**Trust in Prescription Drug Brand Websites:
Website Trust Cues, Attitude toward Website, and Behavioral Intentions**

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Abstract

Direct-to-consumer (DTC) prescription drug brand websites (DTC websites), as a form of DTC advertising, are receiving increasing attention due to the growing number and importance as an ad and a consumer information source. This study examined consumer trust in a DTC website as an important factor influencing consumers' attitude toward the website and behavioral intention. Applying the conceptual framework of website trust, the particular focus of investigation was the effect of the website trust cue factor on consumers' perceived DTC website trust and subsequent attitudinal and behavioral responses. Results show a significant relationship between the website trust cue factor and consumers' perceived DTC website trust. Perceived DTC website trust, in turn, was found to be significantly associated with consumers' attitude toward the DTC website and behavioral intention.

Keywords: DTC prescription drug brand website, DTC prescription drug advertising, website trust, online health information search

For many consumers, the Internet is the first place to turn to when they need information about health. In 2008, 83% of American Internet users had searched the Internet for health/medical information (Fox & Jones, 2009), which makes health information search one of the top online activities. More recent data from Harris Interactive (2010) indicate 76% of U.S. adults had looked online for health information. Consumers' online information search about prescription drugs in particular is also increasing. Choi and Lee (2007) found more than half of their survey respondents had visited websites on prescription drugs. When another survey asked respondents what specific sources they would use to find information on prescription drugs, direct-to-consumer (DTC) prescription drug brand websites (DTC websites) ranked as one of the top sources (DeLorme, Huh, & Reid, 2010).

Despite the growing number of DTC websites and such substantial portions of consumers turning to them for prescription drug-related information, research on this form of DTC advertising is extremely limited. Only five studies on DTC websites have been published in advertising or health communication journals and all of them are content analysis of DTC websites (Davis, Cross, & Crowley, 2007; Huh & Cude, 2004; Macias & Lewis, 2003, 2005; Sheehan, 2007). They examined the content of DTC websites with a framework drawn from the FDA regulatory guidelines, addressing questions related to DTC websites' compliance with the FDA regulation for DTC advertising.

There is no published research on how consumers perceive and respond to specific DTC websites, and there are many questions to be explored to help guide pharmaceutical advertisers build more effective DTC websites that can attract consumers to visit and to use information presented there. If an advertiser built a DTC website, would consumers come? Would they trust the DTC website as an information source? Would they stay on and revisit the website to check out the provided information? Would they use the information for their conversations with a doctor or for their healthcare decision making? Are there things that pharmaceutical advertisers can do with their DTC websites to improve consumer interactions and responses?

To address some of these questions, this study examined consumers' perceived trust in a DTC website and the influence of website trust cues on the perceived trust, and explored the relationship between consumers' perceived DTC website trust and attitudinal and behavioral responses to the website.

DTC Websites

DTC websites, as a form of DTC advertising, serve the information source function for consumers looking for information on medical/health issues and prescription drugs, as well as the advertising function for the pharmaceutical advertisers. In the existing literature, DTC websites are clearly distinguished from general health information websites (e.g., WebMD.com, MayoClinic.com) in that they are created and managed by pharmaceutical companies with intention to promote their drug brands, and also differentiated from pharmaceutical companies' corporate websites in that they are stand-alone branded websites promoting a single drug with "brand.com" URLs (Huh & Cude, 2004; Sheehan, 2007).

With the increasing number of consumers going online for health/medical information, pharmaceutical companies have increased investments in online DTC advertising, including DTC websites (Miley & Thomaselli, 2009), and most offline DTC ads refer consumers to DTC websites for more information (Sheehan, 2007). Although overall DTC advertising expenditures have slightly declined from the 2006 peak level of \$5.5 billion (Arnold, 2009a, 2009b), pharmaceutical companies' spending on online DTC advertising has shown dramatic increases. The total DTC advertising expenditure on the Internet in 2008 was \$137 million, which was 36% increase from the previous year, while the total DTC advertising spending declined 4.3% during the same time period (Miley & Thomaselli, 2009). Estimated total online advertising spending by the U.S. pharmaceutical industry is expected to grow to \$1.52 billion in 2014 (eMarketer, 2010).

Although physicians and pharmacists have been considered the most important information sources for prescription drugs, recent studies have found today's consumers are using much more diverse sources than before and tend to rely on various online sources more frequently than on healthcare professionals (DeLorme et al., 2011). Despite the frequent mention of DTC websites by consumers as an

information source, studies on consumers' prescription drug information search have revealed that DTC websites are perceived and used by consumers differently than non-advertising health information websites (DeLorme et al., 2010, 2011; Huh, DeLorme, & Reid, 2005; Stout, Ball, & Villegas, 2007). Although DTC websites often look like non-advertising health information websites and can contain wealth of information about health, medical conditions, and treatment options, they have distinctive URL including the specific drug brand name (e.g., Claritin.com) and the purpose of such websites is to promote specific drug brands. Due to the commercial intent and consumers' privacy concerns and skepticism toward branded websites in general (Consumer WebWatch, 2002; Princeton Survey Research Associates, 2005), consumers tend to perceive DTC websites are less trustworthy than non-advertising health information websites (DeLorme et al., 2010, 2011; Huh et al., 2005; Stout et al., 2007).

With the preceding information as a backdrop, this study examines consumers' perceived DTC website trust with a particular focus on the influence of website trust cues on perceived trust of a DTC website. The next section defines and discusses the key concepts examined in this study, followed by review of relevant literature and hypotheses.

Definition of Website Trust and Its Application to DTC Websites

Trust, broadly defined as one party's willingness to rely on another party when uncertainty and risk exist (Doney & Canon, 1997; Mayer, Davis, & Schoorman, 1995), has been considered one of the most important factors facilitating sustainable interpersonal relationships, commercial transactions, and online interactive communication, especially when a high level of risk and uncertainty is involved (Doney & Canon, 1997; Fukuyama, 1995; Mayer et al., 1995; McKnight, Choudhury, & Kacmar, 2002a). Many different academic disciplines such as sociology, psychology, economics, marketing, MIS, and communication have paid attention to the important role of trust in human interactions.

As many conceptualizations and views of trust exist, there are also many differing definitions of trust proposed for different research contexts. Applying the trust concept to consumers' trust in advertising in general, Soh and colleagues (2009) defined "ad trust" as "confidence that advertising is a reliable source of product/service information and willingness to act on the basis of information conveyed

by advertising” (p. 86). In the context of websites, website trust or consumers’ perceived trust in a website is defined as trust between consumers and websites (Corritore , Kracher, & Wiedenbeck, 2003) or consumer beliefs that a website will perform expected activities in accordance with consumers’ confidence (Gefen, 2000; Pavlou & Gefen, 2004).

Recently, website trust has drawn increasing attention from advertising and marketing researchers as an important variable influencing consumers’ initial engagement with a website and continuing interactions with it, because the level of uncertainty and risks tend to be higher online compared to offline (Aiken & Boush, 2006; Chen & Dhillon, 2003; Corritore et al., 2003; Lee & Turban, 2001). Many scholars in MIS, e-commerce, and communication have argued that consumers tend to experience higher levels of risks and uncertainty in the online environment because of the relative anonymity in online interactions, so many dubious websites, spam and spyware problems, and various online privacy and security issues related to collection and sharing of personal information by online marketers (Bargh & McKenna, 2004; Liu, Marchewka, & Yu, 2005; Metzger, 2006; Schlosser, White, & Lloyd, 2006).

In the case of non-e-commerce websites such as DTC websites, transaction-related privacy or security concerns and risks might be irrelevant but other types of risks and uncertainties still exist. While the Internet has made it possible for individual consumers to explore the vast quantities of information on any topic, the identities of sponsors or sources of information available online are often unclear and confusing. Furthermore, large portions of information online is not filtered or verified by the journalistic routines and professional standards of the traditional news media. Therefore, trust is likely to play an important role in consumers’ responses to and interactions with information websites or brand websites that do not sell products, as in e-commerce contexts.

Literature Review and Hypotheses

Effects of Website Trust Cues on Consumer Trust

Previous studies on website trust in the contexts of communication, advertising, and e-commerce have identified various antecedents and influencing factors of website trust and they can be divided into consumer factors and website factors. Consumer factors influencing formation of website trust include an

individual's disposition to trust or dispositional trust (Lee & Turban, 2001; McKnight & Chervany, 2001-2002; McKnight, Kacmar, & Choudhury, 2004), Internet usage and past Internet experience (Aiken & Boush, 2006; Bart et al., 2005), concerns for privacy and security (Metzger, 2006) and familiarity with the website (Bart et al., 2005; Gefen, 2000; Wingreen & Baglione, 2005).

Among the many factors, dispositional trust and perceived risks have emerged as consistently significant antecedents of website trust when consumer demographics and Internet usage are controlled for (Chen & Dhillon, 2003; Gefen, 2000; Lee & Turban, 2001; McKnight et al., 2002b). Dispositional trust is defined as "the extent to which one displays a consistent tendency to be willing to depend on others in general across a broad spectrum of situations and persons" (McKnight & Chervany, 2001-2002, p. 45). An individual forms this disposition through learning and experiences with others over lifetime and act it out as a general tendency when faced with unfamiliar persons, objects, or situations (Mayer et al., 1995; McKnight & Chervany, 2001-2002). McKnight and Chervany (2001-2002) argued that dispositional trust is an especially important factor when the object of trust and the situation are unfamiliar, such as encountering an unfamiliar website. Dispositional trust, however, is a characteristic of individual consumers and not a factor that can be controlled by the advertiser.

What marketers can control are various website characteristics. Studies investigating website characteristics have focused on two types of factors: (1) website design factors (i.e., visual appeal) and (2) trust cues or content feature factors. The website design factors include color scheme, professional look, font style, and overall aesthetics (Belanger, Hiller, & Smith, 2002; Fogg et al., 2003; Mauldin & Arunachalam, 2002; McKnight et al., 2004; Schlosser et al., 2006).

Website trust cues refer to website content features that can function as heuristic cues or signals for consumers to use to determine whether or not to trust an unfamiliar website (Mayer, Huh, & Cude, 2005). For example, Consumer WebWatch (2002) advises consumers to look for information about website identity, advertiser and sponsor relations, information currency, and privacy practices. For health-related information search in particular, Medical Library Association (2003) suggests that consumers seek

indicators of the currency and clarity of a website's information and the possible motives of the site's sponsors.

Trust cues take many different forms, including website identity information (e.g., site ownership, "About Us," contact information), third-party seals of approval or endorsements (e.g., BBBOnline, TRUSTe, Verisign, Hackers Safe), information currency (e.g., last updated dates), presence of ads or commercial relationships to advertisers, privacy policy statement, warranty statement, links to other well-known websites, and presence of consumer feedback features (Aiken & Boush, 2006; Consumer WebWatch, 2002; Cook & Luo, 2003; Lee & Huh, 2010; Mayer et al., 2005; Miyazaki & Krishnamurthy, 2002; Princeton Research Associates, 2002; Rifon, LaRose, & Choi, 2005). Existing studies have not extensively tested all of these trust cues and empirical evidence for the effects of different cues on consumers' perceived website trust has been rather mixed. However, despite some of the mixed findings for individual cues' effects, the general notion of trust cues influencing consumers' perceived website trust has received substantial empirical support (Aiken & Boush, 2006; Fox & Rainie, 2002; Lee & Huh, 2010).

In summary, the research literature on website trust cues and consumers' perceived website trust suggests that consumers tend to use a variety of website cues that are likely to facilitate perceived website trust and that the presence of more website trust cues would lead to higher perceived website trust and more positive responses to the website. The current study, therefore, tests the effect of website trust cues as a key website factor influencing consumers' perceived DTC website trust and attitudinal and behavioral intention outcomes. To do this, it is necessary to control for consumers' individual differences such as dispositional trust and demographic characteristics. Specifically, we hypothesize:

H1: Website trust cues will influence consumers' perceived DTC website trust, attitude, and behavioral intention toward the DTC website, when consumers' dispositional trust and other characteristics are controlled for. Specifically, perceived trust in DTC website, attitude, and behavioral intention will be higher in the high trust cue website condition than in the low trust cue condition regardless of consumers' dispositional trust.

Relationship between Perceived Website Trust and Attitudinal and Behavioral Responses

A substantial amount of research has demonstrated the crucial role of website trust in encouraging consumers to engage in online shopping (e.g., Bryant & Colledge, 2002; Lee & Turban, 2001; Pavlou, 2003) and influencing attitude and purchase intention (e.g., Bart et al., 2005; Schlosser et al., 2006). For example, Schlosser and associates (2006) found perceived website trust influenced consumers' online purchase intentions. Another study revealed consumers' perceived website trust influenced their intention to purchase from or revisit the website, and whether they would recommend the site to others (Liu et al., 2005). Bart et al. (2005) reported trust partially mediated the relationship between website characteristics and consumers' behavioral intent, and this mediating effect was strongest for websites of infrequently purchased, high involvement products.

Compared to the abundant evidence of significant relationships between perceived website trust and attitude and behavioral outcomes in the e-commerce research literature, research on the effects of consumers' perceived trust in the advertising contexts (e.g., attitude toward advertising and non-purchase behavioral intention) is scarce (Soh et al., 2009). However, the conceptual models explaining the antecedents and consequences of website trust and empirical findings from the research in the e-commerce context seem applicable to the present study's investigation of perceived trust toward DTC websites. They also offer useful guidance for drawing a hypothesis regarding the effect of perceived DTC website trust on behavioral intention.

The only systematic application of the trust concept to the advertising context is found in Soh et al. (2009). They developed the concept of ADTRUST (trust in advertising) and measurements for this concept, and empirically tested the validity of the ADTRUST measurement by examining its relationships to common advertising outcome variables including attitude toward the ad, use of ad-conveyed information for purchase decision making, and ad avoidance. The results revealed ADTRUST was significantly and positively related to all of the advertising outcome variables.

Thus, the following hypotheses are posed regarding the effects of perceived DTC website trust on consumers' attitude toward the website and behavioral intention.

H2: There will be a significant and positive relationship between the level of perceived DTC website trust and consumers' attitude toward the website. This relationship will remain significant after controlling for the trust cue factor and consumer demographic and predispositional traits.

H3: There will be a significant and positive relationship between the level of perceived DTC website trust and consumers' behavioral intention to revisit and use the information obtained from the website. This relationship will remain significant after controlling for the trust cue factor and consumer demographic and predispositional traits.

Methods

To test the hypotheses, we designed a quasi-experiment with random assignment of subjects in which the subjects visited randomly assigned real DTC websites with varying levels of trust cues in a realistic exposure setting. The data collection procedure involved the following steps: (1) filling out a Web-based questionnaire asking questions regarding general online product information search and health information search behaviors; (2) visiting and browsing one of the selected DTC websites randomly assigned to each subject; (3) then, coming back to the survey site to complete the questionnaire which included questions regarding trust in the DTC website they just viewed, attitude toward the website, behavioral intentions, and consumer dispositional and demographic characteristics.

Our methodological approach, using real live DTC websites and collecting data in a natural setting rather than in a tightly controlled lab setting, has both advantages as well as disadvantages. Most existing experimental studies on website trust and trust cues tended to force the subjects to be exposed to particular trust cues (e.g., Yang et al., 2006) or artificially increased the level of attention to particular trust cues of interest by making such trust cues easily noticeable in a fictitious website which do not look or feel like websites consumers commonly encounter on the Internet (e.g., Aiken & Boush, 2006; McKnight et al., 2004; Rifon et al., 2005). Using a realistic professionally produced website with interactive and dynamic features for experimental purposes would overcome these problems, but would be cost prohibitive. By utilizing real live websites and allowing subjects to visit and view the assigned website freely in a natural way and in natural environments, the present study brings in realism and improves external validity (Wimmer & Dominick, 2010).

On the other hand, as a form of field experiment, this study's design has disadvantages related to increased internal validity threats. For example, we could not directly observe and control each subject's visit to an assigned DTC website. Although the time spent on the website was measured, we did not have ability to know how each subject viewed the website and how deeply each subject went into the site. Also, we did not have control over the website design and content and thus, could not completely control other website factors such as design look, subjective feel of aesthetics, and specific information content presented in each website. In addition, since this study used existing drug brand websites, consumers' prior awareness, personal relevance, and attitude toward the particular drug brands and the medical symptoms they treat might have some influence on their responses. We employed data analysis strategies to try to mitigate these internal validity threats and they will be discussed later in this section.

Selection of DTC Websites

We systematically analyzed existing DTC websites and selected a set of websites with a higher level of trust cues and another set of websites with a lower level of trust cues. First, through an extensive and thorough search using the existing literature and popular search engines, a total of 108 DTC websites were identified. A coding scheme was developed to identify website trust cues based on previous literature, and on recommendations by health professionals, information search experts, and consumer organizations (e.g., Fogg et al., 2003; Mayer et al., 2005; Medical Library Association, 2003; Princeton Survey Research Associates, 2005). Table 1 presents items representing various website trust cues that were included in the coding scheme.

Table 1 about here

Two coders were trained and independently analyzed each website for presence of different types of trust cues. The number of trust cues presented in each website was counted to compute a website trust cue score. The mean score for website trust cues was 10.8 and the scores for individual websites ranged from 5 to 18. Based on the analysis results, two websites with the highest trust cue score were selected for the high trust cue condition (Diovan (www.diovan.com/index.jsp) and Ditropan (www.ditropanxl.com/))

and two websites with the lowest trust cue score were selected for the low trust cue condition (Celexa (www.celexa.com) and Skelaxin (www.kingpharm.com/skelaxin/default.asp)).

Specific trust cues included in each of these websites are presented in Table 2. Various navigational tools were available in all websites and some forms of contact information were available in three of the four websites. Differences between the high and low trust cue websites were found mainly for the inclusion of privacy policy statement, third-party endorsements, information currency, and the extent of details in drug risk information. In terms of drug product information, while all websites provided both benefit and risk information somewhere, the extent of details (e.g., types of information, use of numeric descriptors) differed between the high and low trust cue websites.

Table 2 about here

Sampling and Data Collection Procedure

A national representative sample of consumers was obtained from an existing online panel recruited by a well-known online survey provider. This company provides a reliable national random sample using a RDD method. A sample of 325 respondents meeting the desired selection criteria for this study (adults who had searched the Internet for product/service-related information in the past six months) was randomly selected from the pre-established survey panel.

The respondents received a notification email letting them know there is a survey available for them to take. When respondents logged in using the assigned log-in password, they were randomly directed to one of four conditions. After filling out the questions regarding general online product information search and health information search, respondents were asked to visit the assigned DTC website and to view this website for at least 5 minutes or until they had a good feel for the site. The instructions specifically said “The website may not be relevant to you. However, while reviewing, try to evaluate overall trustworthiness of the website.” After viewing the website, respondents returned to the survey site and completed the remaining questions regarding trust in the DTC website they just viewed, attitude toward the DTC website, and behavioral intentions. At the end of the data collection period, a total of 181 completed questionnaires were submitted.

Respondent Characteristics

Demographic characteristics of survey respondents are presented in Table 3 and the sample characteristics were compared to the population profile obtained from the U.S. Census data (available at <http://censtats.census.gov>). The average age of the respondents was 44 (SD = 17.0, median = 42), ranging from 18 to 87 years old. Although median age of the U.S. population is 36.7, among those who are 18 or older, the median age goes up to the 45-49 range (no official median age of the population 18 or older is available from the U.S. Census reports, but percentages for 5-year interval age categories are available). The sample was composed of 52.5% females and 47.5% males, and predominantly White (75.7%). The U.S. adult population (18 years or older) is composed of 51.5% women and 72.4% Whites. Thus, those who participated in this study were similar to the U.S. adult population on age, gender, and race. However, the study participants were better educated than the population: While over one third (34.2%) of the respondents had at least a Bachelor's degree, only 27.8% of the adult population fell into the same category.

Table 3 about here

Measurements

Disposition to trust was measured by nine 7-point scale questions and *perceived DTC website trust* was measured by nine 7-point scale items taken from McKnight et al. (2002b). *Attitude toward the DTC website* was measured by five 7-point semantic differential scales adapted from research on attitude toward advertising in general (MacKenzie & Lutz, 1989; Muehling, 1987). *Behavioral intention* was measured by five 7-point Likert scales using the following statements, which reflect the most common expected effects of DTC advertising (Huh & Becker, 2005; Huh et al., 2004): (1) I will visit this site again to get information I need for myself or someone I know; (2) I would be willing to depend on the information or advice provided by the site; (3) I will talk to my doctor about the information I found from this website; (4) I will use the information from this website as I make decisions about how to take care of myself or loved ones; and (5) I would recommend this site to a friend or family member.

Frequency of health information search was measured by a 7-point scale question asking “In the past six months, how frequently have you searched the Internet for health or medical-related information or advice?” with 1 indicating “never” and 7 indicating “everyday or almost everyday.” *Perceived importance of prescription drug information* was measured on a 7-point scale, where 1 indicating “not important” and 7 indicating “extremely important.” *Perceived health* was also measured by a 7-point scale anchored on “extremely unhealthy” and “extremely healthy” (DeLorme et al., 2010; Huh et al., 2005). In the final section of the questionnaire, demographics were collected.

Variable Construction

Summated variables were created for data analysis and reliabilities were checked with Cronbach’s alpha tests. A *dispositional trust* score was created by averaging the nine measurement items (Cronbach’s $\alpha = .88$). The mean score of the summated *dispositional trust* was 4.63 (SD = .88). A summated score for *perceived DTC website trust* was computed by averaging the nine scores from this measurement (Cronbach’s $\alpha = .94$). The mean value of the summated *perceived DTC website trust* score was 4.33 (SD = 1.02). A summated score for *attitude toward the DTC website* was computed by averaging the five measurement items (Cronbach’s $\alpha = .90$) and a summated *behavioral intention* score was computed by averaging the five items measuring behavioral intention (Cronbach’s $\alpha = .90$).

Random Assignment Checks and Control for Potential Confounding Factors

Forty-four respondents visited the Diovan website and another 45 the Ditropan website (89 for the high trust cue website condition), and 49 viewed the Celexa website and 43 the Skelaxin website (92 for the low trust cue website condition). To examine how successful the random assignment was, respondents’ demographic and dispositional characteristics were compared among the four website conditions. For all consumer characteristics, no significant difference was found, confirming successful randomization (Table 4).

Table 4 about here

Before testing the hypotheses, the two high trust cue condition groups (visitors to the Diovan website and the Ditropan website) were combined to form a high website trust cue group, and the other

two low trust cue condition groups (visitors to the Celexa website and the Skelaxin website) were combined to form a low website trust cue group. ANOVA results for the three dependent variables showed no significant difference between the two website groups combined to form the high website trust cue group (*perceived DTC website trust* $F(1, 86) = .25, p = .61$; *attitude toward the DTC website* $F(1, 84) = .11, p = .74$; *behavioral intention* $F(1, 85) = 1.77, p = .19$). The same was true for the low website trust cue group (*perceived DTC website trust* $F(1, 88) = 1.49, p = .23$; *attitude toward the DTC website* $F(1, 88) = 2.06, p = .16$; *behavioral intention* $F(1, 88) = .49, p = .49$). By combining two websites that are different in terms of design and actual information content but similar in terms of the level of website trust cues, we attempted to mitigate the internal validity threat stemming from using real live websites with varying design and content elements.

As we discussed earlier, our study design also had other potential threats to internal validity caused by not having control over the website viewing situation and varying levels of prior awareness or personal relevance by individual subjects. To address these weaknesses, we examined variables that are likely to have confounding effects on this study's key variables of interest. First, the time spent on viewing websites was examined. The median time for the subjects to complete the task was about 16 minutes and about 80% of the respondents were able to finish it within 25 minutes. The time for task completion did not significantly vary among the four website conditions ($F(3, 174) = .15, p = .93$) or between the combined high and low trust cue groups ($F(1, 176) = .25, p = .62$), indicating the respondents assigned to different websites took similar amount of time.

To avoid potential confounding effects of consumers' prior experiences or familiarity with the DTC website visited, the respondents were asked whether they had ever visited the assigned website before. Three respondents reported they had visited the assigned DTC website before: two respondents belonged to the Celexa website condition and one was in the Ditropan website condition. These respondents were removed from the analysis. Thus, the data analysis for testing the hypotheses was performed with the remaining 178 respondents who had no prior experience or knowledge about the website they evaluated.

It is likely that health information is sought by consumers who need it either for themselves or for someone close to them. Among the 178 respondents, 49 respondents (27.5%) answered “yes” to the question asking if they or someone close to them had the medical conditions described in the website they visited, 98 or 55.1% said “no,” and 31 or 17.4% said “don’t know.” The percentages did not differ significantly between the high and low website trust cue groups ($\chi^2 = 2.57$, $df = 2$, $p = .28$). However, we added this variable (*personal relevance of the drug*) as a covariate in all of the hypotheses testing analysis to control for its potential confounding effect.

Results

H1: Effects of the Website Trust Cue Factor

H1 predicted consumers in the high website trust cue condition would show higher levels of *perceived DTC website trust*, *attitude*, and *behavioral intention* than would those in the low website trust cue condition, when *dispositional trust* and other consumer characteristics were controlled for. MANCOVA was performed, with consumers’ *dispositional trust* and other demographic and health-related variables entered as covariates. The results revealed significant differences between the high and low website trust cue conditions on the combined dependent variable (Wilks’s $\lambda = .93$, $F(3, 119) = 2.97$, $p = .03$). None of the covariates including *dispositional trust* were found to be significantly related to the combined dependent variable (see Table 5). Thus, H1 was supported. The results suggest that, regardless of consumers’ dispositional trust and demographic and health-related characteristics, DTC websites with more trust cues are more likely to generate consumer trust in the website during the initial encounter.

Table 5 about here

Follow-up ANCOVA results on each of the three dependent variables present mean score differences for each of the dependent variables between the high and low website trust cue conditions (see Table 6). As hypothesized, the *website trust cue factor* was found to significantly related to *perceived DTC website trust* ($F(1, 121) = 7.81$, $p = .01$) and *behavioral intention* ($F(1, 121) = 6.37$, $p = .01$). However, it was not significantly related to *attitude toward the DTC website* ($F(1, 121) = 1.61$, $p = .21$). The results suggest that DTC websites with more trust cues are likely to lead to higher perceived DTC

website trust and higher intention to revisit the DTC website and use the information obtained from there. However, DTC website trust cues do not appear to have significant relation to consumers' attitude toward the website.

Table 6 about here

H2: Relationship between Perceived DTC Website Trust and Attitude

H2 predicted consumers with higher levels of *perceived DTC website trust* would have more positive *attitude toward the DTC website*. A hierarchical regression analysis was performed with the summated *attitude toward the DTC website* score as the dependent variable. The predictor variables were entered in three blocks to test the effect of *perceived DTC website trust* on *attitude toward the DTC website* while controlling for the website trust cue factor and consumers' demographic, predisposition, and health-related characteristics. The first block entered five demographic variables, *dispositional trust*, *frequency of health information search*, *perceived importance of prescription drug information*, *perceived health*, and *personal relevance of the drug* using a stepwise method. Next, the *website trust cue factor* dummy variable was entered, and then in the last block, *perceived DTC website trust* was entered.

The results revealed *perceived DTC website trust* emerged as the most prominent predictor of *attitude toward the DTC website*, when the *website trust cue* factor, *dispositional trust* and consumer demographic and health-related variables were controlled for (Table 7). The *website trust cue* factor was not related to consumers' *attitude toward the DTC website* and none of the consumer factors, except for *personal relevance of the drug*, was found to be a significant predictor. The final regression equation explained 30% of the total variance in the dependent variable.

Table 7 about here

Overall, the regression results suggest that, while consumers with higher levels of personal relevance of the advertised drug are more likely to have positive attitude toward the DTC website, the most important and strongest predictor of attitude toward the DTC website is perceived trust in the DTC website. Thus, H2 was supported.

H3: Relationship between Perceived DTC Website Trust and Behavioral Intention

H3 predicted consumers with higher levels of *perceived DTC website trust* would be more likely to revisit the DTC website and use the information obtained from the site. The same hierarchical regression analysis used in testing H2 was performed with *behavioral intention* as the dependent variable. Same as the results from the previous analysis for attitude, *perceived DTC website trust* emerged as the strongest predictor of *behavioral intention*, when the *website trust cue* factor, *dispositional trust* and consumer demographic and health-related variables were controlled for (see Table 8).

Table 8 about here

While *website trust cues* was initially a significant predictor of *behavioral intentions*, this relationship disappeared after *perceived DTC website trust* was entered into the equation. In the full model, *perceived DTC website trust* was the only significant predictor of intentions to revisit the DTC website and to use the obtained information for their discussions with a doctor and for healthcare decision making. The regression model explained 44% of the total variance in the dependent variable. The results provide clear support for H3 and suggest that, regardless of consumer characteristics and dispositional trust, consumers with higher levels of trust in a DTC website are more likely to revisit the site for information search and use the information provided by the website for their discussions with a doctor and healthcare decision making.

Discussion

Today's consumers are increasingly relying on online sources for information search about health-related issues and prescription drug-related information in particular. Along with this trend, pharmaceutical marketers have steadily increased investment in online DTC advertising, including DTC websites. Despite the aforementioned consumer trend and the growth of DTC websites as a type of DTC advertising and as a useful information source for consumers, empirical research on this topic has been extremely limited to content analysis focusing on regulatory issues or surveys examining consumer perceptions about online health information or online DTC advertising in general. There has been no research on consumer perceptions of and responses to specific DTC websites.

To fill this void in the literature and to contribute to developing more effective strategies for DTC websites to attract and appeal to consumers as a trustworthy information source, this study examined the effects of website trust cues on consumers' perceived trust in a DTC website and on subsequent attitudinal and behavioral responses. The present study specifically focused on the website factor – trust cues – that are under the control of the pharmaceutical marketers and can be actively managed by applying certain trust building strategies. Following previous research suggestions, however, we included dispositional trust, along with other consumer characteristics, in our analysis as a covariate to control for the effect of this consumer factor.

This study's findings demonstrate a significant relationship between the website trust cue factor and consumers' perceived trust in a DTC website when dispositional trust was controlled for. Consumers who visited the DTC website with a higher level of trust cues showed a significantly higher levels of trust in the website and higher levels of intention to revisit the site for their information search and to use the information obtained from the site. In turn, consumers' perceived DTC website trust was strongly related to both attitude toward the website and behavioral intention.

The findings on the effects of website trust cues are in line with previous research suggesting that consumers look at trust cues as a heuristic shortcut to determine whether or not to trust a website when encountering an unfamiliar website and that such website trust cues do influence consumers' perceived trust in the website and subsequent responses (Aiken & Boush, 2006; Eysenbach & Kohler, 2002; Fox & Rainie, 2002; Schlosser et al., 2006). While the evidence for effects of specific website trust cues has been mixed in the previous literature, this study's findings suggest significant effects exerted by the website trust cue factor across different levels of consumer dispositional trust and demographic segments, and call for more research attention to this factor.

A particularly interesting finding regarding the effects of the website trust cue factor was that the website trust cue effects varied depending on the type of outcome variables. While website trust cues were significantly related to consumers' perceived website trust and behavioral intention, it was not significantly related to consumers' attitude toward the website, at least in the context of DTC websites.

This finding may be explained by the conceptual characteristics of trust. Although trust is a multidimensional concept, as Soh et al. (2009) discovered from their research on advertising trust, the cognitive dimension tends to be the “backbone” of the conceptual nature of trust, particularly when this concept is applied to advertising. Consistent with Soh et al.’s (2009) findings, the present study’s results also seem to suggest that trust in advertising (in this case, trust in DTC websites) is cognition-based trust.

However, we must be careful not to place too much emphasis on the findings about the relationships between the website trust cue factor and advertising outcomes of DTC websites such as attitude toward the website and intention to behave as expected by the advertiser. The results from the hierarchical regression analyses examining the relationships between perceived website trust and attitude and behavioral intention revealed that the website trust cue factor is unlikely to be directly connected to these outcome variables. Consistent with the conceptual models of website trust developed in the e-commerce context (e.g., Model of E-Commerce Customer Relationships Trust Constructs by McKnight & Chervany (2001-2001), Trust Building Model by McKnight et al., (2002a)), when perceived DTC website trust was introduced, neither website trust cue factor nor consumer factors were directly related to attitude toward the DTC website and behavioral intention. Perceived DTC website trust was consistently and strongly linked to the two outcome variables across the website conditions and different consumer segments.

Implications

This study provides meaningful contributions to the DTC advertising literature and offers practical implications for pharmaceutical advertisers and health communication practitioners. First, this study addresses the significant gap in the DTC advertising literature by examining consumer perceptions and responses to DTC websites and a specific type of strategy (website trust cues) that is likely to generate better communication outcomes for this form of DTC advertising.

Second, by applying the conceptual framework of website trust and its antecedents and consequences to the advertising context, this study pushes the boundaries of the website trust research

beyond the e-commerce contexts and, at the same time, demonstrates the viability of the trust concept and theoretical framework for advertising effect research.

Third, as the first empirical study examining website content characteristics influencing perceived DTC website trust and demonstrating a significant association between website trust cues and perceived website trust, and relationships between perceived website trust and attitude and behavioral intention, this study offers useful insight for pharmaceutical marketers. To increase the effectiveness of interactive DTC advertising efforts online, advertisers should pay close attention to consumers' perceived trust of their interactive ads and invest in trust-enhancing features on their websites. By carefully incorporating empirically-proven website trust cues into their websites, advertisers would likely to be able to enhance consumers' initial trust formation at an early stage of exposure and interaction with their websites. This study suggests that establishing and maintaining consumer trust is critical for DTC websites to stay relevant to consumers and to fulfill the expectations set by the public and the regulatory agency, and to remain an effective communication tool for the advertisers and a useful information source for consumers.

Limitations and Suggestions for Future Research

Our study has several methodological limitations and interpretation of the study findings should be done with consideration of them. First, this study used only four DTC websites, although special care was taken to select them to represent different levels of trust cues. Future research should replicate this study with other DTC websites and other health information websites. Another limitation is that this study focused on a single independent variable – website trust cues. To help build a more comprehensive model of perceived DTC website trust and effects, more research is needed to test influences of other factors on perceived website trust, such as consumers' perceived trust of the Internet and health information websites in general, prior DTC website experience, consumers' perceived risks and uncertainty in online health information search, and symptom/product involvement.

Additionally, it should be noted that we forced respondents to visit each assigned DTC website that they might not likely visit otherwise, and we did not monitor or control the actual website viewing behaviors of the study participants. Thus, although we provided specific instructions for the website

browsing and checked the amount of time spent by each group of participants, we cannot guarantee that each participant browsed the assigned website in the same way, and do not know how individual participants navigated the website and how deeply they went into the site.

This study's questionnaire included limited variables in order to reduce the time and task burden of the respondents and to improve completion and response rates. We encourage future studies to include other DTC advertising-related variables that are likely to have influence on consumers' interactions with and responses to DTC prescription drug brand websites, including prior exposure and awareness of DTC ads in traditional media and attitude toward DTC advertising in general. Also, adopting the ADTRUST scale proposed by Soh et al. (2009) for the perceived website trust measurement will improve the measurement and might discover multifaceted relationships between this construct and other response variables.

Finally, while the use of real live websites in the field experimental setting enhances external validity, it does introduce several threats to internal validity. Despite our efforts to control these potential threats through sample screening and statistical procedures, some internal validity issues still remain including the potential influence of website design factors and consumers' prior attitude toward and experience with some of the drugs.

It is our hope that, building upon this study's findings and taking our limitations as opportunities, future research will continue investigation on DTC websites focusing on their effects as advertising and as a type of consumer information source, and various consumer and website characteristics influencing the effects and effectiveness of DTC websites. With an increasing number of consumers engaged in online health information search, pharmaceutical advertisers have unprecedented opportunities to learn about individual consumers to a great extent and directly communicate with them, but at the same time, face challenges stemming from heightened consumer concerns and fears about online privacy and security problems and declining trust in general (Horrigan, 2008; Stout et al., 2007).

To further test this study's findings, we suggest future research examine consumer trust in other forms of online DTC advertising contexts and formats, and non-advertising health information websites.

Other methodological approaches are also warranted. A lab experiment is recommended for further testing the suggested relationships with stronger internal validity. Also, considering the complex nature of website trust and the lack of in-depth knowledge about how consumer trust is formed in unfamiliar vs. familiar online contexts, qualitative research using in-depth interview or focus group methods is likely to offer valuable additional insight about the subject.

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Table 1. Website Features Serving as Trust Cues

Navigational tools	<ul style="list-style-type: none"> • Search engine • Site map • Navigation buttons on the homepage • Navigation buttons on other pages
Warnings and disclaimers	<ul style="list-style-type: none"> • Audience identification – Clearly stating whether the information is intended for the consumer in the United States or others (this was found to be a constant) • Disclaimer for the site’s responsibility about the content • Warning about the appropriate use of the information
Information comprehensiveness/ completeness	<p>Does the website contain important product information such as:</p> <ul style="list-style-type: none"> • Drug efficacy and benefits • Drug risks (e.g., side effects, contraindications, precautions) • Fair balance on the homepage • Independent research results • Company-sponsored research results • Any story or account given by an individual consumer (either anonymous or specific by name) regarding the health conditions and/or the drug • Statistics such as numeric descriptors of side effects • Other information sources
Privacy policy and data security	<ul style="list-style-type: none"> • Privacy policy • Information regarding consumer information (i.e., what information is gathered, what is done, what choices and access do consumers have, and data secure)
Contact information	<ul style="list-style-type: none"> • Email address • Phone number • Physical address
Information source disclosure	<ul style="list-style-type: none"> • Information source / authorship information • Credentials of information sources
Third-party endorsements	<ul style="list-style-type: none"> • Seals of approval or awards(e.g., TRUSTe, VIPPS, BBBOnline)
Information currency statement	<ul style="list-style-type: none"> • Statement about overall currency of the site • Dates of content update

Table 2. Trust Cues Included in the Selected Websites

Website	Trust cues
Celexa (score=5)	Warning about appropriate use of information Search engine Navigation buttons on homepage Navigation buttons on other pages Only benefit information on homepage, but risk information somewhere in the site
Skelaxin (score=7)	Phone number Responsibility statement for information or advice Privacy policy Navigation buttons on homepage Navigation buttons on other pages Both benefit and risk information on homepage Risk information somewhere in the site
Ditropan (score=17)	Phone number Seal of TRUSTe Seal of VIPPS Seal of BBB Accreditation by HON Other third-party endorsement Responsibility statement for information or advice Information currency Statistics regarding drug efficacy/benefit/risk Story/account by individual consumer Warning about appropriate use of information Privacy policy Site map Navigation buttons on homepage Navigation buttons on other pages Both benefit and risk information on homepage Risk information somewhere in the site
Diovan (score=16)	Address for customer contact Email dialogue box without email address Phone number Third-party endorsement Responsibility statement for information or advice Statistics regarding drug efficacy/benefit/risk Story/account by individual consumer Warning about appropriate use of information Privacy policy Search engine Site map Navigation buttons on homepage Navigation buttons on other pages Both benefit and risk information on homepage Risk information somewhere in the site Numeric descriptors of side effects information

Table 3. Characteristics of Survey Respondents

	Frequency	Percent
Gender		
Male	86	47.5
Female	95	52.5
Education		
Less than high school	2	1.1
Some high school, no diploma	17	9.4
Graduated from high school	53	29.3
Some college, no degree	33	18.2
Associate degree (AA, AS)	14	7.7
Bachelor's degree	42	23.2
Grad/professional degree	20	11.0
Race		
White, Non-Hispanic	137	75.7
Black, Non-Hispanic	13	7.2
Other, Non-Hispanic	6	3.3
Hispanic	19	10.5
Other/mixed race	6	3.3
Total	181	100.0

Table 4. Random Assignment Checking

Website	Age	Gender	Race	Education	Income	Dispositional trust
	Mean	% of women	% of Whites	Median	Median	Mean
Celexa	43.94	59.6%	78.7%	Some college	\$50,000 - \$59,999	4.38
Skelaxin	42.93	51.2%	69.8%	Some college	\$50,000 - \$59,999	4.65
Ditropan	46.82	45.5%	79.5%	Some college	\$40,000 - \$49,999	4.74
Diovan	43.32	50.0%	75.0%	Some college	\$50,000 - \$59,999	4.76

Age: $F(3, 174) = .47, p = .71$

Gender: $\chi^2 = 1.91, df = 3, p = .59$

Race: $\chi^2 = 1.43, df = 3, p = .70$

Education: $\chi^2 = 29.09, df = 24, p = .22$

Income: $\chi^2 = 53.75, df = 51, p = .37$

Dispositional trust: $F(3, 174) = 1.79, p = .15$

Table 5. MANCOVA Results

Variables	Wilks's λ	$F(3, 119)$	p
High (vs. low) trust cue website	.93	2.97	.03
Dispositional trust	.97	1.04	.38
Gender (1 = male)	.98	.93	.43
Race (1 = White)	.99	.27	.85
Age	.95	2.30	.08
Education	.99	.48	.70
Income	.97	1.16	.33
Frequency of health information search	.98	.70	.56
Perceived importance of Rx drug information	.99	.50	.68
Perceived health	.95	1.97	.12
Personal relevance of the drug (1 = yes)	.97	1.33	.27

Table 6. Univariate ANCOVA Results

Dependent variables	Mean (SD)		<i>F</i>
	Low trust cues (n = 72)	High trust cues (n = 61)	
Perceived DTC website trust	4.06 (1.05)	4.61 (.89)	7.81**
Attitude toward DTC website	4.35 (1.08)	4.65 (1.20)	1.61
Behavioral intention	3.91 (1.44)	4.54 (1.40)	6.37*

* $p < .05$, ** $p < .01$

Table 7. Hierarchical Regression for Predicting Attitude toward DTC Website (N = 134)

Predictors		Beta
Model 1	Age	.23**
	Personal relevance of the drug	.22**
	$df = 2$, $MS = 9.77$, $F = 8.41$, $p = .00$, Adjusted $R^2 = .10$	
Model 2	Age	.24**
	Personal relevance of the drug	.21*
	High (vs. low) trust cue website	.12
	$df = 3$, $MS = 7.27$, $F = 6.30$, $p = .00$, Adjusted $R^2 = .11$	
Model 3	Age	.14
	Personal relevance of the drug	.18*
	High (vs. low) trust cue website	.01
	Perceived DTC website trust	.47**
	$df = 4$, $MS = 13.78$, $F = 15.24$, $p = .00$, Adjusted $R^2 = .30$ **	

* $p < .05$, ** $p < .01$

*, ** for Adjusted R^2 indicates significance of R^2 increments

Table 8. Hierarchical Regression for Predicting Behavioral Intention (N = 134)

	Predictors	Beta
Model 1	Age	.20*
	$df = 1, MS = 11.29, F = 5.38, p = .02, \text{Adjusted } R^2 = .03$	
Model 2	Age	.20*
	High (vs. low) trust cue website	.20*
	$df = 2, MS = 11.16, F = 5.49, p = .01, \text{Adjusted } R^2 = .06^*$	
Model 3	Age	.06
	High (vs. low) trust cue website	.04
	Perceived DTC website trust	.65**
	$df = 3, MS = 43.22, F = 35.40, p = .00, \text{Adjusted } R^2 = .44^{**}$	

* $p < .05$, ** $p < .01$ *, ** for Adjusted R^2 indicates significance of R^2 increments

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