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The Effect of Direct to Consumer Advertising of Prescription Drugs on Elderly Adults

An Interactive Qualifying Project

submitted to the faculty of the

WORCESTER POLYTECHNIC INSTITUTE

in partial fulfillment of the requirements for the

Degree of Bachelor of Science

by

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Approved:

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Introduction

During the late 1960s and early 1970s, the FDA developed a new concept that would make a huge impact in the world of medicine. Patient package inserts or PPIs were created to further inform the patient of correct drug usage, but more importantly this marked a feeling of importance of delivering medical information to the public (Pines, 1999). The first PPI was for an isoproterenol inhaler in 1968 (Pines, 1999). The concept really began to take off with the introduction of birth control pills. In 1979, the FDA proposed that PPIs be mandatory for all prescription drugs, and in September of 1980, ten medications were fitted with PPIs (Pines, 1999). It was about this time that books on prescription drugs became available to the public. The Physician's Desk Reference was one of those books. It listed the official labeling for hundreds of prescription medications (Pines, 1999). After a surge of demand for health care information, fueled by increased consumer interest in the state of their health, the first direct to consumer advertisement for a prescription drug was introduced in 1981. It was for an ibuprofen product called Rufen (Pines, 1999). Shortly after, another advertisement appeared for the pneumonia vaccine, Pnumovax (Pines, 1999). The advertising was predicted by the FDA Commissioner to grow exponentially (Pines, 1999).

Concerns over the advertisements quickly arose. It was believed that the ads might have a negative impact on the consumer. One of the chief concerns was that the pharmaceutical industry's goal of maximizing profit might conflict with the health of the public. In 1982, the Commissioner demanded that the pharmaceutical industries stop their consumer advertising campaigns, so that the issues could be resolved (Pines, 1999). During the following two years, studies were done on the advertisements. One study showed that consumers retained more information about benefits than risks from a prescription drug advertisement (Morris and Millstein, 1984). It also found that print advertising was a better format for conveying risk information than TV or radio. In print ads, risk information can be read and understood at the readers' own pace. Information presented on TV or radio may not be fully processed. Lastly, it showed that consumers were hungry for more information about prescription drugs and would view the advertisements favorably (Pines, 1999). In 1985, the FDA lifted the moratorium on the advertisements with several guidelines set in place. Print advertisements were required to include a brief summary of risks and radio or television ads were required to include a major statement of risks. These ads were required to provide to the consumer a way to access full information of the advertised drug (Pines, 1999).

A plethora of ads followed. Many were vague and unspecific, urging viewers to talk to their doctor. Some commercials made it difficult to tell if the advertisement was for a prescription drug or for a product totally different from prescription drugs. This led the FDA to release a draft guidance in 1997 (Pines, 1999). According to these guidelines, adequate provision could be met by providing a telephone number, a website, a reference to a concurrently running print advertisement and a reference to asking a doctor or pharmacist for more information. The guidance of 1997, in part, allowed product-specific advertisements on television. Another draft guidance was released in August of 1999, two years after the original (Pines, 1999). Along with the shift to managed health care and the extensive amount of health information that was becoming readily available

to the public, direct to consumer advertising was empowering the consumer and increasing the demand for specific drugs.

By 1989, the amount spent on direct advertising to consumers was $12.3 million, $280,000 of which was being spent on television advertisements. Nine years later in 1998, the amount spent had increased to $1.17 billion, $579 million of which was being spent on television advertising. Eighty-six drugs were identified to be direct to consumer advertised (Pines, 1999). Between 1996 and 2002, total spending had increased by $1.7 billion. Television advertising had increased dramatically by this time. Twice as much was being spent on consumer print advertisements than on those print advertisements targeted to professionals. The 20 drugs in 2000 that received the highest amount of promotion accounted for 60% of the spending on advertisements (Rosenthal et al, 2002). In 2001, $2.7 billion was spent on direct to consumer advertising by the pharmaceutical industry. Between 1999 and 2000, the number of prescriptions dispensed for the top 50 selling drugs increased by 25% for those that were advertised and only 4% for those that were not advertised (Gahart et al, 2003).

The controversy surrounding direct to consumer advertising focuses on three points: cost, communication and public health (Chandra and Miller, 2005). Defenders believe that the advertisements are a source of empowerment for patients. They think that the ads provide information and educate the consumer about underdiagnosed or undertreated conditions. They deem the ads lead to compliance with drug regimens and introduce a competitive market so that consumers gain some independence in looking for the lowest costing drug being sold. The ads also contribute to better communication between patient and doctor (Chandra and Miller, 2005). Opponents think that the advertisements can be misleading, and fail to provide sufficient information on risks. They also believe that the ads put pressure on doctors to prescribe medication that may be unnecessary or inappropriate. The ads increase costs of health care and more emphasis is placed on the cure rather than prevention, contributing to a medicalisation of trivial ailments. There is a conflict between the industry's goal of maximizing profits and the welfare of the consumers (Chandra and Miller, 2005).

The aim of the present study is to gain further insight into the way direct to consumer advertising of prescription drugs affects the psychology of consumers, more specifically elderly consumers. Not much research has covered this topic, even though elderly consumers are one of the prescription drug companies' target audiences. One study done by Christensen and colleagues found that elderly participants who viewed advertisements that had a weak argument or a detailed risk statement stated they perceived the advertisements more negatively than those viewing a strong argument or those viewing a broad risk statement (Christensen, Ascione and Bagozzi, 1997). More involved advertisements were manipulated with a statement that told the study participants that the prototype ad would be expected to be released in the near future and their opinion would be vital for it to be released. In less involved ads, the statement read that the ad was not likely to appear in the future, so the opinion of the participants would have ultimately no impact on the release of the ad. Those that were exposed to the more involved ads tended to favor the product in the ad with the broad risk statement. The quality of the argument had a greater impact when the messages were attributed to more attractive expert sources with a strong argument enhancing response and a weak

argument reducing response (Christensen, Ascione and Bagozzi, 1997). Pertinent to the present study, risk statement may influence persuasion.

A second study completed by Datti and Carter examined how drug use in older adults is affected by direct to consumer advertising. Only a small percentage of the people surveyed who were over 75 responded to requesting a prescription drug from a doctor after seeing an advertisement (Datti and Carter, 2006). Yet another small percentage of those over 75 had actually received their request (Datti and Carter, 2006). A very small number of respondents over 75 who made no request or did not receive the drug they had asked for received another recommendation for alternative treatments (Datti and Carter, 2006). Adults who were over 75 years of age were 42% less likely to request a drug than those adults under 75 years of age (Datti and Carter, 2006). With increasing age, requests for specific prescription drugs as a result of direct to consumer advertising were more likely to receive other recommendations for treatments alternative to those requested. Those over 75 had a 251% increase in odds for receiving an alternative treatment recommendation rather than receiving the requested drug (Datti and Carter, 2006). These results are important to the present study because they show a lack of direct to consumer advertising of prescription drug based requests to physicians in adults over 75 compared to those under 75 years of age, as well as a reduction in the number of older adults receiving a prescription based on these requests.

A third study on the value of direct to consumer advertising of prescription drugs to physicians and of patients was done by Gohul and colleagues. They discovered that younger patients and those more motivated about health care viewed direct to consumer advertising of prescription drugs more favorably (Gohul, Carter and Wind, 2000). Older patients tended to view the advertisements in a less favorable light. Yet older adults tend to be more afflicted by chronic conditions and therefore should be more concerned and motivated about their health care. Another study looked at risk statement completeness and its effects on advertisement perception. Davis found that consumers were more likely to recommend or purchase drugs when the description was accompanied by an incomplete risk statement rather than a complete risk statement (Davis, 2000).

In a presentation done by Aiken, a 2002 survey revealed that 77% of patients had seen advertisements that made them aware of new drugs (Aiken, 2003). In a survey of physicians in the same year, the majority agreed somewhat that direct to consumer advertising of prescription medications makes patients more aware of possible treatments (Aiken, 2003). 17% of those physicians believed that the ads made the patients unnecessarily worry about their health (Aiken, 2003). A majority of physicians thought that direct to consumer advertising somewhat to a little creates anxiety about potential conditions (Aiken, 2003). More people were looking for information on the internet about health care than they have in the past. 86% of physicians surveyed had said that a patient of theirs had made a brand specific request for a prescription drug (Aiken, 2003). 88% of physicians in a survey said their patient had the condition the drug treated (Aiken, 2003). 57% had prescribed the drug (Aiken, 2003). The results of the survey indicated that people were aware of the advertisements which had made the consumers aware of new conditions. Some believe that increased anxiety is created and this may affect patients in motivating them to request an advertised drug. Awareness may lead to motivation. Also a little more than half had actually received a prescription for their request.

In the present study it is intended to administer a survey to people over 65 years of age. The survey will consist of two parts, one asking general questions on familiarity with direct to consumer advertisements of prescription drugs. The second part will focus on questions regarding an actual magazine advertisement for the cholesterol lowering drug, Zetia. Based on these studies, two hypotheses were formulated. *Hypothesis 1*: if the elderly respondents indicate familiarity with prescription drug advertisements, then they will be more likely to have requested an advertised prescription drug from their doctor. *Hypothesis 2*: if the respondents indicate that they were persuaded by the presented advertisement, then they will be more likely to indicate a desire to make a request to their doctor about the medication being advertised. The present study intends to show on what level advertisements are achieving their goal in creating product awareness and demand and how patients perceive advertisements.

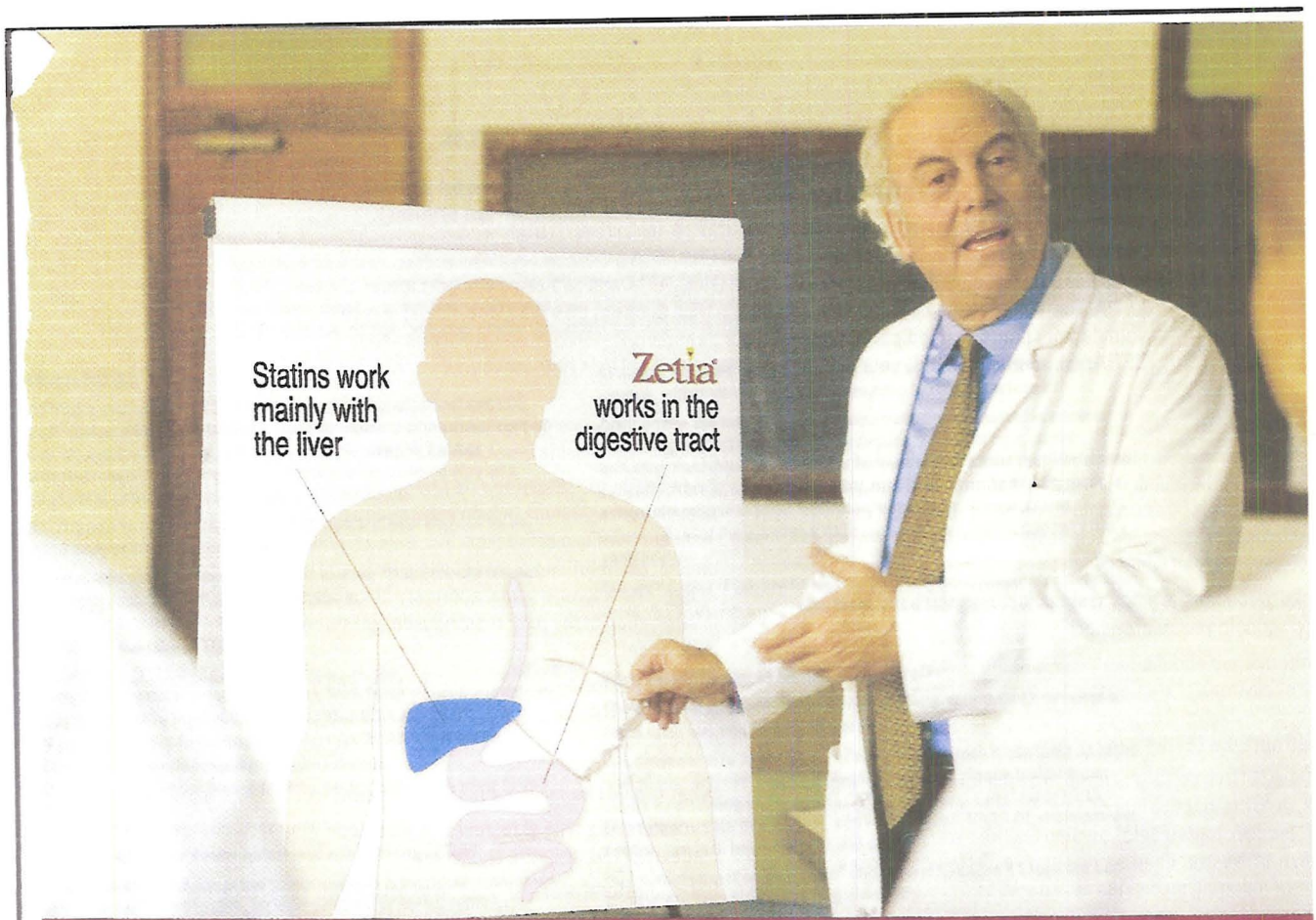
Methods

The primary target population was the elderly attendees at the Gardner, Massachusetts Senior Center. The center is a location where active elderly adults are able to participate in various activities, such as lunch that is served every weekday, bingo and pool. The survey was administered just prior to when lunch was served at the center. The participants were situated in the main function room of the center containing approximately 10 round tables that sat about 6 to 8 persons each. Instructions were given at each table by the researcher. Each participant was given unlimited time to complete the survey. A total of 20 people who were seated for lunch were given a survey. The survey was also given to 2 other participants who were playing a game of pool in the adjacent room. They were informed of the survey directions separately from the rest of the group. The population was limited to attendees at the Gardner Senior Center, with an age range of 65 and older. A total of 22 surveys were administered to the senior center attendees.

Before completing the survey, each participant was asked to read and sign an informed consent form. After completing the consent form, he or she was asked to fill out a very short demographic survey that requested the participants' age, sex and whether or not he or she was covered by health insurance. The respondents were then asked 4 basic questions relating to direct to consumer advertising in general: 1) are you taking any prescription medications; 2) are you familiar with prescription drug advertisements on the television, radio or in magazines; 3) have you ever made a request to your doctor regarding a drug mentioned in one of these ads; and 4) were you prescribed this drug after making such a request. The questions were aimed at gathering basic information on the participants' prior experiences with direct to consumer advertising. This part of the survey intended to collect information on familiarity and past direct to consumer prescription drug advertisement based requests. The data obtained from these two questions was important in finding possible support for the first hypothesis.

In the second part of the survey, participants were asked four questions based on a magazine advertisement for Zetia (see Figure 1 and 2), a cholesterol lowering drug that mainly works with the digestive tract rather than the liver like statins. They were asked: 1) if they had seen an ad similar to the ad for Zetia; 2) how comfortable they were with the medication after reading the risks associated with the medication (very comfortable, somewhat comfortable, somewhat uncomfortable, very uncomfortable); 3) how would they rank the credibility of the doctor in the picture (very credible, somewhat credible, somewhat not credible, very not credible); 4) how likely they would be to ask their doctor about this medication (very likely, somewhat likely, somewhat unlikely, very unlikely); 5) how reliable they thought the advertisement was (very reliable, somewhat reliable, somewhat unreliable, very unreliable); and 6) if they were persuaded that Zetia was better than statins as a cholesterol lowering medication or not. The questions were designed to gain insight into the perception of different aspects of direct to consumer advertisements after viewing a specific advertisement. The two questions of primary interest were questions 6 and 4, on persuasion and likelihood of making a request to a doctor for Zetia, respectively. The data obtained from these two questions was important in discovering possible validation for the second hypothesis.

Chi square tests were done between dichotomous variable data sets (questions involving gender or yes-no answers) to either accept or reject the null hypothesis which was that there is no correlation between sets of data. A count was completed to determine the number of yes-yes answers, yes-no answers, no-yes answers, and no-no answers (male-yes, male-no, female-yes, and female-no when comparing gender and yes-no answers). Then expected values were computed by multiplying totals per row by totals per column and dividing by the total number of participants. Next, the formula, $x^2=\sum (o-e)^2/e$, where o is the observed value and e is the expected value, was used. The value of x^2 was compared to a table of chi squared values to determine the probability that the observed result was different from the expected result by chance. Comparisons between multiple answer data sets (questions involving a 1 through 4 answer) were plotted on a scatter plot in Microsoft Excel and the correlation coefficient (r^2) was found by displaying a linear regression line with the coefficient. This was carried out to evaluate if there was any significant correlated relationship between multiple answer data values. More chi square tests were completed between all dichotomous variable data sets and all multiple answer data sets. The same procedure that was used in computing the chi squares for dichotomous variable sets was executed except a count was done among the number of yes-1, yes-2, yes-3, yes-4, no-1, no-2, no-3, and no-4 answers (male-1, male-2, male-3, male-4, female-1, female-2, female-3, and female-4 answers in the case of gender compared to multiple variable sets).



Looking for a Different Way to Help Lower Cholesterol?

Then look here. Statins, the most common cholesterol-lowering medicines, are a good option. ZETIA is different. That's because, unlike statins, which work mainly with the liver, ZETIA works in the digestive tract, where the food is. There are some other cholesterol-lowering medicines that work in the digestive tract, but ZETIA is unique in the way it helps block the absorption of cholesterol that comes from food.

A healthy diet and exercise are important, but sometimes they're not enough to get your cholesterol where it needs to be. ZETIA complements those efforts, and when added to a healthy diet, is proven to lower bad (LDL) cholesterol by as much as 30 points—about 18%* These are average results. Individual results may vary. You should continue to eat right and stay active. But if that's not enough, **ask your doctor if ZETIA is right for you.**

*In a study, starting from an average bad cholesterol of 167 mg/dL.

ZETIA has not been shown to prevent heart disease or heart attacks.

Important information: ZETIA is a prescription medicine and should not be taken by people who are allergic to any of its ingredients. If you have ever had liver problems, are nursing or pregnant or may become pregnant, a doctor will decide if ZETIA alone is right for you.

Unexplained muscle pain or weakness could be a sign of a rare but serious side effect and should be reported to your doctor right away. Common side effects included stomach pain and feeling tired.

ZETIA works in the digestive tract and is unique in the way it helps block the absorption of cholesterol that comes from food.

Zetia® (ezetimibe) Tablets

ZETIA® (ezetimibe) Tablets

Patient Information about ZETIA (zĕt´-ē-ă)

Generic name: ezetimibe (ĕ-zĕt´-ĕ-mīb)

Read this information carefully before you start taking ZETIA and each time you get more ZETIA. There may be new information. This information does not take the place of talking with your doctor about your medical condition or your treatment. If you have any questions about ZETIA, ask your doctor. Only your doctor can determine if ZETIA is right for you.

What is ZETIA?

ZETIA is a medicine used to lower levels of total cholesterol and LDL (bad) cholesterol in the blood. It is used for patients who cannot control their cholesterol levels by diet alone. It can be used by itself or with other medicines to treat high cholesterol. You should stay on a cholesterol-lowering diet while taking this medicine.

ZETIA works to reduce the amount of cholesterol your body absorbs. ZETIA does not help you lose weight.

For more information about cholesterol, see the "What should I know about high cholesterol?" section that follows.

Who should not take ZETIA?

- Do not take ZETIA if you are allergic to ezetimibe, the active ingredient in ZETIA, or to the inactive ingredients. For a list of inactive ingredients, see the "Inactive ingredients" section that follows.
- If you have active liver disease, do not take ZETIA while taking cholesterol-lowering medicines called statins.
- If you are pregnant or breast-feeding, do not take ZETIA while taking a statin.

What should I tell my doctor before and while taking ZETIA?

Tell your doctor about any prescription and non-prescription medicines you are taking or plan to take, including natural or herbal remedies.

Tell your doctor about all your medical conditions including allergies.

Tell your doctor if you:

- ever had liver problems. ZETIA may not be right for you.
- are pregnant or plan to become pregnant. Your doctor will decide if ZETIA is right for you.
- are breast-feeding. We do not know if ZETIA can pass to your baby through your milk. Your doctor will decide if ZETIA is right for you.
- experience unexplained muscle pain, tenderness, or weakness.

How should I take ZETIA?

- Take ZETIA once a day, with or without food. It may be easier to remember to take your dose if you do it at the same time every day, such as with breakfast, dinner, or at bedtime. If you also take another medicine to reduce your cholesterol, ask your doctor if you can take them at the same time.
- If you forget to take ZETIA, take it as soon as you remember. However, do not take more than one dose of ZETIA a day.
- Continue to follow a cholesterol-lowering diet while taking ZETIA. Ask your doctor if you need diet information.
- Keep taking ZETIA unless your doctor tells you to stop. It is important that you keep taking ZETIA even if you do not feel sick.

See your doctor regularly to check your cholesterol level and to check for side effects. Your doctor may do blood tests to check your liver before you start taking ZETIA with a statin and during treatment.

What are the possible side effects of ZETIA?

In clinical studies patients reported few side effects while taking ZETIA. These included stomach pain and feeling tired.

Very rarely, patients have experienced severe muscle problems while taking ZETIA, usually when ZETIA was added to a statin drug. If you experience unexplained muscle pain, tenderness, or weakness while taking ZETIA, contact your doctor immediately. You need to do this promptly, because on rare occasions, these muscle problems can be serious, with muscle breakdown resulting in kidney damage.

Additionally, the following side effects have been reported in general use: allergic reactions (which may require treatment right away) including swelling of the face, lips, tongue, and/or throat that may cause difficulty in breathing or swallowing, rash, and hives; joint pain; muscle aches; alterations in some laboratory blood tests; liver problems; inflammation of the pancreas; nausea; gallstones; inflammation of the gallbladder.

Tell your doctor if you are having these or any other medical problems while on ZETIA. For a complete list of side effects, ask your doctor or pharmacist.

What should I know about high cholesterol?

Cholesterol is a type of fat found in your blood. Your total cholesterol is made up of LDL and HDL cholesterol.

LDL cholesterol is called "bad" cholesterol because it can build up in the wall of your arteries and form plaque. Over time, plaque build-up can cause a narrowing of the arteries. This narrowing can slow or block blood flow to your heart, brain, and other organs. High LDL cholesterol is a major cause of heart disease and stroke.

HDL cholesterol is called "good" cholesterol because it keeps the bad cholesterol from building up in the arteries.

Triglycerides also are fats found in your blood.

General Information about ZETIA

Medicines are sometimes prescribed for conditions that are not mentioned in patient information leaflets. Do not use ZETIA for a condition for which it was not prescribed. Do not give ZETIA to other people, even if they have the same condition you have. It may harm them.

This summarizes the most important information about ZETIA. If you would like more information, talk with your doctor. You can ask your pharmacist or doctor for information about ZETIA that is written for health professionals.

Inactive ingredients:

Croscarmellose sodium, lactose monohydrate, magnesium stearate, microcrystalline cellulose, povidone, and sodium lauryl sulfate.

Issued July 2005

MERCK / Schering-Plough Pharmaceuticals

Manufactured for:
Merck/Schering-Plough Pharmaceuticals
North Wales, PA 19454, USA

By:
Schering Corporation
Kenilworth, NJ 07033, USA
or
Merck & Co., Inc.
Whitehouse Station, NJ 08889, USA

REV 08 29480800T

Printed in USA. 20551420(1)(800)-ZET

Figures 1 and 2: Front and back of Zetia ad

Results:

Out of the 22 surveys that were issued, 19 were completed. The average age of the participants was 78.89. Twelve were male and seven were female (see Figure 3). All respondents were covered by some form of health insurance (see Figure 3). Seventeen were currently using at least one prescription medication (see Figure 4). Thirteen were familiar with direct to consumer advertising of prescription medications (see Figure 5). Seventeen had not made requests for prescription medications to a doctor after seeing an advertisement (see Figure 6). Out of the two that had made such requests, only one had this request granted (see Figure 7). Less than half of the respondents were familiar with ads like the sample ad for Zetia (see Figure 8). Only four respondents indicated that they were persuaded by the ad for Zetia (see Figure 13). Looking at Figure 9, the majority of the participants responded that they were somewhat comfortable with the risk statement. In Figure 10, most participants answered that they believed the doctor in the Zetia ad to be somewhat not credible. The majority of participants said that they were very unlikely to ask their doctor for Zetia (see Figure 11). Most participants responded that they believed the ad to be somewhat unreliable (see Figure 12).

Chi square tests completed between gender and whether or not participants were taking prescriptions, gender and whether or not participants was familiar with direct to consumer prescription drug ads, gender and whether or not participants made ad based requests for prescriptions to a doctor, gender and whether or not the request was fulfilled, all revealed insignificant p-values (see Table 1). Gender and whether or not participants were persuaded by the Zetia ad, gender and level of comfort of the risk statement in the Zetia ad, gender and the ranking of credibility of the doctor in the Zetia ad, and gender and ranking of reliability of the Zetia ad all resulted in insignificant p-values as well (see Table 2). Males were more significantly more likely than females to have not seen similar ads to Zetia. Male participants were significantly more likely request Zetia from a doctor after seeing the ad ($p < 0.10$) (see Table 2).

All relationships involving whether or not participants were currently taking prescription medications were shown to have no correlation (see Tables 1 and 2). Links between whether or not participants were familiar with prescription drug ads and multiple answer questions in the second part of the survey (level of comfort with Zetia risk statement, ranking of credibility of doctor in Zetia ad, likelihood or making a request for Zetia, and ranking of reliability of Zetia ad) were insignificant (see Table 2). Being familiar with prescription drug ads was also not shown to be correlated with having made an ad based request to a doctor in the past (see Table 1). Those who were familiar with prescription drug advertisements were significantly more likely to have seen advertisements similar to the one for Zetia. Those who were familiar with prescription drug advertisements were significantly more likely to not be persuaded by the Zetia. Those that were familiar with prescription drug advertisements were also significantly more likely to not make a prescription drug request to a doctor after viewing a drug ad. These relationships were significant ($p < 0.10$) (see Table 1).

Those participants that had not made a request to a doctor for a specific drug from an advertisement were significantly more likely to think that the Zetia ad was not reliable. (see Table 2). All other relationships involving whether or not participants had made an ad based request to a doctor were found to have no correlation (see Tables 1 and 2).

Associations between whether or not participants had seen ads similar to Zetia and whether or not participants were persuaded by Zetia had no significance (see Table 1). Those who had not had their ad based request granted by a doctor were significantly more likely to think the doctor pictured in the Zetia ad was not credible when $p < 0.10$. (see Table 2). All other links were insignificant (see Tables 1 and 2). After the scatter plots were made (see Figures 14, 15, 16, 17, 18 and 19), all correlation coefficients were found to be too small for any relationship to be significant, yet they were all positive in value. Values for the coefficients can be located in Table 3.

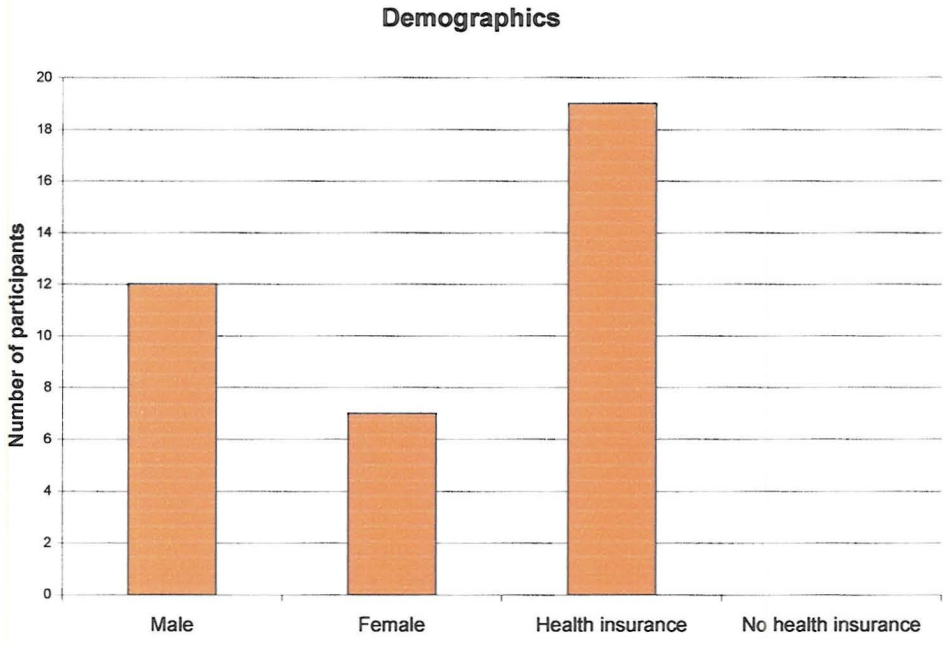


Figure 3: Demographic data of survey participants.

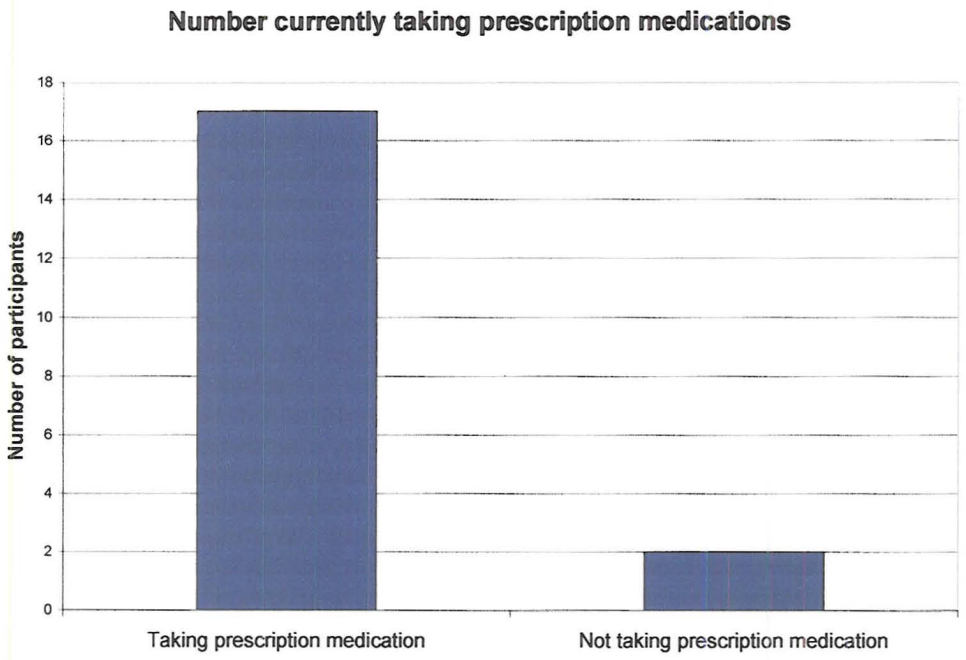


Figure 4: Number of survey participants who indicated that they were taking at least one prescription medication at the time of the survey's administration.

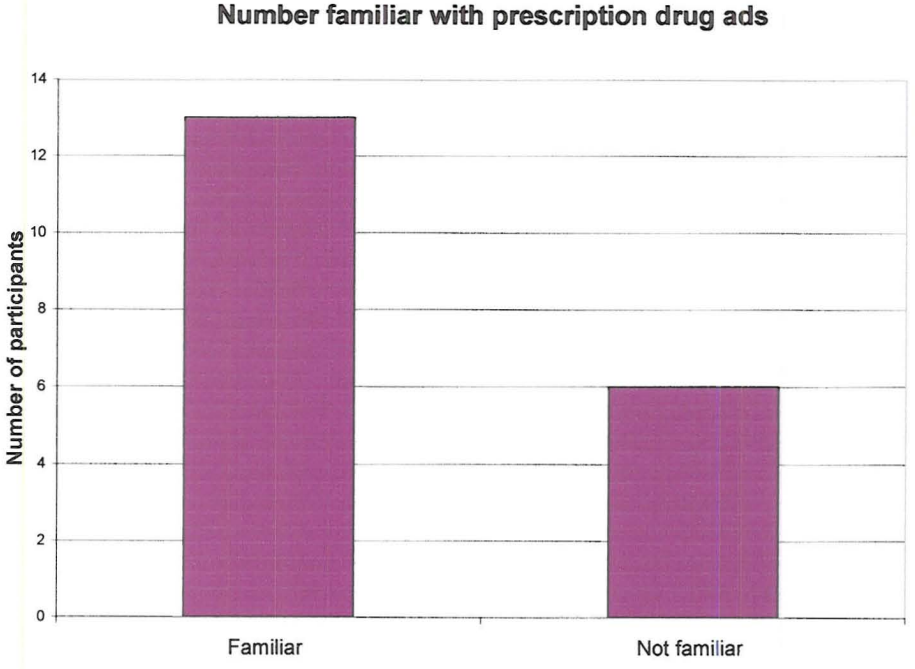


Figure 5: Number of survey participants who were familiar with prescription drug advertising.

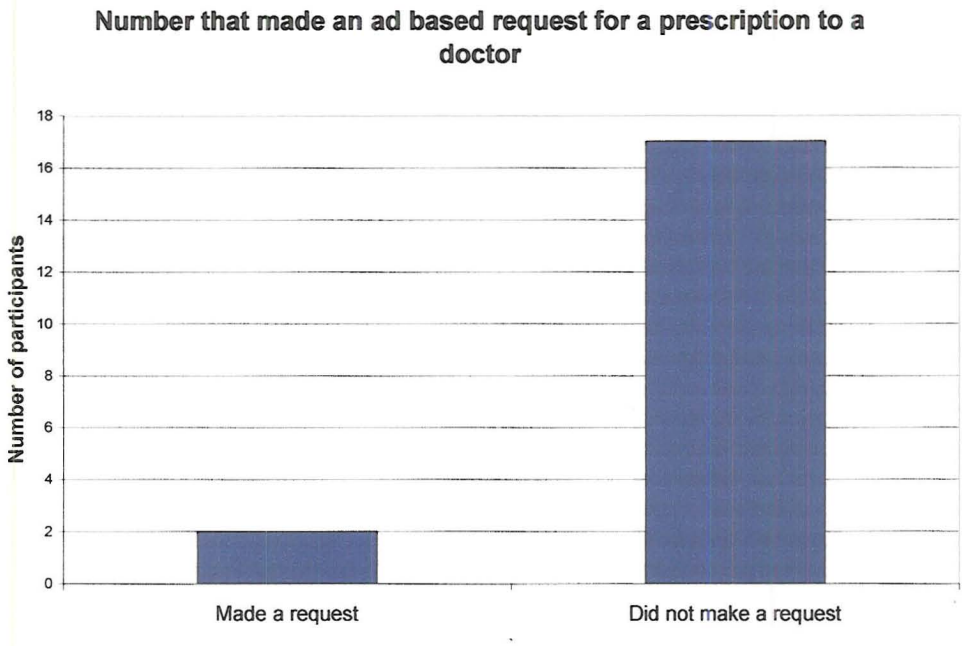


Figure 6: Number of survey participants who had made a request to a doctor for a specific prescription medication after viewing an advertisement for that specific medication.

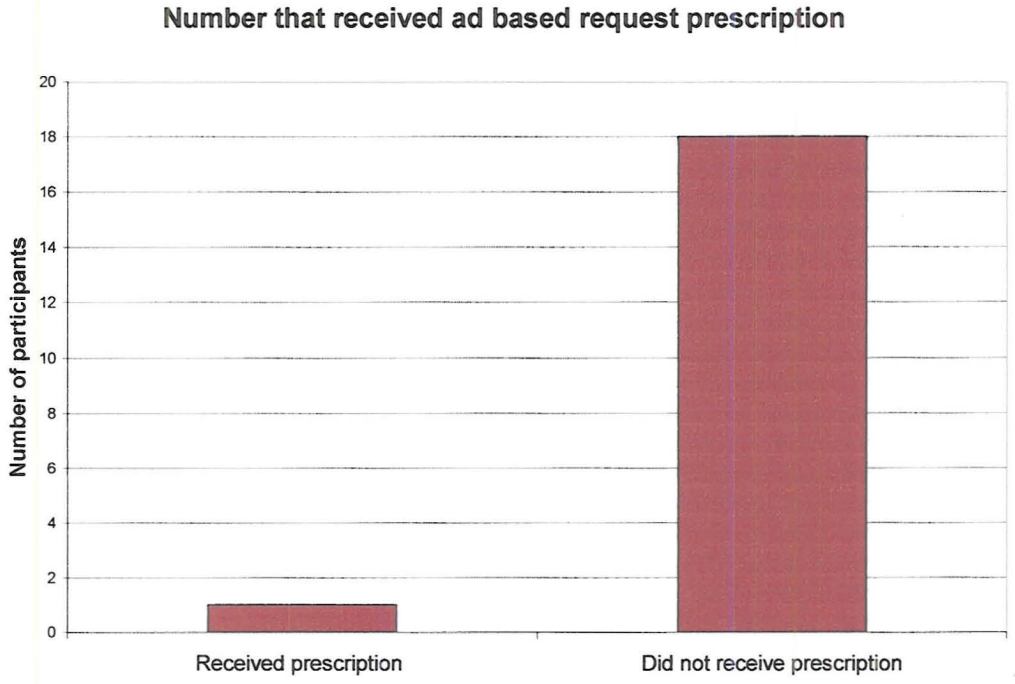


Figure 7: Number of survey participants who had received their prescription upon requesting it from their doctor after seeing an advertisement for that prescription. Note that since the majority of participants had not made a request to begin with, the majority of responses to this question were subsequently no as well.

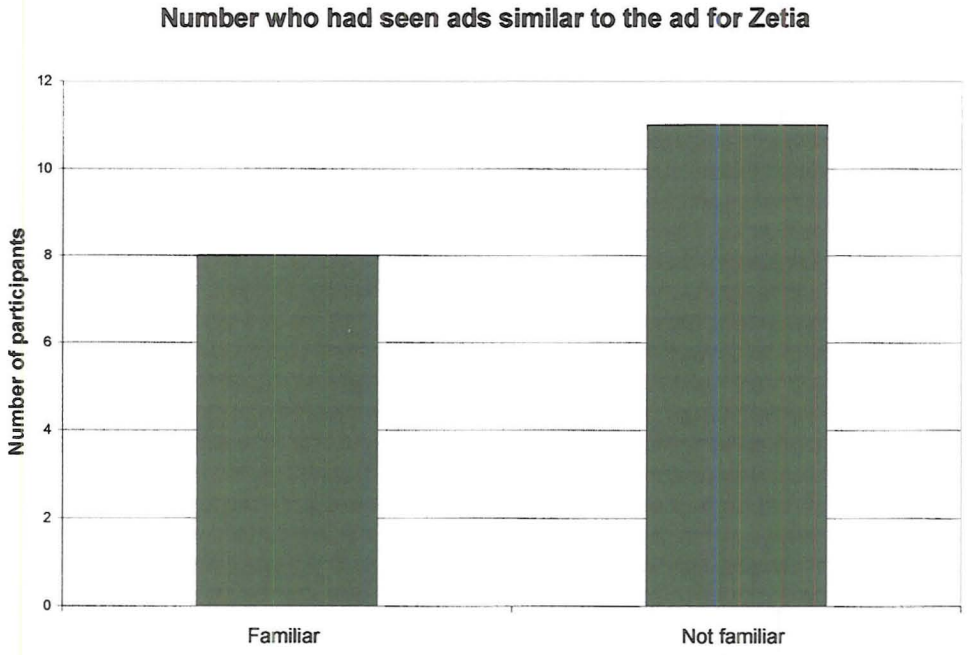


Figure 8: Number of survey participants who indicated that they were had seen ads similar to the advertisement for Zetia.

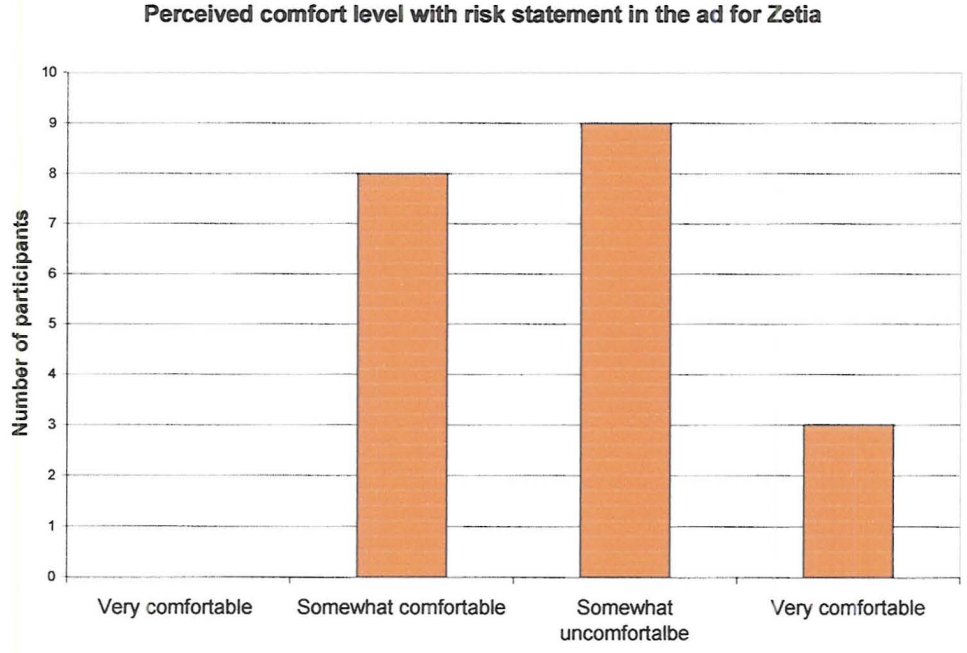


Figure 9: A distribution of how comfortable survey participants were with the risk statement in the Zetia ad.

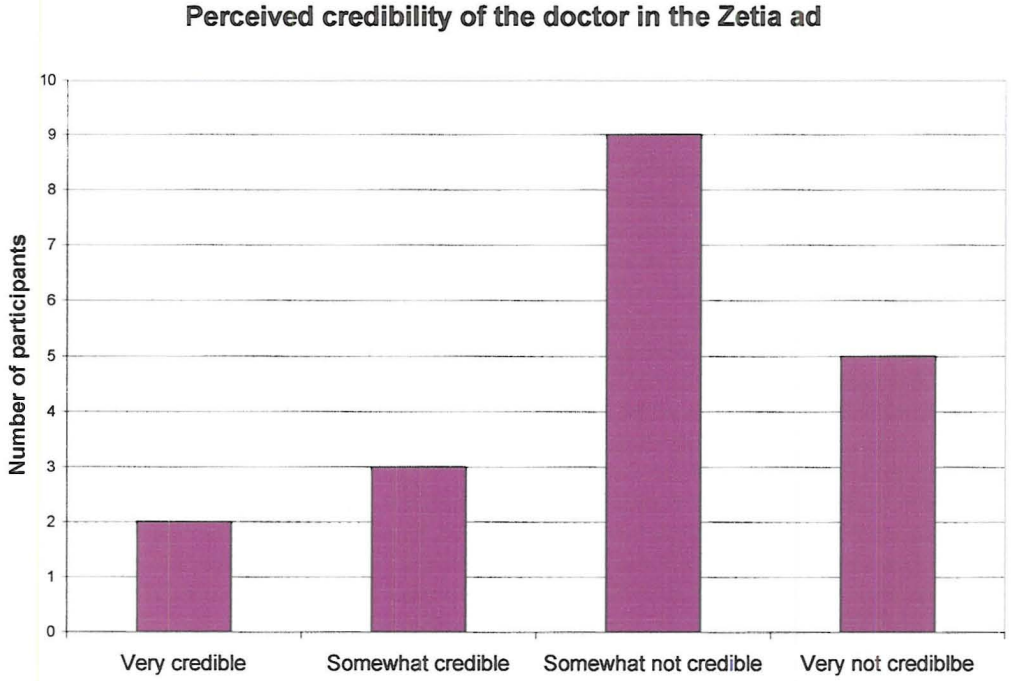


Figure 10: A distribution of how survey participants ranked the credibility of the doctor in the picture in the ad for Zetia.

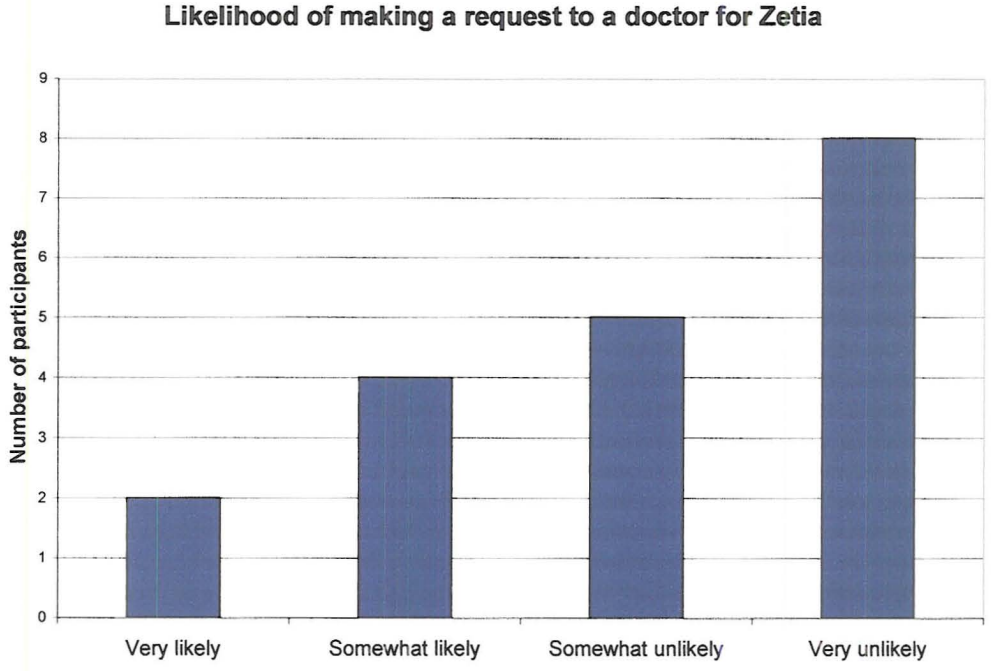


Figure 11: A distribution of how likely survey participants would be to request Zetia from a doctor after reading the ad.

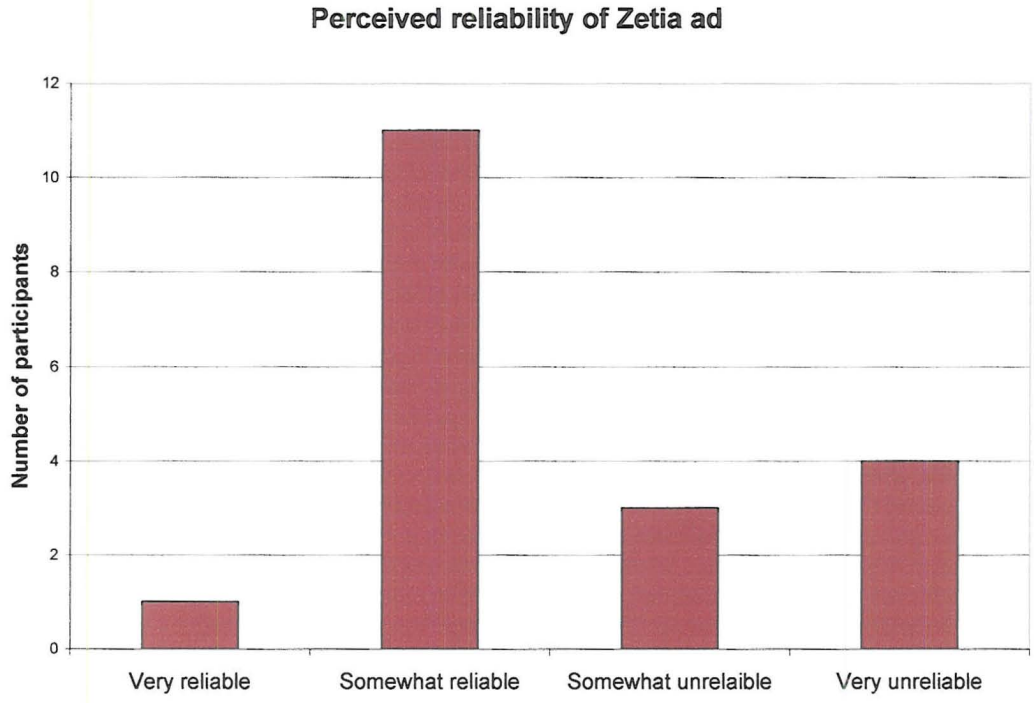


Figure 12: A distribution of how survey participants rated the reliability of the ad for Zetia.

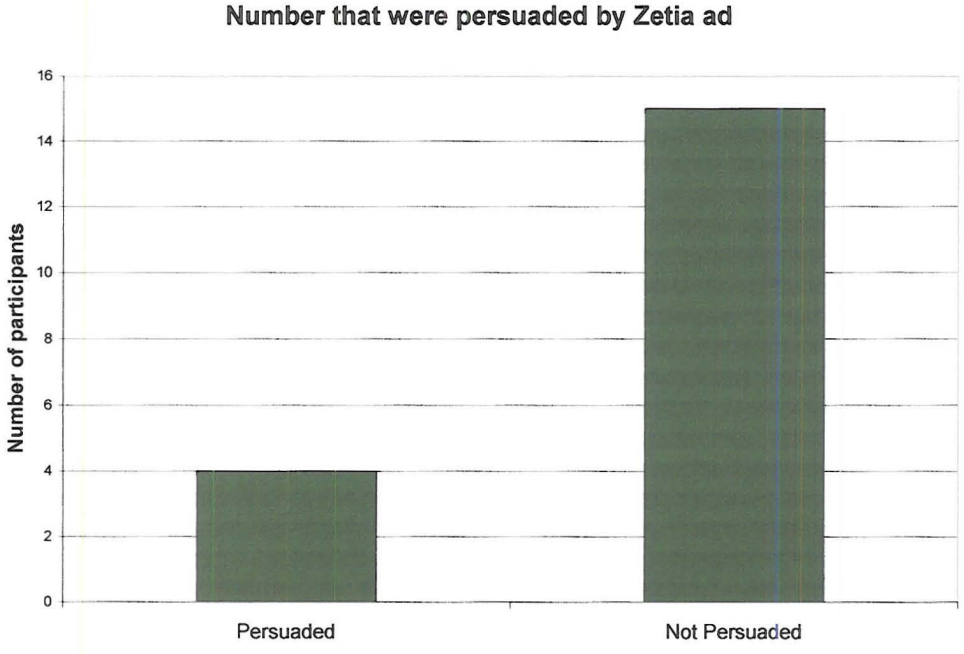


Figure 13: Number of survey participants who were persuaded that Zetia is a better cholesterol-lowering drug than statins.

Table 1: Chi square values for relationships between questions with dichotomous answers.

Relationship	Chi Square
Gender vs. taking prescriptions	0.164
Gender vs. being familiar	1.532
Gender vs. having made an ad based request	0.164
Gender vs. having ad based request granted	0.622
Gender vs. having seen similiar ads to Zetia	6.026~
Gender vs. being persuaded by Zetia ad	0.351
Taking prescriptions vs. being familiar	0.354
Taking prescriptions vs. having made an ad based request	0.263
Taking prescriptions vs. having ad based request granted	0.131
Taking prescriptions vs. having seen similar ads to Zetia	1.092
Taking prescriptions vs. being persuaded by Zetia ad	2.993
Being familiar vs. having made an ad based request	6.545~
Being familiar vs. having ad based request granted	0.496
Being familiar vs. having seen similar ads to Zetia	6.39~
Being familiar vs. being persuaded by Zetia ad	6.95~
Having made an ad based request vs. having ad based request granted	8.565*
Having made an ad based request vs. having seen similar ads to Zetia	0.053
Having made an ad based request vs. being persuaded by Zetia ad	0.595
Having ad based request granted vs. having seen similar ads to Zetia	0.712
Having ad based request granted vs. being persuaded by Zetia ad	0.553
Having seen similar ads to Zetia vs. being persuaded by Zetia ad	0.6

~significant at $p<0.10$
*significant at $p<0.05$

Table 2: Chi square values for relationships between questions with dichotomous and multiple answers.

Relationship	Chi Square
Gender vs. comfort with Zetia risk statement	2.355
Gender vs. crediblity of doctor in Zetia ad	3.557
Gender vs. likelihood of requesting Zetia from doctor	8.59~
Gender vs. reliability of Zetia ad	3.52
Taking prescriptions vs. comfort with Zetia risk statement	0.422
Taking prescriptions vs. credibility of doctor in Zetia ad	1.75
Taking prescriptions vs. likelihood of requesting Zetia from doctor	0.211
Taking prescriptions vs. reliability of Zetia ad	3.156
Being familiar vs. comfort with Zetia risk statement	5.588
Being familiar vs. credibility of doctor in Zetia ad	3.157
Being familiar vs. likelihood of requesting Zetia from doctor	0.842
Being familiar vs. reliability of Zetia ad	2.605
Having made an ad based request vs. comfort with Zetia risk statement	3.078
Having made an ad based request vs. credibility of doctor in Zetia ad	4.392
Having made an ad based request vs. likelihood of requesting Zetia from doctor	4.434
Having made an ad based request vs. reliability of Zetia ad	11.94*
Having been granted ad based request vs. comfort with Zetia risk statement	1.228
Having been granted ad based request vs. credibility of doctor in Zetia ad	8.993~
Having been granted ad based request vs. likelihood of requesting Zetia from doctor	1.451
Having been granted ad based request vs. reliability of Zetia ad	5.657
Having seen similar ads to Zetia vs. comfort with Zetia risk statement	0.29
Having seen similar ads to Zetia vs. credibility of doctor in Zetia ad	1.832
Having seen similar ads to Zetia vs. likelihood of requesting Zetia from doctor	3.787
Having seen similar ads to Zetia vs. reliability of Zetia ad	1.761
Being persuaded by Zetia ad vs. comfort with Zetia risk statement	2.536
Being persuaded by Zetia ad vs. credibility of doctor in Zetia ad	4.913
Being persuaded by Zetia ad vs. likelihood of requesting Zetia from doctor	3.006
Being persuaded by Zetia ad vs. reliability of Zetia ad	2.552

~significant at $p<0.10$
*significant at $p<0.05$

Table 3: Correlation coefficient values for relationships between questions with multiple answers.

Relationship	r2
Comfort with risk statement vs. credibility of doctor	0.0969
Comfort with risk statement vs. likelihood of requesting Zetia	0.0187
Comfort with risk statement vs. reliability of Zetia ad	0.0187
Credibility of doctor vs. likelihood of requesting Zetia	0.0977
Credibility of doctor vs. reliability of Zetia ad	0.1646
Likelihood of requesting Zetia vs. reliability of Zetia ad	0.2748

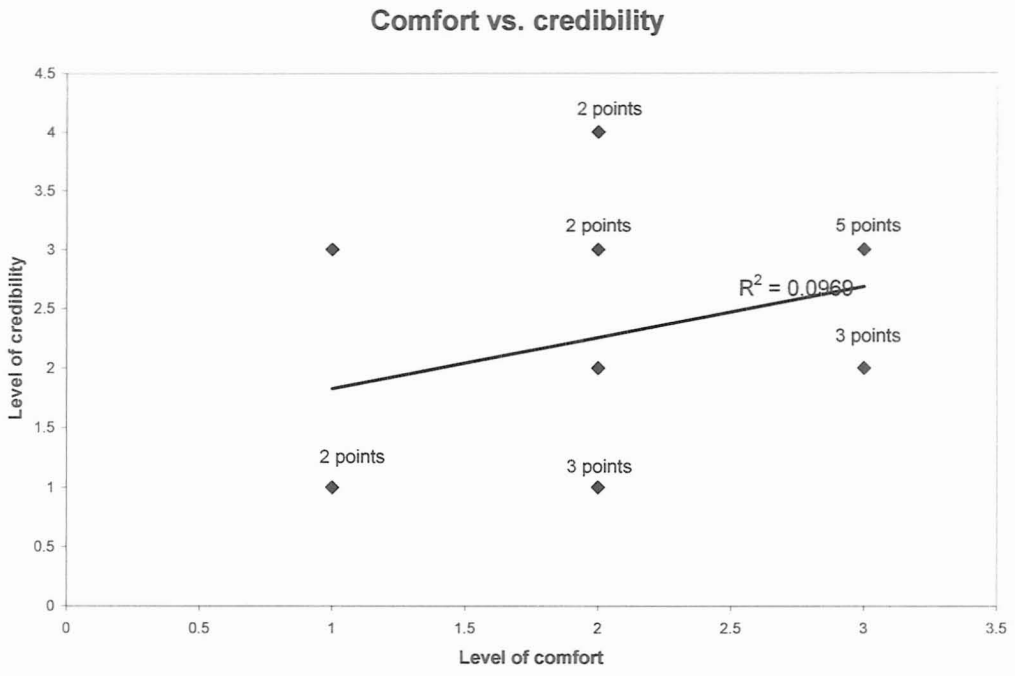


Figure 14: Correlation between indicated level of comfort with the risk statement in the Zetia ad and indicated ranking of credibility of the doctor in the picture in the ad for Zetia.

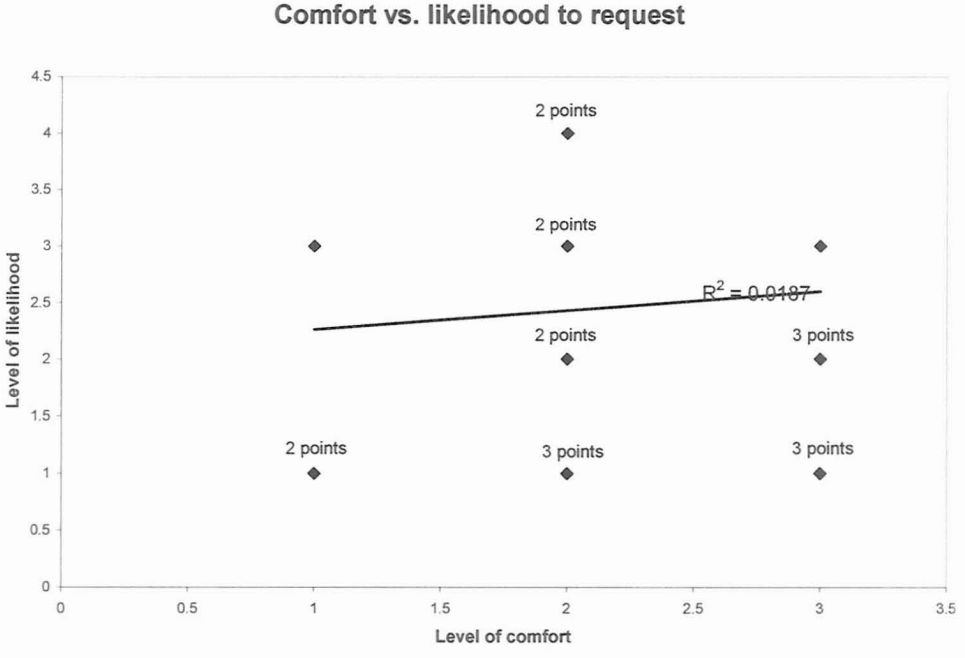


Figure 15: Correlation between indicated level of comfort with the risk statement in the Zetia ad and indicated level of likelihood of making a request for Zetia to a doctor.

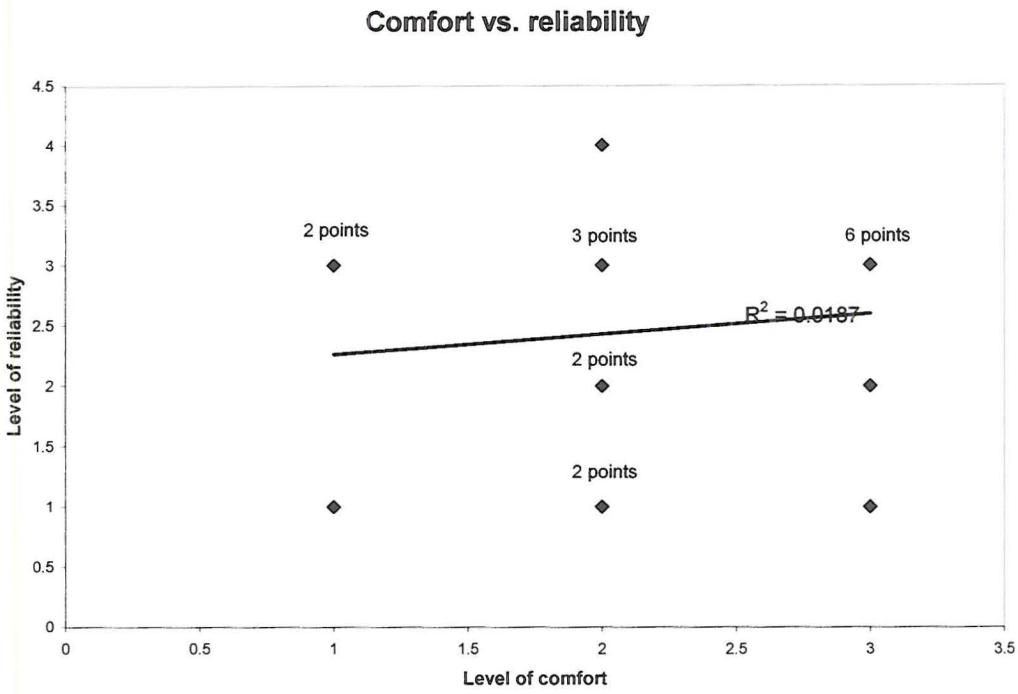


Figure 16: Correlation between indicated level of comfort with the risk statement in the Zetia ad and indicated rating of the reliability of the Zetia ad.

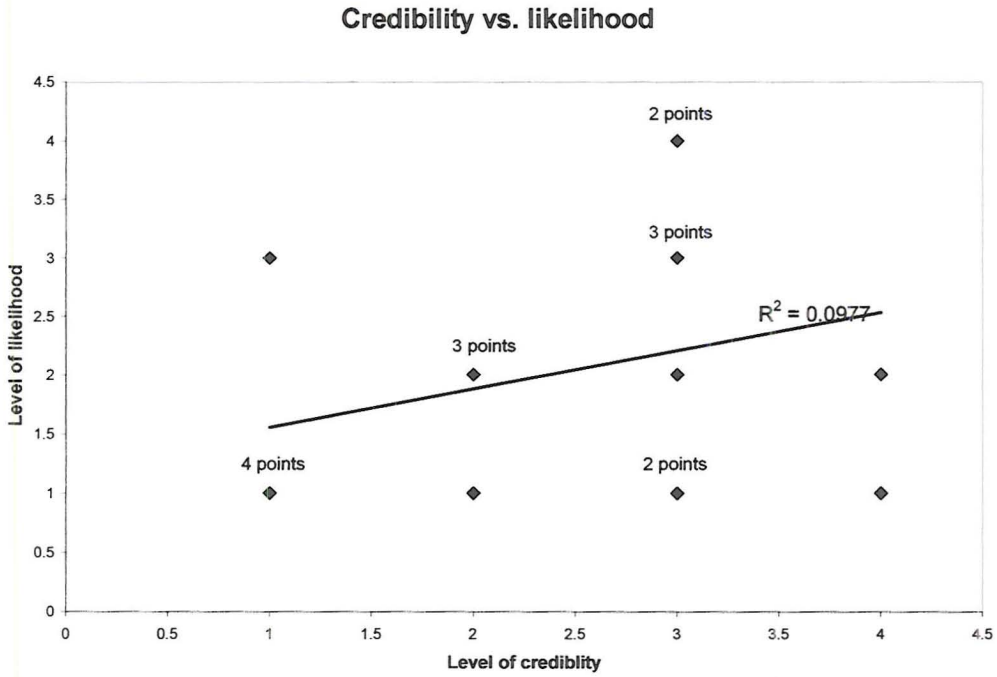


Figure 17: Correlation between indicated ranking of credibility of the doctor in the picture in the Zetia ad and indicated level of likelihood of making a request for Zetia to a doctor.

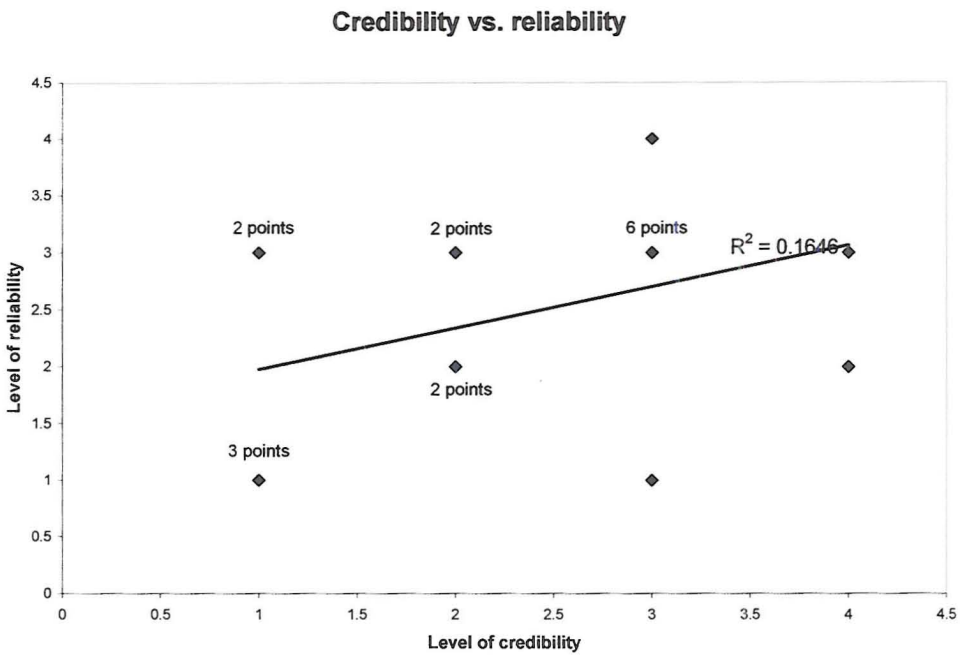


Figure 18: Correlation between indicated ranking of credibility of the doctor in the picture in the Zetia ad and indicated rating of the reliability of the Zetia ad.

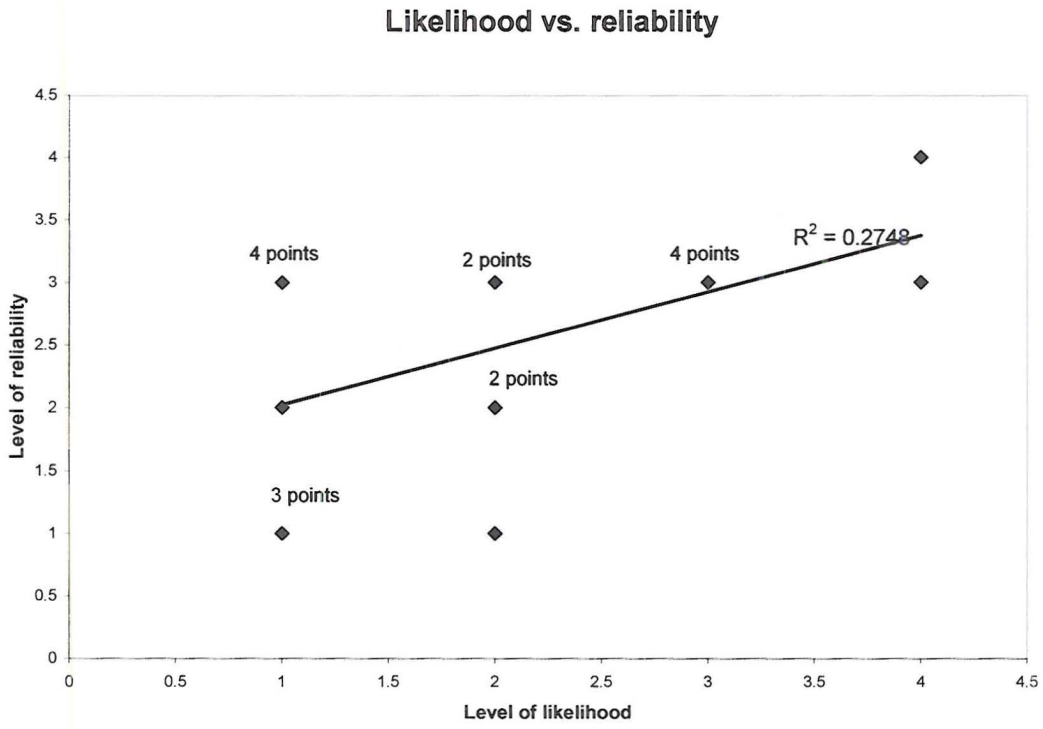


Figure 19: Correlation between indicated level of likelihood of making a request for Zetia to a doctor and indicated rating of the reliability of the Zetia ad.

Discussion

Hypothesis 1 was not supported. It was found that being familiar with prescription drug advertisements and making ad-based prescription requests to a doctor were not significantly correlated at $p < 0.05$. The correlation, however, would be significant at $p < 0.10$. Administering a larger sample size could possibly result in a significant result. Hypothesis 2 was not supported either. It was found that indicating persuasion by the ad for Zetia and measure of likelihood of requesting Zetia from a doctor after viewing the ad was an insignificant relationship. The chi square value obtained was 3.006, which resulted in a p value much too low to be even close to significance.

The Datti and Carter study findings discovered that odds of receiving recommendations for treatment (including alternative medical services such as diagnostic testing rather than a requested drug) increase with age (Datti and Carter, 2006). This may reflect a reluctance to request medication from a doctor or fewer ads targeted at the elderly adult audience. The majority of survey respondents in the present survey indicated familiarity with the advertising, but surprisingly few number of survey respondents had even made an ad-based request at all. This also suggests reluctance to make ad-based prescription requests. The Datti and Carter study also suggested that older adults are less likely to request a medication after being exposed to a drug advertisement (Datti and Carter, 2006). This was also seen in the present study with most survey participants indicating that they were very unlikely to request Zetia from their doctor after viewing the advertisement.

A study done by Sumpradit and colleagues revealed that consumers who were afflicted with chronic conditions had more positive views of direct to consumer advertising and were more willing to talk with their doctors about advertised drugs (Sumpradit, Fors, and McCormick, 2002). Elderly people are more likely to be suffering from chronic conditions than most people, yet the respondents of the present survey had mixed feelings regarding direct to consumer advertisements for prescription drugs. A study found that individuals that older persons were most aware of ads for osteoporosis and hypercholesterolemia (Bell, Kravitz and Wilkes, 1999). Nearly half of the elderly participants in the present survey were unaware of ads similar to the one presented for Zetia which is contradictive of Bell, Kravitz and Wilkes. Those who were more likely to report that their relationship with their doctor had declined were those participants who had not had their request for a prescription granted (Murray et al, 2004). This is interesting because the present study found correlation between those who were denied their request and bad credibility ratings for the doctor in the Zetia ad ($p < 0.10$). Perhaps once a request is denied, all doctors do not appeal to individuals.

Another study done by Shah and colleagues had shown that doctors who use partnership type denials where the doctor cooperates with the patient in their treatment elicit more positive responses rather than doctors who paternalistically deny an ad based request (Shah, Bentley and McCaffrey, 2003). Those that had been previously been denied a request could have been more paternalistically denied their request and therefore tend to have a negative outlook at the doctor in the Zetia ad. Individuals who were taking prescriptions at the time the study completed by Bell was done were more likely to anticipate an argument when responding to a denial of an ad based medication request

(Bell, Wilkes and Kravitz, 1999). There was no correlation found in the present survey between request denial and those that take prescriptions.

A minimal number of respondents to a 2004 study said that they read all info in ads for prescriptions, only spending an average of 2 seconds deciding if they were interested or not. Pictures were viewed the most and the text the least, even though risk information is presented in text form (Sumpradit, Ascione, and Bagozzi, 2004). This suggests that the participants in the present study had not fully read the risk information and had jumped to their own conclusion based on either their past experiences or by the picture on the ad. A study completed by Weissman and colleagues found that more than half of visits where a certain medication was requested based from an advertisement did not result in that drug is being prescribed. Common reasons for this are cost and the availability of other less expensive equally effective drugs on the market (Weissman et al, 2004).

Yet another study's findings suggest that most consumer advertisements for prescription drugs target common symptoms, leading to the potential danger of turning ordinary experiences into diagnoses (Woloshin et al, 2001). Few ads present data to support drug benefits. Most just give the impression that the drug will be of benefit. Very few participants in the present study, however, responded that they had made an ad based request. A study done involving college students revealed that they were more familiar with ads that were of use to them such as ads for painkillers. Not many had reported buying or requesting a medication in response to an ad, but there was a significant relationship between the number of medications they were taking and the number of ads they had seen (Byrak, 1999).

There were several limitations to the present survey. Surveys were only administered in the Gardner Senior Center. Elderly attendees at the senior center are not fully representative of other elderly people because individuals at the senior center are at least mobile enough to leave their homes. They are more likely to be aware of their surroundings and therefore more aware of the presence of the advertisements. The sample size was very small, though the majority of the people at the center present at the time of administration did complete the survey. The survey was given at one time and one time only. A more proper analysis would have involved a second or third administration of the survey at different times of the day. Also some participants seemed to be slightly apprehensive about completing the survey. They were skeptical about signing the consent form, afraid that they were going to be contacted later or have their privacy invaded.

As far as additional research goes, more samples could be taken, giving a more comprehensive study. Different participants could have been chosen, say between those in the senior center and those in a nursing home. That would distinguish the differences between mobile senior citizens and those limited to their homes. Another interesting study could involve students from WPI and elderly individuals to compare the results between the generations. Young people tend to be more involved in viewing media and have more of a sense of the current than the elderly. Doing such a study would reveal if there really is a difference. Also a study could be done comparing Zetia with a commonly used statin medication like Lipitor by surveying people who are currently taking those medications.

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