 82-95
- Wilke, Michael (1997a), *Ad Fever Sweeps Health Care Industry*, Advertising Age (January 13)
- Wilke, Michael (1997b), *FDA Close to Easing Limits on Television Ads*, Advertising Age (June 30)
- Wilkes, Michael S., Robert A. Bell, and R. Kravitz (2000), "Direct-to-Consumer Prescription Drug Advertising: Trends, Impact, and Implications," *Health Affairs*, 19 (2), 110-128
- Williams, James R. and Paul J. Hensel (1995), "Direct-to-Consumer Advertising of Prescription Drugs: Attitudes toward This Type of Advertising Influence the Information-Seeking Behavior of Older Adults," *Journal of Health Care Marketing*, 15 (1), 35-41

- Wilson, Rick T. and Brian D. Till (2007), "Direct-to-Consumer Pharmaceutical Advertising: Building and Testing a Model for Advertising Effectiveness," *Journal of Advertising Research*, 47 (3), 270-282
- Wolf, Fredric M. (1986). *Meta-analysis: Quantitative methods for research synthesis*. Beverly Hills, CA: Sage
- Yaros, Ann Marie (2007). Attitudes and Behaviors of Human Services Students Associated with Direct-To-Consumer Advertising (DTCA) of Prescription Drugs. *Dissertation Abstracts International* (UMI No. 3250898)
- Young, James H. (1969), *The Medical Messiahs: A Social History of Health Quackery in Twentieth-Century America*, Princeton University Press, Princeton, NJ
- Yuan, Sheng (2008), "Public Responses to Direct-to-Consumer Advertising of Prescription Drugs," *Journal of Advertising Research*, 48 (1), 30-41
- Zajonc, Robert B. (1980), "Feeling and Thinking: Preferences Need No Inferences," *American Psychologist*, 35, 151-175

BIOGRAPHICAL SKETCH

Wan Seop Jung grew up in South Korea and attended Chung-Ang University before arriving at the University of Florida. His compositions have been performed across the United States and Korea, and his work can be found in *Health Marketing Quarterly* and *Journal of Communication in Healthcare*. Jung's interests include direct-to-consumer advertising, anti-smoking campaign, and social marketing.