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Misinformation in Consumer Product Reviews and their Effect on Resonance Marketing

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Abstract
The purpose of this study is to test the theory of resonance marketing in an experimental setting. We want to see the effects product reviews can have on consumers, specifically how reviews can affect a consumer's perception of a product's quality. We will use beer, a well--known resonance marketing product, and conduct taste tests under varying conditions where the treatments involve reviews and the control does not. We will use subjects that are the target of resonance marketing, namely consumers with defined preferences and a willingness to pay for high quality products.

Keywords
resonance marketing, beer, consumer, operations and information management

Disciplines
Business

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Misinformation in Consumer Product Reviews and their Effect on Resonance Marketing

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Abstract

The purpose of this study is to test the theory of resonance marketing in an experimental setting. We want to see the effects product reviews can have on consumers, specifically how reviews can affect a consumer's perception of a product's quality. We will use beer, a well-known resonance marketing product, and conduct taste tests under varying conditions where the treatments involve reviews and the control does not. We will use subjects that are the target of resonance marketing, namely consumers with defined preferences and a willingness to pay for high quality products.

I. Introduction

In designing this experiment the focus of this study is to test the theory of resonance marketing in an experimental setting. Resonance marketing holds that consumer informedness and the consumer's ability to differentiate between product offerings are key drivers in the success of highly differentiated products selling at high profit margins. Some examples of resonance products include the energy drink industry, high quality ice cream such as Ben and Jerry's, or the golf club industry to name a few (Clemons, Gu and Spitler 2003). All of these products often come in many different varieties, with each variety catering to a specific segment of the market. For example, 10th Tee Gold Energy Bar is targeted at golfers on the last 9 holes of their golf game. Further, these products sell at a high margin relative to more average or standard products. Our experiment will specifically focus on whether product reviews – a very important information source in consumer purchasing behavior – influence a consumers' ability to accurately differentiate between two similar products that vary only in quality.

Resonance marketing is based on two assumptions:

1. Consumers' initial purchase decisions are influenced and informed by publicly available reviews
2. Consumers can readily detect the quality of the product once they consume it.

There are several implications that follow from these two assumptions. First, if a consumer's initial purchase decision was based on inaccurate reviews, the consumer will immediately notice the discrepancy between the product and the review, and therefore, will not purchase the product again. Second, bad products will likely get bad reviews and perish; while good products are expected to get good reviews and thrive. Lastly, companies will see no benefit in trying to manipulate

reviews and sell bad products, because these products will be quickly discovered as not meeting consumer preferences and perish (Clemons, Gao and Hitt 2006).

We will use the craft brewing industry to test the assumptions of resonance marketing. In the past 10 years, the craft brewing industry has seen an explosion of new craft breweries creating highly differentiated products. These beers target very specific segments of the market. Walking into any beer store the variety is vast and prices have increased accordingly. As the craft brewery scene has flourished, online reviews of the myriad beers have grown at a commensurate pace, especially on websites like Ratbeer.com and Beeradvocate.com. The high degree of differentiation amongst products in the same category (i.e. beer) and a strong online review community are necessary and sufficient conditions for exploring the research questions below.

- We will test whether consumers can tell the difference between two beers of the same style that differ in quality.
- We will test whether consumers are able to recognize a discrepancy between a review of a beer and the quality of the same beer. For example, whether a lower quality beer with a good review can masquerade as a higher quality beer.
- We will test the degree to which manipulated reviews can affect a customer's preferences for a highly differentiated product: beer.

Finding answers to these questions through this experiment will be vital in determining the long-term viability of resonance marketing.

II. Background

Resonance marketing has been a prominent strategy since the advent of the Internet. Companies use a resonance marketing strategy to offer consumers hyper-differentiated goods that are tailored to meet consumer's needs, and because of the

fit between consumer preferences and the product, consumers are willing to pay more. A key to the success of resonance marketing is increased consumer "informedness," whereby consumers can discover and know the exact attributes, availability and quality of products before they make a purchase. There have been several studies that have investigated the phenomenon of consumer informedness via the internet and further developed ideas around the long-term success of resonance marketing (Clemons, Gao, and Hitt 2006; Clemons, Gu and Spitler 2003).

An increasingly important part of consumer informedness is the use of online reviews to assess product quality. It has been shown that reviews directly influence consumers' product choices. It has been found that consumers who read product reviews were twice as likely to purchase a product as consumers who did not read (Senecal and Nantel 2004). Reviews have also shown to be an effective predictor of a company's (in this case movies) sales and marketing strategy and the extent to which consumers will enjoy the products they purchase (Dellarocas 2003). Beyond the fact that reviews can predict sales, there has been evidence that shows that positive reviews are indicative of increased sales, but that a negative review is more powerful in decreasing sales than a positive one (Chevalier and Mayzlin 2003). These studies have laid important groundwork for the study of the interaction of online reviews on consumer choice and preferences. In sum, reviews are important to companies, because they can influence purchasing decisions and predict sales. Moreover, online reviews do not symmetrically influence consumer decisions: bad reviews tend to be more powerful than positive reviews.

Another stream of literature has cast doubt on the usefulness of reviews for consumer decision-making as many companies filter reviews. In particular, one study shows that whether or not firms filter out what they consider to be non-relevant reviews affects how consumers use the reviews. For example, when firms did not filter these non-relevant reviews the way consumers read the reviews shifts – namely that consumers rely more heavily on extreme reviews (Awad and Etzion 2006). Further, it has been shown that competitors and friends write many reviews

biasing the ratings (Harmon 2004). The music industry has also been shown to hire professional marketers to write positive reviews for newly released albums (Mayzlin 2006; White 1999). In fact, we have seen that in almost all cases it is expected for firms to manipulate their reviews, however consumers expect this and in turn discount the value of reviews (Dellarocas 2006).

We have also looked further into how consumers judge the quality of products based on different factors. In one experiment involving taste testing of wine, researchers looked at consumer decision-making involving varying degrees of wine expertise. They asked novices and experts to taste test wines with varying degrees of information including wine quality, brand and country of origin. It was found that both groups were affected, but in different ways, and that experts, for example, heavily weighted quality on the wine's country of origin as opposed to quality alone (D'Alessandro and Pecotich 2013). This presents an interesting fact in that consumers with increased knowledge of a product can still be affected by various outside cues, such as brand, price and country of origin. In another study, bar patrons were asked to rate beers under two conditions: regular beer and beer with some vinegar. Further, the participants either performed the experiment blind or were informed either before or after that there was vinegar in their beer. An important conclusion was that in fact the revelation of information has an important effect on the preferences of consumers, especially the timing of the revelation (Lee, Frederick, Ariely 2006).

It can be seen that resonance marketing will likely be an important strategy for the future of many firms. Our study builds on the previous research into consumer decision-making under varying influences, the effect of online reviews on consumer choice, and resonance marketing. We are framing our research in the context of resonance marketing, and seeking to understand if it is a viable long-term strategy by studying consumer behavior and consumers' ability to differentiate between the quality of products. This is important because resonance depends on consumer informedness and reviews will play an important role in consumers' information

sources. Thus we see this study as a valuable opportunity to further understand how consumers could be affected by manipulated reviews and the direct implications on resonance marketing.

III. Experimental Methodology

Experimental Design

The main design element of this experiment is taste testing (further described in the Procedures Section). We will be using beer taste tests to help us determine if consumers' preferences can be influenced by reviews. Each participant will do a taste test of six beers, in three sets. Each set will contain one high quality and one low quality beer of the same style. The participant will be asked to try each and then indicate which one they believe is better. This test will also happen under two different conditions: treatment 1 (control) and treatment 2, where the participants will be asked to read reviews before trying the beers. To record this data we will use an analysis of each subject's baseline preferences and beer knowledge ("Beer Expertise Test") and also record their preferences after each taste test.

This experiment will involve using a control (treatment 1) and an experimental group (treatment 2).

The bartender will also be blind to the experiment hypotheses. We will also ensure that the participants are not aware of the study hypotheses or purposes.

Target population

Our target population is experienced beer drinkers of legal drinking age (over 21 years old). The amount of experience will be determined by our Beer Expertise Test. Since we are hosting the experiment in Victory, the target population will be determined by people who attend Victory on the dates of the experiment and who elect to participate.

We will seek out participants who show an above average knowledge of beers. This will be assessed using the "Beer Expertise" questionnaire in the bar, whereby subjects will be asked a range of questions that provides a proxy for someone who has the necessary beer knowledge for the experiment. Through the assessment subjects will have to identify what beer classifications and beers they are familiar with, how often they drink a specific list of beers, if they can identify the beers in the list into specific categories, how many beers they drink in an average week, and describe their purchasing habits.

We are looking for someone who drinks about 4-10 microbrews a week and is therefore knowledgeable or has expressed preferences for beer because resonance marketing targets and hinges upon consumers who have defined preferences and who can adequately distinguish between products with different attributes.

Study duration

We expect the whole study, including subject enrollment and study completion, to take no more than 2 weeks and 5 visits to Victory Brewery. We will recruit the subjects directly from the pub and believe we can complete 3-5 taste tests in one hour. The whole experiment should not take more than 20 minutes per person.

Subject recruitment

The main participants in this research will be drawn from people who are of drinking age. The experiment will be conducted with our partner, Victory Brewery, where we will find subjects who will fit the criteria we desire.

We will attempt to isolate participants during the experiment. There will be a small but visible sign that invites people to take part in the experiment (Appendix A). Flyers will also be distributed on the tables to attract an adequate number of participants. Additionally, when a participant enters the bar an experiment investigator will attempt to greet them and offer them the opportunity to participate in the study.

Study Instruments

This study will use pairwise testing to help determine the influence of reviews on subjects' perception of beers. There are also two study instruments included in the study proposed here. The first study instrument is a questionnaire that we call the "Beer Expertise Test" (Appendix B), and the second study instrument is a survey of the participants' experience after each beer taste test trial (Appendix C). Both instruments will be administered on paper. The "Beer Expertise Test" is designed to identify participants' beer preferences and purchasing habits. It will allow the investigators to collect some minor demographic data, such as age and gender.

The taste test survey will be administered during each round of taste testing and is designed to assess the participants experience with the beer. The survey will be distributed in paper form. It will be used in both treatment 1 and 2 (further discussed in the Procedures section) and every group will get the same instruments.

Method for Assigning Subjects to Groups

There will be two treatments: 1 and 2. Treatment 1, the control, will contain only one group. Treatment 2 will contain three groups. The three groups in treatment 2 are dependent on which reviews are cross-matched (discussed in detail in the procedures section). The first 20 people will be assigned to treatment 1, the next 20 people will be assigned to group 1 of treatment 2, the next 20 people will be assigned to group 2 of treatment 2 and the last 20 people will be assigned to group 3 of treatment 2. The number of people involved in each experiment is based on several previous experiments from the literature cited in our research.

Administration of Surveys and/or Process

Throughout the experiment we will NOT use any personally identifiable data. The only time subjects will give this data is on the consent form and that will never be associated with their experiment or the data we collect. Subjects will never be asked for personal information.

We will not review any records or registries with identifiable private information. This is important especially for experiments involving human subjects.

The "Beer Expertise Test" will be administered once, right after the subjects sign the consent form (Appendix D). The "Expertise Test" should take no longer than 10 minutes. Specifically, we will use the Beer Expertise Test to filter people for the experiment because we are looking for a specific demographic. We will score the Expertise Test quickly and then notify subjects if they are qualified to proceed. This will help us narrow down the group of individuals that best fit the criteria for the study (detailed in the choosing subjects section).

The taste test survey will be taken after the subject tries each of the 3 sets of two beers. The subject will need to rate the two beers and determine which beer they believe is of higher quality as well as answer some questions about the quality of the beers. Marking their preference should take no more than 1 minute, or 3 minutes total for all the surveys.

A bartender who is certified to deliver alcohol to patrons will be bringing out three sets of beers. He will also be bringing out the taste test survey, in paper form, and a writing utensil, to be completed after each set of beers. The taste test survey will be marked with a specific code so we can organize the taste surveys at the end. The bartender is blind to the hypothesis of the experiment and will be given a simple script in order to explain the beers and the survey. Or, an investigator will be there to explain the process and survey.

The participants are able to withdraw from the study at any point.

Procedures

This experiment will take place at the bar of Victory Brewery, a partner in this study. Victory has given their consent and has agreed to participate and offer various services, including hosting, serving alcohol, checking IDs and other tasks

associated with the experiment, as detailed below. The experiment will be conducted in one private part of the bar.

If a participant verbally agrees to participate, the bartender who is involved in the experiment will check their legal identification to ensure that they are over the legal drinking age (21). The bartender will also be in charge of serving, pouring and handling the alcohol throughout the experiment. After the participant's age is verified, the participant will be given a paper consent form that explains the purpose of the study and will inform the participant that the study is entirely voluntary and that they may exit at any point in the study without penalty.

After signing the consent form, the investigators will present the participants with a "Beer Expertise" Questionnaire. The questions explore a participant's beer preferences and purchasing habits. We will perform interim data analysis; our study requires a population that has a requisite level of experience with beer. The beer questionnaire will help us to determine who qualifies for the experiment. Prospective participants who do not qualify will be notified and thanked for their time. Participants who meet the criteria will be included in the experiment. There will be no personally identifiable data collected in the Beer Expertise Survey.

We will administer the questionnaire in paper form. We expect the questionnaire to take about 10 minutes. The participants will be required to answer all questions to the best of their ability as all the questions are designed to assess beer preferences and expertise. They will have the option to not answer all the questions, but if so they will not be able to complete the rest of the experiment.

Throughout the experiment we do not want to harm any beer brand or brewer's reputation so we will hide the names and brands of each beer. We also do not want to associate with a specific brand or influence any subjects. Further subjects, will be isolated so as not to have any outside influence. Although we are deceiving the subject's because we are not telling them what beer's they are drinking this is an

important consideration within our experiment. Beyond protecting the beer brands it is important that the subjects not know what they are drinking because if they knew it would likely influence their assessment.

The experiment will consist of asking participants to try different pairs of the same style of beer. The three styles are Pilsner, Hefeweizen, and Stout. These are three clearly defined and distinct styles of beer that are well known among many beer drinkers. Each pair will consist of a higher quality beer and a lower quality beer, as determined by beer rating sites (Beeradvocate.com and Ratebeer.com), asking beer professionals and other qualified people who can assess beer quality such as employees at craft brew stores. Overall there will be a total of six different beers, two for each style. We will serve the beers in the specific order: Hefeweizen, Pilsner, Stout. Subjects will be assigned their treatment and specifics such as which beers receive the correct or cross-matched reviews in the randomization process (Appendix E). The only information subjects will know will be the style of the beer they are tasting.

Some participants will be assigned to the control (treatment 1) and the other participants will be assigned to the second condition, where the beers are delivered with a review (treatment 2). The control will consist of trying the six beers without reviews, while treatment 2 will consist of trying the six beers with reviews. Each of the three styles has a low quality and a high quality beer. This difference in quality was defined by looking online at two reputable beer rating sites: Beeradvocate.com and Ratebeer.com. These were also verified by asking several beer enthusiasts.

The three styles of beers, the specific beer names (brewery), and the relative [quality] will be:

1. Hefeweizen
    a. Mad Kings Weiss (Victory Brewing Company) [Hi]
    b. Shock Top (Anheuser-Busch InBev) [Low]
2. Pilsner

   a. Braumeister Pils (Victory Brewing Company) [Hi]
   b. St. Pauli Girl (St. Pauli Brauerei) [Low]
3. Stout
   a. Dark Intrigue (Victory Brewing Company) [Hi]
   b. Storm King Stout (Victory Brewing Company) [Low]

I. Control – Treatment 1

Treatment 1 will serve as the control. As stated above, participants will be put in this group by random assignment. In this treatment each subject will try each of the six beers, in the specific order mentioned above, and with specified intervals. Each subject will be served 1.5-2 ounces of each type of beer. The participants are given a survey with each flight; after trying two beers of each style, the participant be asked to fill out a paper survey, and rate which beer they believed was of higher quality as well as few other questions about their experience with the beer.

During this experiment Participants will get a cup marked with one of the letters from "A" to "F," each of which corresponds to one of the six beers. Participants will not know which beer they are trying, but they will know the style. These letters will allow the investigator to track which beers the participant is consuming and will allow the participant to properly note their opinion on the survey. Between trying each cup the subject will cleanse their pallet with a small glass of water, and there will be unsalted crackers available as well. This part of the experiment will allow us to better understand if participants can accurately and distinguish between different qualities of beers.

II. Treatment 2

Treatment 2 will help us answer our research questions and serve as a way

to test if reviews can affect a subject's perceptions of two beers of the same style but of differing qualities and how reviews can change people's preferences. One important aspect of this part of the experiment will involve having the participants read reviews before trying each beer. Before trying each beer a participant will be asked to read a page with the reviews on them. The review the subject will be receiving depends on the order of treatment they are getting. Each review will be on a separate sheet of paper. We will only have one cross-matched style per subject. This is done to help prevent participants from figuring out the experiment by realizing they are consistently getting cross-matched reviews. Specifically, of the three styles of beers each participant will get, two styles (four beers) will have the correct reviews and one style (two beers) will have cross-matched reviews. When reviews are cross-matched it means that reviews for two beers of the same style are switched. For example, one review was written for the Mad King Weiss and one was written for the Shock Top, but if these beers are cross-matched the Mad King Weiss would be paired with the Shock Top review and vice versa. Correctly matched indicates that each review is written for its respective beer (Shock Top review for Shock Top beer). Subjects will be assigned to one of three groups in treatment 2. Group 1 will have the Hefeweizen reviews cross-matched. Group 2 will have the Pilsner reviews cross-matched. Group 3 will have the Stout reviews crossmatched.

Reviews are a vital part of the experiment. To ensure consistent reviews with similar language and style we will synthesize the reviews ourselves. We will compile these reviews by looking at two reputable beer rating websites/review aggregators: Ratebeer.com and Beeradvocate.com. We will look for several highly rated reviewers for each style of beer, compile the best ones and edit them to represent a reliable review of the beer. The standards of a reliable review will be based off of the websites' criteria. We will also get these reviews approved and reviewed by a panel of 2 to 3 beer experts.

The experiment will be conducted the same way as treatment 1 except before trying each beer the subject will be asked to read a review. We will look for the influence of reviews on consumer preferences by conducting a cross-matched and correctly-matched taste test. Each subject will get no more than 1 cross-matched set.

IV. Experimental Design Considerations

The following are important considerations in creating an experiment using human subjects.

Consent Process

After the subject is approved as being over the legal drinking age by the bartenders, we will immediately give the participants the consent form. The consent form will be accompanied with a document that gives a brief overview of the experiment. This experiment will involve some deception. As such, we inform participants in the consent form that they will be receiving incomplete information and they will be fully debriefed (Appendix F) immediately after the research procedures are completed.

Potential Study Risks

The consumption of alcohol does pose several risks. However, we think these risks will be mitigated by the fact that subjects will only be getting very small amounts of alcohol, no more than 12 ounces total. Further, there is a qualified bartender and professional who will be serving the alcohol and monitoring all participants and who will prevent inebriated participants from being involved in the study. Further, this professional will intervene if they find a participant is reaching any level of inebriation.

Deception is necessary in this experiment, as subjects cannot know which beers they are tasting as this will likely influence their perception of the beer and the quality of the beer. Further, this deception will allow us to isolate the effect of reviews. We find the risks of deception to be minimal and we do not believe they will cause any psychological discomfort. We will also provide a debriefing that explains the experiment and that informs them that some of the reviews may not have matched the beers they tried. We will also provide information where they can ask questions after the experiment.

Potential Study Benefits

This study provides no direct benefits to participants. However, this study is expected to provide a deeper understanding of resonance marketing. This will be important to many industries whose success depends on implementing a resonance strategy. Further, this will be useful for consumers who use and trust online reviews. These results will help to inform how companies can continue to offer premium and differentiated products to consumers while also earning higher profits.

Risk / Benefit Assessment

We believe that the experiment will provide significant benefits through increased understanding of resonance marketing and the effects of manipulated reviews on consumer preferences. We may also better understand the viability of online reviews for companies that aggregate and use those reviews on a frequent basis. Since the numerator, benefits, is believed to be large, and the denominator, risk, is believed to be small, we conclude that limited risk is being taken for the possibility of large benefits and that we have an attractive benefit to risk ratio.

V. Discussion

The paper above describes the experimental design that must be approved by the Institutional Review Board (IRB) before it can officially involve human subjects. We

are currently in the process of getting IRB approval for this project and hope to start the experiment in the near future.

Although we have not formally collected any data we foresee some ways to analyze the data. Our analysis will be used to help us determine if the reviews were able to significantly influence the subjects' ability to distinguish between the beers of differing quality. Specifically, we will compare the cross-matched results to the correctly matched results and analyze if the mean ratings significantly differed from each other.

The ratings from the surveys will be inputted into an excel spreadsheet. We will then use the data analysis toolkit that comes with Excel in order to conduct paired t-tests.

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Appendix

Appendix A

The Wharton School
University of Pennsylvania

Department of Operations and Information Management

Is conducting a Research Study on:

Beer Quality Differences in the Microbrew Industry

At Victory Brewery

You may be eligible if you are:

- Of legal drinking age (21)
- Interested in doing beer taste tests

Eligible subjects will be asked to conduct a short survey on their beer preferences and may be involved in a taste test of several beers.

Principal Investigator: Professor Eric K. Clemons
For more information please approach _____.

Appendix B

Subject ID:	Official Use:

Beer Expertise Questionnaire

Thank you for participating in our experiment.

Please fill out the questionnaire below. Your participation in this experiment is voluntary and you are not required to answer any or all of the questions below. However, in order to have the opportunity to participate in the rest of the experiment, you must complete all the questions in this questionnaire.

Upon completion of this questionnaire please hand this to the investigator. After assessing this questionnaire the investigator will inform you if you are eligible to continue with this experiment

---

Pleas answer the questions below:

1. Have you ever taken a course on beer or beer tasting? Yes No

2. On average, how many beers do you drink a week? (Circle one of the 5 choices below):

   0 2-4 4-6 6-8 >8

3. Of the number of beers you drink in a week, how many are microbrews?

   0 2-4 4-6 6-8 >8

4. Please name the 4 beer brands you drink on a regular basis:
   1.

   2.

3.

4.

5. What is the average price you pay for ONE bottle of beer? $_____

6. What is the maximum price you would be *willing* to pay for ONE bottle of beer? $_____

7. When you buy beer what are the four (4) qualities you look for?
   1.
   2.
   3.
   4.

8. If had a friend who was interested in buying a bottle of beer and who knew nothing about beer, what would be the 4 things that they should look out for, in order of importance?
   1.
   2.
   3.
   4.

9. What is meant by the following beer terms?

   No more than one short sentence per word. (Please write N/A next to a term if you are unsure of its meaning)

   1. Hoppy
   2. Malty

3. Head
4. Palate/Mouthfeel
5. Lacing
6. ABV

10. Which of the following beers have you tried (Circle all that apply):

Hoegaarden	*Guinness*
Budweisder/ Bud Light	*Founder's Kentucky Breakfast Stout*
Coors/Coors Light	*Shocktop*
Heinekin	*Blue Moon Belgian White*
Dogfish Head 60 Minute IPA	*Stone Imperial Russian Stout*
Dogfish Head 90 Minute IPA	*St. Pauli's Girl*
Dogfish Head 120 Minute IPA	*Allagash White*
Lagunitas IPA	*Delirium Tremens*
Sierra Nevada Pale Ale	*Brooklyn Lager*
Victory Hop Devil	*Chimay Triple*
Victory Dark Intrigue	*Goose Island Honker's Ale*
Victory Braumesiter Pils	*Goose Island IPA*
Victory Dark Intrigue	*Goose Island Pere Jacques*
Victory Mad King Weiss	

11. Please order the following beers from highest quality to lowest quality: (Place a number under the each beer with 1 being the highest quality and 5 being the lowest quality)

Westvleteren 12 (XII)	Founder's Breakfast Stout	Bud Light	Sam Adams Lager	Hoegaarden

12. How much do you think you know about beer versus the average beer drinker? (Please circle one number)

Know Nothing		Average		Expert
1	2	3	4	5

13. How long since your last purchase of beer? _____ Days

14. Please think of the best beer you have ever tried.
What was the name of that beer? _____

Appendix C

Subject ID:

Official Use:

Taste Test Survey

Please fill out the survey below as you try the six beers.

There are three sections of this survey:
1) Hefeweizen
2) Pilsner
3) Stout

You will try two beers from each category and after each two beers you will be asked to fill out this survey that corresponds to that beer type. Please answer all the questions.

Upon completion of the taste test and questionnaire please hand this to the investigator.

For your information please note some general definitions of these terms used in reviewing beers:

- **Aromas:** Bring the beer to your nose. Note the beer's aromatic qualities. Malts: sweet, roasty, smoky, toasty, chocolaty, nutty, caramelly, biscuity? Hops: dank / resiny, herbal, perfumy, spicy, leafy, grassy, floral, piney, citrusy? Yeast will also create aromas. You might get fruity or flowery aromas (esters) from ales and very clean aromas from lagers, which will allow the malt and hop subtleties to pull through.

- **Appearance:** Note the beer's color, carbonation, head and its retention. Is it clear or cloudy? Does it look lackluster and dull or alive and inviting?
- **Flavor:** Take a sip of the beer. Note any flavors, or interpretations of flavors, that you might discover. The descriptions will be similar to what you smell. Is the beer built-well? Is there a balance between the ingredients? Was the beer brewed with a specific dominance of character in mind? How does it fit the style?
- **Palate:** Take a sip of beer and let it wander. Note how the beer feels on the palate and its body. Light, heavy, chewy, thin / watery, smooth or coarse? Was the beer flat, over-carbonated?

Your participation in this experiment is voluntary and you are not required to answer any or all of the questions below. However, in order to have the opportunity to participate in the rest of the experiment, you must complete all the questions in this questionnaire.

HEFEWEIZEN SURVEY

Please answer the following questions after you have tried the hefeweizen beers (first two beers):

1. Which beer was of higher quality (fill in the blanks with the codes that correspond to the codes on the cups)?

   Higher Quality _____

   Lower Quality _____

HIGH QUALITY BEER REVIEW

Please rate the higher quality beer:

2. Higher Quality Beer: Please give an overall score to the higher quality beer using the scale below. (Circle one number)

Terrible		Average		Excellent
1	2	3	4	5

3. Higher Quality Beer: Please fill in a number within the scale for each of the following categories:

   Aroma (1-10): _____

   Appearance (1-5): _____

   Flavor (1-10): _____

Palate (1-5): _____

Overall (1-20): _____

4. Please add any other comments you may have on the HIGHER quality beer (please limit to three sentences):

LOW QUALITY BEER REVIEW

Please rate the lower quality beer.

5. Lower quality beer: Please give an overall score to the lower quality beer using the scale below. (Circle one number)

Terrible		Average		Excellent
1	2	3	4	5

6. Lower Quality Beer: Please fill in a number within the scale for each of the following categories:

Aroma (1-10): _____

Appearance (1-5): _____

Flavor (1-10): _____

Palate (1-5): _____

Overall (1-20): _____

7. Please add any other comments you may have on the LOWER quality beer (please limit to three sentences):

PILSNER SURVEY

Please answer the following questions after you have tried the pilsner beers (third and fourth beers):

1. Which beer was of higher quality (fill in the blanks with the codes that correspond to the codes on the cups)?

   Higher Quality _____

   Lower Quality _____

HIGH QUALITY BEER REVIEW

Please rate the higher quality beer:

2. Higher Quality Beer: Please give an overall score to the higher quality beer using the scale below. (Circle one number)

Terrible		Average		Excellent
1	2	3	4	5

3. Higher Quality Beer: Please fill in a number within the scale for each of the following categories:

   Aroma (1-10): _____

   Appearance (1-5): _____

   Flavor (1-10): _____

Palate (1-5): _____

Overall (1-20): _____

4. Please add any other comments you may have on the HIGHER quality beer (please limit to three sentences):

LOW QUALITY BEER REVIEW

Please rate the lower quality beer.

5. Lower quality beer: Please give an overall score to the higher quality beer using the scale below. (Circle one number)

Terrible		Average		Excellent
1	2	3	4	5

6. Lower Quality Beer: Please fill in a number within the scale for each of the following categories:

Aroma (1-10): _____

Appearance (1-5): _____

Flavor (1-10): _____

Palate (1-5): _____

Overall (1-20): _____

7. Please add any other comments you may have on the LOWER quality beer (please limit to three sentences):

STOUT SURVEY

Please answer the following questions after you have tried the stout beers (fifth and sixth beers):

1. Which beer was of higher quality (fill in the blanks with the codes that correspond to the codes on the cups)?

   Higher Quality _____

   Lower Quality _____

HIGH QUALITY BEER REVIEW

Please rate the higher quality beer:

2. Higher Quality Beer: Please give an overall score to the higher quality beer using the scale below. (Circle one number)

Terrible		Average		Excellent
1	2	3	4	5

3. Higher Quality Beer: Please fill in a number within the scale for each of the following categories:

   Aroma (1-10): _____

   Appearance (1-5): _____

   Flavor (1-10): _____

Palate (1-5): _____

Overall (1-20): _____

4. Please add any other comments you may have on the HIGHER quality beer (please limit to three sentences):

LOW QUALITY BEER REVIEW

Please rate the lower quality beer.

5. Lower quality beer: Please give an overall score to the lower quality beer using the scale below. (Circle one number)

Terrible		Average		Excellent
1	2	3	4	5

6. Lower Quality Beer: Please fill in a number within the scale for each of the following categories:

Aroma (1-10): _____

Appearance (1-5): _____

Flavor (1-10): _____

Palate (1-5): _____

Overall (1-20): _____

7. Please add any other comments you may have on the LOWER quality beer (please limit to three sentences):

Appendix D

Beer Quality Differences in the Microbrew Industry

Informed Consent

The purpose of this experiment is to better understand how consumers differentiate between products in industries that offer unique and differentiated products. We will be using the beer industry as our model.

Today we will ask you to do a beer taste test. You will first be given a short questionnaire to fill out regarding your general beer preferences. If it is deemed that you are eligible, you will then be given six 2 oz cups filled with beer and will be asked to review the beers after each two cups.

Your participation in this study is entirely voluntary. You can withdraw from the study at any time by informing us. Please note that this study involves the consumption of alcohol and you must be over the legal drinking age of 21 years old to participate. Although you will be asked to consume very little alcohol take a few moments to note the risks from alcohol listed at the bottom of this page.

Please note that you are not getting full information about the experiment as revealing that information would affect how the study is conducted. You will receive a debriefing form after the experiment that further explains the study.

If you have any questions about your rights as a research participant, or if you think you have not been treated fairly, you may call the University of Pennsylvania Institutional Review Board (IRB) at 215-898-2614. If you have any questions for the researchers, you may contact them via email at clemons@wharton.upenn.edu.

Date _____ Signature_____ Name_____

Risks of Drinking Too Much Alcohol

There are certain risks associated with drinking too much:

- Vomiting.

- Blacking out and not remembering what you did while you were drunk.
- Passing out in an unfamiliar place or a place where your safety could be at risk.
- Decreased inhibitions resulting in embarrassing and dangerous behavior.
- A hangover which includes: nausea, fatigue, upset stomach, headache, sore muscles, "cotton mouth," lack of motivation.
- Alcohol-related injuries resulting from loss of inhibitions and coordination.
- Death by nervous system failure, injury and choking (on own vomit).

Appendix E

Beer Quality Differences in the Microbrew Industry

Debriefing Form

Thank you for participating in our study. One aim of our research is to determine whether resonance marketing, an important concept in the success of niche, high margin products, can hold up under external influences, such as manipulated reviews. Some examples of products that fall under resonance marketing include: microbrew beers, specialty power bars, and Ben and Jerry's Ice Cream – these are all products that sell at a higher price, but offer unique value to consumers versus mainstream products. Under the assumptions of resonance marketing, consumers can detect quality differences in products and thus is willing to pay more for higher quality products.

Further, an important part of consumer decision-making is online reviews. Thus, we want to see the affects reviews can have on consumers. We want to know how manipulated product reviews can affect a consumer's perception of a product's quality.

Please note that in this experiment you may have received reviews that did not match the beer you tried.

As a participant, you should be aware that as an experimenter I will not have access to any information that would enable me to identify you as an individual. Please do not discuss this experiment with anyone else, some of whom may be involved in this experiment later. For any further questions or information, please contact me at clemons@wharton.upenn.edu.

We thank you for your participation.

Appendix F

Method: I went to beeradvocate.com and ratebeer.com for every beer. I found the top reviewers and choose 3 reviews from each website that I felt were consistent and representative of the beers. Of the six reviews for each beer I choose three reviews that I found the best. I then edited those to take out extra details such as source of the beer (tap or bottle), location, and any details that gave the name of the beer. For our own reference I marked each review at the beginning of the paragraph in the format [Source – Reviewer Name].

BEER REVIEW COPY

Storm King

1. [BA - WesWes] The beer pours a thick black color with a brown head. The aroma is of roasted and black malts. It also has a great hop aroma that really sets it apart from other stouts. The hop aroma is quite floral; exceptional! It also is quite malty and high in alcohol by volume. There is a good mix of dark malts and hop characteristics. The mouthfeel is good. A full bodied beer with low/medium carbonation. It is a great drinking stout; a true masterpiece. This could be the best stout I've ever had.

2. [BA – Todd] Poured an ominous pitch black beer, crowned with a mocha foam head; mixed, patchy and sticking. Retention, excellent. Thick and syrupy to the eye.

   Quite subdued in the aroma. Notes of citric hops, big earthy nose, some mustiness and a softened roasted grain. Nothing special going on here, and certainly not when compared to the rest of the beer's characteristics.

   The mouthfeel hits me upfront. It's thick, viscid, juicy and silky smooth. Malt character is complex with roasted, molasses, coffee, dark chocolate, bitty chicory, tree bark and earth. Sharp-ish hop character breaks through and melds with a roasted astringency. Flashes of citrus rind and a tight carbonation prick at the palate, balancing out the heavy dark malt characters.

   There's an interesting fruity sweetness that pulls thru, that of cherries in syrup covered in dark chocolate and an edge of pineapple in the background ... adding even more layers to twist your mind with. Alcohol is warming and complements the citric hop characters with a decent dose of blended spice. Finish is try with roasted notes and grain.

   Hell yeah! This is an outstanding stout ... flavourful, powerful and very drinkable for it's high ABV. I'll just leave it at that and recommend that all stout lovers give this beer a try.

3. [RB – yngwie] It's a black beer with just a little dark brown glow where the glass is at it's narrowest. The head is light tan, leaving nice lacings. The nose has it all, roasted malts, coffee, some chocolate and licorice notes, vanilla, citrusy and resiny hops, beef-stocky sweetness and a hint of alcohol. The alcohol is more pronounced in the mouth, giving a nice warmth as it slides down the throat. The hops are also pushed forward in the flavor, giving a nice bitterness to compete with the bitterness from the roasted malts. Quite oily on the palate, full-bodied and dry. Was expecting a sweeter one considering the aroma, but luckily it wasn't. The finish is really lasting, with good bitterness and good warmth. The coffee flavor also shows up again. Overall, this is a gorgeous beer that I would love to have access to all the time.

Braumeister Pils

1. [BA – Wvbeergeek] This is my favorite beer, pours a pale slight chill haze with a brilliant golden body and a white head, fine lacing in speckled patterns left behind. Aroma has herbal earthy mild citrus lemon peel notes all from fresh green whole leaf hops, this pale biscuit malt profile and the assertive hops will make you appreciate real beer. Flavor is bitingly bitter for a beer this light in color with fresh hops excellent on draft, biscuit malts and crackers sweetness with a kiss of herbal, lemon, grassy hop notes. Mouthfeel is light to medium bodied with slick hop oils standing out with sturdy flowing carbonation that carries this beer across my palate so well. Overall world class pils.

2. [RB – JoeMcPhee] Hazy pale blonde colour with a creamy white head. Aroma is very fresh and bright. Loaded with fresh zesty lemony saaz hops. Bright floral aromatics, fresh crisp pilsner malt and a kiss of sulfury crispness. Light bodied with a crisp bitterness and lingering floral/zesty hoppy aromatics. This beer is made for summer.

3. [RB - Thorpe429] Pours a nice, crisp light golden color with a white head and a bunch of clingy lace on the way down. The nose brings forward a bit of grain underneath a pretty good amount of floral Noble hops. The taste is slightly bitter with some floral and herbal notes, but mostly a bit of grain. The feel is better, with great carbonation carrying the flavors with a nice crispness.

St. Pauli Girl

1. [BA – NeroFiddled] An absolutely crystal clear straw-gold body is capped by a creamy bright-white head of foam. The head retention is fairly good. The nose is limited, but displays a light touch of herbal/spicy hops amidst sweet malt. The body is light/medium and it's mildly crisp and then lightly creamy

and smooth across the palate. The flavor displays a low level hop flavor and underlying bitterness that's tightly woven within a softly sweet malt. It's so well intertwined, in fact, that the beer seems almost one-sided. Of course, that does lend somewhat to a "give me more" drinkability. It finishes dry with a subtle lingering note of sweet malt that's eventually backed up by a low bitterness. As much as it's not a great beer from Germany, it's still a pretty decent European-style lager. It's clean and exceptionally well balanced.

2. [BA - biboergosum] This beer pours a clear pale straw color, with a few fingers of thin puffy white head, which leaves some swaths of lace around the glass. It smells of cracker grain, and skunky grassy hops. The taste is sweet bready grain, and grassy, weedy hops. The carbonation is a bit on the high side, the body medium weight, smooth, and it finishes off-dry, the sweet grain still prevalent, but with some more skunkiness reprising.

   At the outset, another skunky Euro-lager, but that particular beast's usual aspects are suppressed in the middle, long enough to make this drinkable.

3. [BA – Gueuzedude] Brilliantly clear, straw gold color, topped by a thin, pale white head. Sweet malt aromatics, lightly spicy hop aromatics. Actually smells a bit of sweet corn, despite the fact that I think it is all malt.

   Quite dry tasting, thought there is a touch of sweet malt here as well. This beer is quite balanced towards the bitter side of the spectrum; with quite a nice hop bite in the finish. There is a soft, dry, almost dusty grain character to it. Quite light on the palate, though it does have some presence. Certainly there is nothing objectionable about this beer; clean, with not objectionable flavors at all. Perhaps not my cup of tea, but when handed this beer, which I was, I will certainly drink it.

Mad King Weiss

1. [BA – RblWthACoz] Pours a clouded gold with a creme head. Looks like a hefe. Smells like a hefe. Flavor is good. Smooth and with a good balance of things going on. Just a nice mix of dough, spices, and banana. Feel is smooth. Good balance of carbonation and liquid. Very nicely done. A great drinker.

2. [RB - Leighton] I've drank many hefeweizens and this offering measures up to authentic German varieties. Pours a cloudy orange with soft, white head. Aroma of yeast and coriander. Flavor is yeasty with some orange citrus notes. Very smooth and well-bodied for a hefe. Loved it.

3. [RB - 3fourths] Great looking wheat beer, glowing soft yellow cream colored body with a firm, foamy white head. Mostly sweet, a bit spicy in the nose,

solid solid aroma, very fresh and vibrant wheat and banana spices... extremely tasty yeast and wheat flavors, almost a saison spicy yeast quality at times... Crisp and refreshing, finishing with estery bananas and creamed wheat

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Shock Top

1. **[**BA- Phyl21ca] Poured a slightly orangey color ale with a nice head with OK retention and some light lacing. Aroma of coriander and orange peel is more pronounced then I had expected and quite nice. Taste is a refreshing mix with orange peel notes with light wheat malt base. Body is light for style with good carbonation. Better then expected though malt base is too thin and watery.

2. [BA - UCLABrewN84] Pours a hazy very pale yellow-orange color with a white head that fades to a fizzy film on the top of the beer. Smell is of wheat, spices (coriander), and a surprisingly nice orange scent. Taste is of wheat up front, spices coming through in the middle, and the orange/citrus flavors coming in on the finish. This beer has a nice level of carbonation making for a crisp and clean mouthfeel. Overall, this is a pretty average witbier.

3. [RB - oh6gdx] Hazy yellow colour with a small foamy head. Aroma is lemon, some wheat, mild spices and some earth and yeast as well. Flavour is wheat, quite citrusy along with a slight spicyness and yeastyness to it. Not all that bad.