Experimental Study: Effect of Promotional Offers in Direct-to-Consumer Prescription Drug Print Advertisements on Consumer Product Perceptions

0910-Number

SUPPORTING STATEMENT B

Submitted by

Office of Prescription Drug Promotion
Center for Drug Evaluation and Research
Office of the Commissioner

Food and Drug Administration

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B. COLLECTIONS OF INFORMATION EMPLOYING STATISTICAL METHODS

1. Respondent Universe and Sampling Methods

Two samples will be recruited for Study 1 and one sample will be recruited for Study 2. For Study 1, the first sample will consist of 1,950 eligible participants recruited for participation in eight or more geographically dispersed shopping malls. Shopping malls will be selected to assure that the respondent universe represents varying degrees of education and other socioeconomic and ethnic variables. One thousand (1,000) pretest participants, 1,950 Study 1 online sample participants, and 1,950 Study 2 participants will be recruited from a panel of one million households. All participants will complete a prescreening questionnaire (screener), and we will recruit participants who indicated that they have been diagnosed with or meet the diagnostic criteria for insomnia (Study 1) or have been diagnosed by a healthcare professional with high blood pressure (Study 2) regardless of whether or not they take prescription medicine for the condition (see Appendix 2 for the screener and Appendix 4 for the recruitment and reminder emails). Recruited subjects will be also be screened for ability to read English, age (18 years of age or older) and education. Mall intercept participants will be additionally screened for ability to visually process the label (have reading glasses available if necessary). The target population is the adult noninstitutionalized population in the U.S. who self-report recent experience with or a diagnosis of insomnia (Study 1) or a diagnosis of high blood pressure (Study 2). The contractor will use quota sampling with the goal of yielding 130 respondents in each of 15 test conditions for a total of 5,850 completed interviews in the two studies. For the online sample in Studies 1 and 2, initial survey invitations will be sent to panel members in proportion to the 2010 National Health Inventory Survey's (NHIS) distribution of persons with insomnia or high blood pressure. Upon entry into the survey,

respondents will be screened for insomnia or high blood pressure (see screener). Only those panelists who have been diagnosed with or experienced symptoms of insomnia during the last month or who have been diagnosed with high blood pressure will continue with the survey. The contractor will perform a slow release of sample by sending email invitations containing the survey link to 10% of the total sample on the initial day of the field period. Additional invitations will be released in waves using varying proportions to account for different qualification and yield rates among the demographic groups of panel members. For the mall intercept sample in Study 1, participants will be recruited for participation in eight or more geographically dispersed malls. Malls will be selected to assure the respondent universe reflects varying degrees of education and other socioeconomic and ethnic variables. Participants will be intercepted in the selected malls' corridors and screened for eligibility in the study. Only those participants reporting insomnia will complete the survey. The goal will be to have a final sample with similar demographic proportions of insomnia and high blood pressure sufferers as seen in the 2010 NHIS data. The 2010 NHIS allows us to calculate the demographic proportions of insomnia and high blood pressure sufferers for gender, age, race, and Hispanic origin. We do not intend to make broad conclusionary statements about the results that describe persons with insomnia or high blood pressure generally.

After qualifying for the survey, each respondent will be randomly assigned to an experimental condition. Assignment to condition only after qualifying for the survey ensures equal and unbiased allocation of the respondents to experimental condition. Because the sample is not nationally representative, we do not intend to estimate population parameters (that is, we will not make statements such as "X% of insomnia sufferers in the US think X"). The goal is to achieve an

overall sample in proportion to the U.S. adult population with insomnia (Study 1) and high blood pressure (Study 2) on gender, age, race/ethnicity, education, and Hispanic origin.

Participants will be asked to participate in a study of new consumer product advertising that lasts no more than 20 minutes. Participants will be randomly assigned to ad type and incentive conditions. Each participant will see only one version of the ad.

2. **Procedures for Collection of Information**

Design Overview

Study 1: This study will examine type of promotional offer (*for example,* free trial offer; money off cost; money back guarantee; buy one, get one free; and no offer) in three types of drug advertisements (prescription drug full product, over-the-counter, and prescription drug reminder). The fictitious test product will treat insomnia and will be modeled on an actual drug used to treat this condition. Participants will be consumers who have insomnia or who self-identify as having met the diagnostic criteria for insomnia. Prescription drug full product advertisements contain information about both benefits and risks, OTC drug advertisements contain benefit information but not risk information, and prescription drug reminder advertisements do not contain either benefit or risk information.

Study 1 will be administered in two modes, online and mall-intercept, in order to assess the effects of mode on study results. The table below illustrates the design; the specific promotional offers examined will be determined through pretesting. Offers that demonstrate the most effect on perceptions of product efficacy and risk will be selected for the main study.

Study 1 is experimental in method: participants will be randomly assigned to read one ad version. After reading the ad, participants will answer a series of questions about the drug. We will

test how the offer type affects their recall of the benefit and risk information, their perceptions of the benefits and risks of the drug, their perceptions of the incentive, and their behavioral intention to look for more information about the product and try the product. We will also test how mode of administration (online versus mall intercept) affects these variables.

Table 5: Study 1 Design, Mode 1 (Online, Internet Panel)

	Type of Advertisement		
Promotional Offer (*examples*)	Efficacy and Risk (Prescription Full)	Efficacy only (OTC)	None (Prescription Reminder)
Free trial offer	Online	Online	Online
Buy one, get one free	Online	Online	Online
Money off cost	Online	Online	Online
Money back guarantee	Online	Online	Online
Control: No offer	Online	Online	Online

Table 6: Study 1 Design, Mode 2 (Mall Intercept)

	Type of Advertisement		
Promotional Offer (*examples*)	Efficacy and Risk (Prescription Full)	Efficacy only (OTC)	None (Prescription Reminder)
Free trial offer	Mall	Mall	Mall
Buy one, get one free	Mall	Mall	Mall
Money off cost	Mall	Mall	Mall
Money back guarantee	Mall	Mall	Mall
Control: No offer	Mall	Mall	Mall

Study 2: We propose to replicate the online mode design from Study 1 in a second medical condition, high blood pressure.

Table 7: Study 2 Design (Online, Internet Panel)

	Type of Advertisement		
Promotional Offer (*examples*)	Efficacy and Risk (Prescription Full)	Efficacy only (OTC)	None (Prescription Reminder)
Free trial offer	Online	Online	Online
Buy one, get one free	Online	Online	Online
Money off cost	Online	Online	Online
Money back guarantee	Online	Online	Online
Control: No offer	Online	Online	Online

The test product in Study 2 will be for the treatment of high blood pressure. Participants will be consumers who have been told by a healthcare professional that they have high blood pressure. As with Study 1, this study is experimental in method: participants will be randomly assigned to read one ad version. After reading the ad, participants will answer a series of questions about the drug. We will test how the offer type affects perceived efficacy, perceived risk, behavioral intention, and recall of the benefit and risk information.

Procedure

Study 1 will be administered over the internet and as a mall intercept. All parts of Study 2 will be administered over the internet. A total of 5,850 interviews will be completed. Participants will be randomly assigned to view one version of an advertisement. The prescription drug full product advertisement will consist of a display page and an accompanying brief summary page.

The prescription drug reminder ads and OTC ads will consist of one display page. Following their perusal of this document, they will answer questions about their recall of the benefit and risk information, their perceptions of the benefits and risks of the drug, their perceptions of the incentive, and their behavioral intention to look for more information about the product and try the product.

Demographic and numeracy information will be collected. In addition, participants will answer questions about their familiarity with their medical condition. The entire procedure is expected to last approximately 20 minutes. This will be a one-time (rather than annual) information collection.

Participants

Data will be collected using an Internet protocol (Studies 1 and 2) and mall intercept (Study 1). Approximately 3,900 consumers who have insomnia or self-identify as meeting the criteria and 1,950 consumers who have been told by a healthcare professional that they have high blood pressure will be recruited for the study. Because the task presumes basic reading abilities, all selected participants must speak and read English fluently. Participants must be 18 years or older (see attached screener in Appendix 2).

Hypotheses

Type of Offer Hypotheses

We will manipulate the type of offer such that each consumer will see either 1) no offer information or 2) one of four different types of offers.

1. Inclusion of an offer may affect intention to try the product but not perceived efficacy or safety. If the offer simply reduces the financial risk of trying the

product we expect to see differences between the offer conditions and no offer condition on behavioral intention but not measures of perceived efficacy or comparative efficacy.

2. Inclusion of an offer may affect intention to try the product **and** perceived efficacy or safety. If the offer functions as a heuristic or peripheral cue about product quality, we expect that participants who see an offer will differ from the no offer condition on ratings of perceived efficacy, comparative efficacy and behavioral intention, as well as measures of peripheral cue and inferences about the offer. Based on the work of Bhutada et al. (2009), we expect to see differences on variables related to efficacy but not risk. We will investigate differences between types of offers, but at this time these analyses are exploratory.

3. Inclusion of an offer may **not** affect perceived efficacy, safety or intentions. If participants do not process the offer at all, we expect to find no differences among conditions on our variables of interest (within ad types).

Type of Ad Hypotheses

4. Perceptions of product efficacy and safety may vary as a function of ad type. Because the prescription full product ad contains risk information whereas the OTC and prescription reminder ads do not, we expect participants in the prescription full product ad condition to have greater perceptions of risk and greater risk recall than participants in the OTC and prescription reminder ad conditions. Because the prescription full product ad and the OTC ad contain

benefit information whereas the prescription reminder ad does not, we expect participants in the prescription full product and OTC ad conditions to have greater perceptions of efficacy and greater benefit recall than participants in the prescription reminder ad condition.

Type of Offer * Type of Ad Hypotheses

5. Perceptions of product risk may vary as a function of ad type and offer. Even though the Bhutada et al. (2009) study found that offers did not affect risk perceptions within prescription full product ads, offers may affect risk perceptions in OTC and prescription reminder ads. The presence of risk information in the prescription full product ad may mitigate the effect of offers on risk perceptions by providing specific information on which to base an opinion. We expect that participants who view a prescription full product ad with an offer will show a small difference in risk perceptions relative to participants who view a prescription full product ad without an offer. On the other hand, we expect a larger difference in perceived risk between the offer and no offer conditions in the prescription reminder and OTC versions because, according to the Affect Heuristic (Slovic & Peters, 2006)[1], people perceive things that are more beneficial as less risky. Because preexisting beliefs about the safety and efficacy of prescription drugs relative to OTC drugs may drive responses, we will measure baseline beliefs about the efficacy and risk of prescription and OTC drugs and control for these beliefs when testing this hypothesis.

1 Slovic, P. & Peters, E. Risk perception and affect. (2006). Current Directions in Psychological Science, 15(6), 322-325.

Perceptions of product efficacy may also vary as a function of ad type and offer. Here we expect participants who view a prescription full product ad or an OTC ad with an offer will show a small difference in efficacy perceptions relative to participants who view a prescription full product ad or OTC ad without an offer. We expect a larger difference in perceived efficacy between the offer and no offer conditions in the prescription reminder ad version. We will also test for offer by ad type differences in behavioral intention, peripheral cue measures, and inferences about the offer but these comparisons are exploratory.

Mode Hypotheses

6. Results may differ by mode of survey administration. Past research has found differences between modes when one mode involves speaking to an interviewer, due to factors such as social desirability. Mall studies have moved toward a computer-based administration method to control this factor. In this study, participants in the mall and participants online will both complete the study on a computer. Accordingly, we may not see differences in results across modes. However, it is possible that *samples* recruited from an online panel differ from samples recruited from mall intercepts. For instance, if participants in malls are more coupon-prone, we may see more effects of offer in this group compared to participants recruited online. We will compare results across modes to test these hypotheses.

Coupon Proneness and Belief in the Quality-Price Relationship Hypotheses

7. Coupon Proneness and Belief in the Quality-Price Relationship may moderate the

effects predicted in Hypotheses 1-5. For example, those with higher coupon proneness may be more likely to focus on the offer and as a result be less likely to critically evaluate product information contained in an ad compared to participants who score low on this measure. Similarly, consumers who hold strong beliefs about the relationship between price and product quality (e.g., those who believe "you get what you pay for") may be less likely to critically evaluate product information. In this case participants who score higher on these two measures, compared to those who score lower, may be less likely to recall efficacy and safety information of products with an offer than products without an offer.

All other comparisons are exploratory.

Analysis Plan

The following analysis plan applies to both Study 1 and Study 2.

For hypotheses regarding ad type or offer type, we will conduct tests within each ad (offer) level as well as across ad (offer) levels (main effects). We will conduct ANOVAs or linear regressions to test our hypotheses. We will conduct ANOVAs and linear regressions both with and without covariates (e.g., demographic and health characteristics) included in the model. In addition, we will test whether effects are moderated by coupon proneness and belief in the quality-price relationship (see hypothesis 7). If a main effect is significant, we will conduct pairwise-comparisons to determine which conditions are significantly different from one another. We will also conduct planned comparisons in line with our hypotheses (see above).

Power

We have calculated the sample size for the pretests and study using power analysis. The following assumptions were made in deriving the sample size for the study: 1) 0.90 power, 2) 0.05 alpha, and 3) a small effect size. The tables below show the sample size required to detect differences with two different small effect sizes ranging from f = 0.10 to f = 0.15.

Table 8. Power Analysis Calculation: Main Study.

A priori power analysis to determine sample size needed in F tests (ANOVA: fixed effects, main effects, and interactions) to achieve power of 0.90 (Faul et al., 2007).[2]			
		Effect size f*	
Input			
		0.10	0.15
	α error probability	0.05	0.05
	Power (1 – β error probability)	0.90	0.90
	Numerator df	8	8
	Number of groups	15	15
Output			
	Critical F	1.94	1.94
	Denominator df	1,902	841
	Sample size per cell	**128**	**57**

*An effect size of 0.10 is traditionally considered small, whereas an effect size of 0.25 is considered medium (Cohen, 1988).[3] Here we have shown two different effect sizes centering around small effects.

In the main study, we will have 130 participants per cell, for a total of 5,850 participants in the 45 cells represented in the tables (three 3 x 5 designs). With this sample size, we will be able to detect small effects with a *p*-value of .05.

The following assumptions were made in deriving the sample size for the pretests: 1) 0.90 power, 2) 0.10 alpha, and 3) a small effect size. The tables below show the sample size required to detect differences with two different small effect sizes ranging from f = 0.10 to f = 0.15.

2 Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A, (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. Behavior Research Methods, 39, 175-191.
3 Cohen, J. (1988). Statistical power analysis for the behavioral sciences (2nd Ed). Hillsdale, NJ: Lawrence Erlbaum & Associates, Inc.

Pretest 1 will test the impact of different types of instructions in the questionnaire. This will be accomplished by varying attention (instructions to remember the details about the ad or no instruction about remembering details) and time limit (instructions that there is a time limit in which to view the ad or no instruction about time limit) in two promotional conditions (money back guarantee or no offer). Participants will be randomly assigned to view one version of the instructions.

Table 9. Power Analysis Calculation: Pretest 1

A priori power analysis to determine sample size needed in F tests (ANOVA: fixed effects, main effects, and interactions) to achieve power of 0.95.				
		Effect size f*		
Input				
		0.10	0.15	
	α error probability	0.10	0.10	
	Power (1 – β error probability)	0.90	0.90	
	Numerator df	1	1	
	Number of groups	16	16	
Output				
	Critical F	2.71	2.72	
	Denominator df	841	366	
	Sample size per cell	**54**	**24**	

In Pretest 1 we will have 31 participants in each of the 16 cells for a total of 560 participants.

Pretest 2 will be used to determine which offers will be selected for the study and test the availability of the ad (available for review or not available for review). Participants will be randomly assigned to one version of ad availability and to view one of seven different types of offers: Money Back Guarantee version 1, Money Back Guarantee version 2, Free 7 day trial, Free 30 day trial, $20 off cost of prescription, Buy one, get the next one free, or $20 off the cost of co-pay.

Table 10. Power Analysis Calculation: Pretest 2

A priori power analysis to determine sample size needed in F tests (ANOVA: fixed effects, main effects, and interactions) to achieve power of 0.95.				
		Effect size f*		
Input				
		0.10	0.15	
	α error probability	0.10	0.10	
	Power (1 – β error probability)	0.90	0.90	
	Numerator df	1	1	
	Number of groups	14	14	
Output				
	Critical F	2.71	2.72	
	Denominator df	843	368	
	Sample size per cell	**61**	**27**	

In Pretest 2 we will have 31 participants in each of the 14 cells for a total of 434 participants.

3. **Methods to Maximize Response Rates and Deal with Non-response**

Response rates can vary greatly depending on many factors including the sample composition, panel type, invitation content, time of day and incentive offering. In addition, outside factors including email filters, recipient ISP downtime and general conditions on the Internet can impact response rates. We will calculate response rate as ratio of the number of surveys completed to the number of panelists contacted by invitation. To help ensure that the participation rate for the internet panel is as high as possible, FDA and the contractor will:

- Design an experimental protocol that minimizes burden (short in length, clearly written, and with appealing graphics);
- Administer the experiment over the Internet, allowing respondents to answer questions at a time and location of their choosing;
- Sending out two email reminders after the initial invitation (see Attachment 4).
- Provide respondents with a helpdesk link that they can access at any time for assistance.

Additionally, the Panel leverages the social media concept and has developed 'panel communities' in order to maximize member engagement and overcome challenge of declining survey response rates and multi-panel membership.

This procedure has been reviewed and approved by FDA's human subject protection committee (RIHSC).

4. **Test of Procedures or Methods to be Undertaken**

Two types of pretesting will be employed as a test of procedures and methods. Cognitive testing on nine individuals will be used to refine study questions. Following cognitive testing, three rounds of quantitative pretesting will be employed. Each pretest will involve approximately 330 respondents. Pretest 1 will be used to determine the wording of the questionnaire instructions, pretest 2 will be used to determine the offer types used in the main study, and pretest 3 will be used as an overall test of procedures.

5. **Individuals Consulted on Statistical Aspects and Individuals Collecting and/or Analyzing Data**

The contractor, Synovate, Inc., will collect the information on behalf of FDA as a task order under Contract HHSF223200910136G. Zachary Lewis, Ph.D., is the Project Director for this project, 703-663-7235. Data analysis will be conducted primarily by the Research Team, Office of Prescription Drug Promotion (OPDP), Center for Drug Evaluation and Research (CDER), FDA, and coordinated by Kathryn J. Aikin, Ph.D., (COTR), FDA OPDP, WO BLDG 51, RM 3240, (301) 796-1200 and Helen W. Sullivan, Ph.D., M.P.H., WO BLDG 51, RM 3263, (301) 796-1200.