ERASMUS UNIVERSITY ROTTERDAM

Erasmus School of Economics

Bachelor Thesis

International Bachelor Economics & Business Economics

Discrete Choice Experiment of the Impact of Product Attributes and Health Consciousness on Chips Choices: A Study of Indonesian Consumers

Name: Wulandari Dining Astuti
Student number: 481202
Email: wulandariastuti26@gmail.com

Supervisor: Gerhard Havranek
Second Accessor: Bas Donkers

Study: IBEB / Marketing
Thesis: Bachelor
Date Final Version: 2 July 2018

Abstract

The purpose of this study is to reveal Indonesian consumers' preference toward chips product, while also taking health consciousness into account. The author solves this issue by using Discrete Choice Experiment to measure consumers' utility through product attributes. From given utility, it serves as consumers' preference toward a product. 100 respondents were asked to fill in an online survey, consisting of demographic questions and 10 choice sets. Five main product's attributes were observed in this research study: price, type of the main ingredient, level of MSG usage, level of salt usage, and packaging material. The finding indicates that four product's attributes have a significant effect in determining consumers' preference toward chips products, while another attribute has no significant effect (packaging material). Several variables were also added to the model (health consciousness, gender, and age) but none of them have a significant effect. Furthermore, this study also reveals the best product combination which can potentially give great insights for managers. The input for further research are to eliminate time constraints, try to get more representative sample, distribute the online survey in more formal manner, and expand the geographical scope which the online survey is distributed.

Table of Contents

Chapter 1
Introduction

1.1 Background

Health issue has been a gigantic problem among the society, especially in Indonesia. A number of people with chronic diseases keep increases throughout the year, as Indonesia ranks toward the higher end in regards to its overweight and obesity prevalence amidst Southeast Asian nations. Around 27% of the population is overweight and 7% is obese (tforg.com).

One of Indonesian bad habit is eating unhealthy foods and unhealthy snacks. As more and more unhealthy snacks companies enter the food industry in Indonesia, consumer' health condition is in threat. Potato chips are one of the most consumed snacks in Indonesia, shown by a revenue in the Potato Chips segment amounts to $41m in 2018, and the market is expected to grow annually by 7.5% (Statista.com). Based on personal observation, most chips which are produced by companies in Indonesia contain high MSG and use potato as their main ingredients which are believed to have high fats and calories. This could lead to an increase in health issue since researchers concluded that exposure to MSG in large quantities could lead to brain lesions, blindness, and stunned skeletal development (Olney, 1969; Bakke et al., 1978).

As a result, healthier snacks are highly needed in order to minimize the threat of consumer's health condition. Based on research, the overall conclusion is that vegetables provide many health benefits (Keck and Finley, 2004; Spence, 2003; USDA, 2001a). There is also strong evidence that vegetables could reduce the risk of any kind of cancer (Keck and Finley, 2004), as well as diabetes and arthritis (Kaur and Kapoor, 2001). Moreover, an investigation of the likely effect

of reducing the sodium content of foods on consumers' dietary behaviour, to avoid any unwanted consequences (Brady, 2002). Hence, the idea of producing healthy chips are expected to be beneficial for the consumers, and it is also believed to become a substitute for unhealthy snacks in Indonesia. Finally, a research study is needed to be conducted in order to see consumers' preference toward chips products, as well as to know whether there is any consumer interest in the market toward healthy chips. Discrete Choice Experiment is used to reveal what attributes are important in the eye of consumers and the result will provide insights to managers for business purposes.

1.2 Scientific and Social Relevance

This research study is scientifically relevant such that it provides a broader understanding of how relative importance of various attributes influencing consumer decision making. The second scientific relevance of this research study is to see what attributes are important in the eye of consumers when they buy chips product. Currently, there is lack of research regarding healthy chips, hence this bachelor thesis aims to provide ideas to a certain groups of people to see consumers' preference toward healthy chips in the market. In addition, since chips are categorized as low-involvement products, it gives challenges for chips companies in allowing their product to become stand out from the competitors. For that reason, this research study is highly needed to be conducted.

Furthermore, this research study is also socially relevant. By knowing the important product's attributes, it will provide various benefits for companies. Such information will help the company to focus on its resources on the important attributes based on consumers' preference. In addition, managers can focus on improving the performance of important attributes and consequently will lead to more effective and efficient business production. Specifically talking about vegetable consumption, the result will provide information for food marketers to

help them to be more effectively promote increased consumption of vegetables (Darian and Tucci, 2013).

For consumers, this research study is projected to deliver information regarding the importance and benefits of eating healthy snacks and maintaining a good health condition, based on food consumption. Additionally, consumers are expected to be more aware of the contents of snack which consumers consume most of the time. Given such information, they can make more suitable decision when buying chips product.

1.3 Problem Statement and Research Question

In order to determine whether it would be a great decision to launch healthy chips in the Indonesian market, it is necessary to gauge interest among Indonesian consumers. In other words, it is essential to consider characteristics of consumers in the market.

With given consideration, this research study has main research question as follows:

What is the importance of product attributes and health consciousness on consumer's preference of chips product?

Given main research question, partial questions are constructed to guide this report as follows:

1. How conscious are Indonesian consumer of their health?
2. Is there any awareness among Indonesian consumer regarding the ingredients of snacks that they consumed?
3. How do age and gender contribute in revealing consumer's preference toward chips product?

1.4 Research Objective

The objective of this research study is to focus on consumers' preference in chips product. Preference will be captured by revealing the approximate utility originated from product attributes. In addition, this research study is conducted to see whether there is any correlation between consumers' lifestyle (health consciousness) with respondents' chosen attributes. The survey consists of demographic questions, Likert scale, and choice sets or alternatives which each respondent has to fill in. From given alternatives, respondents are forced to make a trade-off between attributes. Eventually, consumers' preference can be revealed based on the utility theory, in which consumers choose a product that they find most attractive and provide them with the highest utility (Lancaster, 1966).

1.5 Research Structure

This paper consists of five chapters, and each chapter will be discussed in a detailed manner. Chapter 1 discusses background information and the reason why this research study is being conducted, the contribution of this research study in three different levels: academics, corporation, and consumers, as well as describing the research process and methodology that are used. Chapter 2 mentions about basic academic materials that have been learned throughout bachelor years which are related to this research study. Chapter 3 discusses methods that are used to gather and analyse the data. This research study adopts Discrete Choice Experiment in order to reveal consumers' preference toward chips product and use a software called JMP and SPSS to gather and analyze the data. Moreover, Chapter 4 discusses and analyze the result of collected data in several different perspectives. Lastly, this research study ended with Chapter 5 by concluding the findings and answering the main research question.

1.6 Research Process and Methodology

1.6.1 Selecting Product Category

Healthy eating habit in Indonesia is limited to the consumption of water, vegetables, and fruits and the ratio is still far from the standard by Food and Agriculture Organization (FAO). Ideally, vegetables consumption is 65.75kg/person/year. However, Indonesian only consume about 40kg/person/year (publikasiilmiah.ums.ac.id). This situation highlighted a common problem in Indonesia, which indicates that there is still lack of awareness among Indonesian in having a healthy eating habit. Based on personal observation, most Indonesian eat potato chips in their leisure time. These potato chips contain high MSG and salt, and these ingredients are approved to have a negative impact on consumers' health condition. Based on data from WHO Global Status Report on Non-Communicable Diseases 2014, high sugar and salt consumption combined with low consumption of fruits and vegetables for certain period of time will induce any diseases. One way to raise consumers' vegetable consumption is through including vegetables itself on their snacks, which is chips. By transforming the composition of current potato chips into a healthier one (low MSG, low salt, vegetable-based ingredients), there is a chance for Indonesian to be healthier from current state.

1.6.2 Conceptualizing Discrete Choice Experiment

In this research study, every participant has only one chance to fill in the survey and the result will be gathered from every participants' responses. Discrete Choice Experiment is used to examine the impact of product attributes. A way to do discrete choice experiment is through Conjoint Analysis. Conjoint analysis has been widely used in marketing to evaluate consumer preferences for products and services (Hair et al., 1998). Although consumer preference is hard to measure, it is still possible to measure them by finding out what attributes are important in the eye of consumers. Moreover, Green and Krieger (1991)

mentioned the usefulness of conjoint analysis for benefit segmentation. This could help snack companies in choosing the right segment in the market. The necessary data to carry out conjoint analysis consist of consumer evaluations of alternative product concepts described as sets of attributes levels (Gil and Sanchez, 1997). The DCE consisted of five product attributes, with two up to three levels in each attributes. Furthermore, attributes level must be chosen carefully to represent what would be realistic in the market, and should cover the entire range or representative levels (Gil and Sanchez, 1997). Given such information, selected attributes are based on the data from exploratory research, through in-depth interview as well as from previous studies. Moreover, the attributes and levels altogether forming choice sets, and these choice sets will be presented in the online survey as alternatives. Limited number of attributes and levels are chosen to avoid respondent fatigue which could biasing the survey answer or quitting the survey. Lastly, the DCE was created based on a combination of fractional factorial and orthogonal design (Aizaki, 2012).

1.6.3 Data Collection

This research study will be using Qualtrics as a platform to do an online survey, and it is expected to collect 100 responses. According to Quester and Smart (1998), the recommended sample size to achieve reliable results from conjoint analysis is 100-200 responses. Moreover, the survey will be distributed to males and females in Indonesia mainly of people aged 18 to in their 40s. Each respondent will be provided with ten choice sets, which they have to choose one out of two alternatives in each question. In addition, Likert chart with 7 points scale will be used to ask respondents' level of health consciousness and the level of their concern toward food's ingredients. Respondents will be given several statements, and they have to indicate to what level they agree with the statements. Lastly, demographic questions will also be included in the survey in order to get

more depth information about the respondents. These passive variables can be very useful in drawing a conclusion in Chapter 5.

Chapter 2
Theoretical Framework

This chapter contains academic materials that are related to this research study. Basic theory about segmentation will be explained. The role of product attributes in revealing consumers' preference will be discussed. A low effort decision-making process will also be discussed since the product in this research study is categorized as a low-involvement product. Psychographics will be mentioned, explaining how each consumer might end up having a different preference. Lastly, the hypothesis will be formulated at the end of this chapter.

2.1 Segmentation

Segmentation takes a big role in the marketing field. According to Smith (1956), a marketing segment is a specific group in a market with unique criteria. Consumers within such a sub-market are assumed to be quite similar in their needs, characteristics and behaviors. Furthermore, there are two purpose of market segmentation: to divide a market into several homogenous sub-markets and to formulate a proper marketing-mix strategy for the sub-market (McCarthy, 1981). Hence, by knowing the characteristics of each market segments, marketers can target the right consumers based on their unique characteristics.

2.2 Product Attribute

Discrete Choice Experiment is used in this research study to reveal consumers' preference. DCE implemented in a survey comprising several choice sets, each containing hypothetical options between which respondents choose. Each option consists of several attributes, and each attribute takes several levels (Lancsar and Louviere, 2008). Product attributes take a big role in the marketing study. According to Fader and Hardie (1996), consumers' utility for a product is not a

direct function of the product itself. Rather, it depends on the product's attributes and consumers' taste. Consumers value some attributes superior over the others, which indicate their true preference for a product. Moreover, product's attributes can be quantitative or qualitative and are generally identified from the literature, qualitative research such as semi-structured interviews, and/or focus groups with samples of relevant respondents and experts. Furthermore, a wide range of levels should be used to prevent respondents from ignoring attributes because of levels similarity (Lancsar and Louiviere, 2008). By knowing the important attribute of the consumers, this will help the company's manager to create more effective and efficient strategy in producing and selling the product.

2.3 Low Effort Decision Making Process

Consumers choose a product to buy through a decision-making process. During the decision making process the consumers retrieve from long-term memory, those products which they are aware of. This small set of brands (the consideration set) is important, since they only choose a brand which belong in the consideration set (Mowen and Minor, 2001). Moreover, products are categorized into two parts, high-involvement product and low-involvement product.

Consumers often buy a high-involvement product for its symbolic meaning, image reinforcement or psychological satisfaction (Solomon, 1986). On the other hand, for a low-involvement product, it undergoes a low-effort decision-making process. The search for information to evaluate alternative brands in this type of decision-making process is minimal. For that reason, consumers are less likely to stay with the same brand over time because of the risk of making a poor decision is low. According to Keller (1993), consumers do not always spend a great deal of time or cognitive effort in making purchase decisions. They often try to minimize decision-making by using a heuristic such as "buy the brand I have

heard of" or "choose the brand I know" and then purchase only familiar, well-established brands. Macdonald and Sharp (2003) added by saying that familiarity has a greater effect on the quality perception of a brand than its physical characteristics do. From given information, it brings challenges for the marketer to allow their product to become stand out from competitors. Furthermore, products that belong to low effort decision-making process are commodity products, which consumers buy the product repeatedly.

There are two low-involvement buying decision: inertial purchasing and impulse buying. Inertial purchasing is the when consumers stick to one brand to escape from making choice. On the other hand, impulse buying is when consumers impulsively decide to buy a different brand to experience variation (Mullins and Walker, 2013).

2.4 Psychographics: Values, Personality, Lifestyles

According to Hoyer et al., (2013), the definition of psychographics is a description of consumers based on their psychological and behavioural characteristics. Marketers use psychographics to get more specific understanding of consumer behaviour than they can get from demographic variables. Psychographics encompass individuals' values, attitudes/personality, and lifestyle (Barber et al., 2012).

Values are enduring beliefs that a given behaviour or outcome is good or bad (Hoyer et al., 2013). In addition, values are considered as the criterion that individuals use to select and justify their actions and to value objects and the other's conduct. Every individual has a specific value structure (Fraj and Matinez, 2006). Values are shaped by means of people's experience and learning process. Thus, people who behave health consciously, express their value of respect toward their health condition by having a positive attitude towards buying healthy products (Kahle, 1996). Moreover, consumers' value gives marketers a direction

on how best to satisfy their customer needs and increase brand preference (Chudy and Sant, 1993). Hence, consumers' value is one appropriate variable to determine market segment.

Personality is an internal characteristic that determines how individuals behave in various situations (Hoyer et al., 2013). Everyone has a different personality, this is one reason why people might behave differently in different situation. As Becker et al., (1981) have tried to divide consumer markets by looking at a consumer's personality. Furthermore, it is believed that individual differences in personality traits can also explain differences in the healthiness of one's lifestyle. One personality trait that would appear to have relevance in this regard is the locus of control (Divine and Lepisto, 2005). Based on Villani and Wind (1975), a locus of control is defined as the extent to which one believes they are in control of their life (internal orientation) as opposed to believing their life is being controlled by outside forces (external orientation). Hence, personality is another variable to determine market segment.

Lifestyles is somewhat related to values and personality. While values and personality are internal states, lifestyle is the external state (Hoyer et al., (2013). Consumers define lifestyles by the consumption choice they make in a variety of product categories. Therefore, lifestyle can be used as a group identifier for market segmentation (Lin, 2002).

Lastly, consumers' value, personality, and lifestyles can explain why each consumer might have a different preference toward products, and they will be formed in groups based on their unique characteristics, which refers to their segment.

2.5 Hypothesis Formulation

Price

Price is one attribute that consumers are always aware of when deciding which product to buy. When offering products, it is important to always include the price

of the product in the offering. French (2003) indicate that price is an important factor in food choice. Other researchers also found that price had a significant effect on demand (Mojduszka et al., 2001). Therefore, the following is hypothesized:

H1: Price has a significant effect in determining consumer preference toward chips product

Main Ingredients

Another attribute that takes a big role in consumers' mind when making a decision is the type of main ingredients of chips product. In this research study, the common main ingredient of chips product in the market is potato, refers to potato chips. However, there has been a debate going on about other types of ingredients that might deliver greater benefit to consumers' health condition. Rolls et al., (2004) indicate that eating vegetables can help control weight as they are low in calories and high in fiber. Gillman (1996) also added by saying that vegetables are an excellent source of potassium and can work as a protection against the common chronic diseases. From given information, it is clear that different main ingredient carries different benefit to consumers' health condition. Therefore, the following is hypothesized:

H2: Type of main ingredients have a significant effect in determining consumer preference toward chips product

Level of MSG Usage

Monosodium Glutamate (MSG) is one substance that gives a rich flavour to chips product. MSG was first derived from a brown kelp commonly used to make broth in Japanese cuisine (Halpern, 2002). The more MSG contained in chips product, the more flavor it will serve. However, there has been a debate going on about the effect of the amount of MSG usage in food products. Psychiatrist John W. Olney reinforced the dangers of MSG through his experiment on lab mice, which

resulted in infertility over long periods of exposure to the food additive (Olney, 1969). In addition, other researchers argue that MSG becomes a problem when over 3g are consumed per meal (Meadows, 2003). From given information, it is believed that consumers should take a close attention to the level of MSG usage in chips product. Therefore, the following is hypothesized:

H3: Level of MSG usage has a significant effect in determining consumer preference toward chips product

Level of Salt Usage

Sodium chloride (NaCl) or salt is another attribute that takes a role in chips product. Salt is a valuable commodity which is used extensively in food processing. It is a cheap and versatile product (MacGregor, 1998; Whitehead, 1998). The existence of salt in the food product is essential as MacGregor (1998) indicates that high salt concentrations are necessary for processed foods because many food items would otherwise be inedible. However, Gibson et al., (2000) argue that salt can be harmful when consumed in excess. In addition, NACNE and COMA reports suggest that, a lower intake of sodium chloride would be beneficial to health since the high salt intake is believed to be related to a higher incidence of hypertension and possibly to coronary heart disease. Hence, it is believed that consumers should take a close attention regarding the amount of salt consumption, and the following is hypothesized:

H4: Level of salt usage has a significant effect in determining consumer preference toward chips product

Packaging Material

Many firms neglect the importance of packaging design, material, etc. However, packaging takes a big role in a product, which might affect consumers' process of making a decision to choose which product to buy. Rundh (2009) indicates that packaging has become an important factor in marketing diverse "consumer

goods" and have a key role in communicating product benefits to the consumer. Olsen and Jacoby (1972) also added by saying that individuals evaluate quality through extrinsic attributes, especially when intrinsic cues are not directly provided. Furthermore, another thing to mention is that more and more consumers are becoming more concern on an environmental issue. Hence, eco-friendly packaging is needed. As Van Birgelen et al., (2009) revealed that consumers are willing to trade off almost all product attributes in favour of environmentally friendly packaging, except for taste and price. From given information, it is believed that consumers do actually take a close attention to the packaging material. Therefore, the following is hypothesized:

H5: Packaging material has a significant effect in determining consumer preference toward chips product

Health Consciousness

Health consciousness has been an interesting topic among consumers. As more and more people realize how important it is to maintain a good health condition, people actually do watch what they consume. McIlveen (1994) mentions how health conscious behaviour reflects on food choice, as concern for proper nutrition on consumption choice. Consumers with health-conscious behavior are believed to take a close attention to the ingredients of a food product, which in this study refers to healthy chips. Therefore, the following is hypothesized:

H6: Health consciousness has a significant effect in determining consumer preference toward chips product

Demographic Variable (Age and Gender)

One thing that should not be forgotten is demographic variables. These variables are passive variables, yet they might take an important role in determining consumer preference. Demographic variables that being mentioned in this research study are gender and age. Talking about gender, research data are

somewhat mixed with regard to which gender is more likely to maintain a healthy lifestyle. The BRFSS data indicate that women are more likely to watch their diet while men are more likely to exercise (Divine and Lepisto, 2005). Moreover, regarding age, many researchers found that older people are more likely to maintain healthier diets (Shiu et al., (2004), Huston and Finke (2003) and Mothersbaugh et al., (1993). Hence, it is believed that gender and age do play a role in determining consumer preference, and the following is hypothesized:

H7: Gender has a significant effect in determining consumer preference toward chips product

H8: Age has a significant effect in determining consumer preference toward chips product

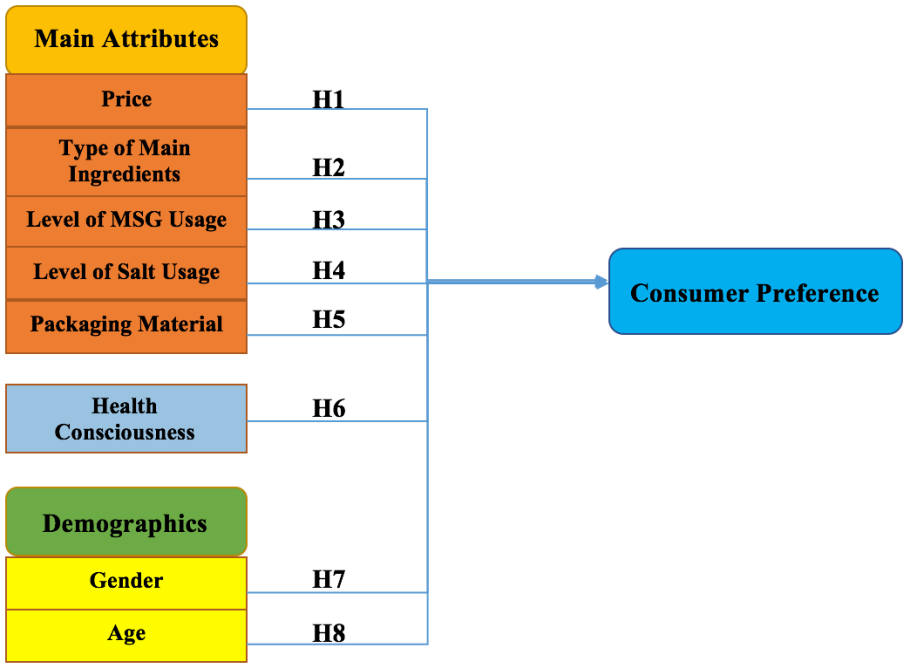


Figure 1. Theoretical Framework

Chapter 3
Research Methodology

This research study is an experimental base that aims to figure out consumers' true preference. By doing an experiment, there will be clear manipulated variables and also allow the researcher to avoid any circumstances that might arise from only doing an observation. From an observation, the result can be bias and does not provide consumers' true preference. Furthermore, this research study is considered as an artefactual field experiment, which serves artificial task, artificial context, with real respondents. JMP and SPSS are a statistical package that will be used in this research study to analyze the data. Experimental designs are created through JMP which eventually will provide choice sets. SPSS is used to calculate the data from Likert scales.

3.1 Research Design

This research study is categorized as a within-subject experiment, where respondents will participate in more than one treatment condition. This contradicts with a between-subject experiment where a different group of respondents are assigned randomly to each different condition. The condition will be formed automatically through JMP and exposed to the respondents to create a trade-off between choices. There are few advantages and disadvantages of within-subject design. The advantages are; fewer respondents are needed, the experiment can be more efficient because it does not require any time to train the respondents, and it will generate greater statistical power since the researcher can get various information about the respondents in many conditions. On the other hand, the disadvantages are; respondents are forced to participate longer in the experiment which can lead to fatigue as well as learning effect which can lead to bias results.

3.1.1 Discrete Choice Experiment

Discrete choice experiment (DCE) will be used in this research study to reveal consumers' preference. According to Lanscar and Louviere (2008), there is growing recognition that DCEs can provide more than information on preference. In particular, they have the potential to contribute more directly to outcome measurement for use in economic valuation. In this research study, consumers' stated preference will be discovered. Stated preference is a preference which individuals say they would do rather than what they are observed to do (Lanscar and Louviere, 2008). They also mention, through DCE, it allows the researcher to know the value of a product for which markets have not yet exist. DCE typically applied in surveys consisting choice sets which contain hypothetical options that force respondents to choose between several options.

In this research study, respondents are given multiple options or choice sets rather than only evaluating one single treatment condition. Each option consists of the same attributes with different levels. According to Lanscar and Louviere (2008), the specification of suitable numbers of attributes and levels is context specific. However, a high number of attributes as well as a high number of levels should be avoided for simplicity reason. There will be five attributes with two up to three levels on each attribute. The researcher should balance the utilities of the alternatives offered in the choice sets. Alternatives within each choice set should have equal probabilities to be chosen (Huber and Zwerina, 1996). Moreover, the type of experimental design in this research study is fractional factorial design. In fractional factorial design, it guarantees orthogonality between variables. Some interactions are not significant, so these interactions are set equal to zero. Lastly, the fractional factorial design minimizes the number of task respondents has to go through to avoid respondents drop out. This needs to be considered due to any possibility of respondent drop out.

3.1.2 Random Utility Theory

Consumers choose a product based on its utility, and they choose the one with the highest utility amongst all. Utility is a latent, unobserved quantity. Researchers observe only indicator of utility, which called choices (Lanscar and Louviere, 2008). The utility of a product can be measured by taking a weighted sum of the part-worth utilities of its attributes. Furthermore, Lancaster (1966) suggests the good per se does not give utility to the consumers. Rather, it possesses characteristics and these characteristics give rise to a utility. He added by saying, a goodwill possesses more than one characteristics or attributes, and many characteristics will be shared by more than one good. One example of good's characteristic is price, and many other products also have price as their characteristic. Based on previous research, price is the most influential characters in determining product's utility (Mojduszka et al., 2001).

This research study applies random utility theory. Researchers can only observe consumers' choice with errors. Also, consumers unconsciously make errors in determining preference. According to Payne et al., (1993), these errors are perceptual error and cognitive calculation error. Hence, a utility is formed using a stochastic model, meaning including error term in the utility function. Furthermore, this research study provides two alternatives in each choice set. From given information, it applies a probabilistic choice rule, meaning the chance that an alternative is chosen depends on the probability that its utility is larger than another alternative. In addition, if errors are independently and identically Gumbel, JMP will generate the binary logit model. Based on the explanation above and modified version from Putrityas (2016), the utility function is formulated as follows:

$$U_i^{chips} = x_p\beta_p + x_{mi}\beta_{mi} + x_{MSG}\beta_{MSG} + x_{salt}\beta_{salt} + x_{pm}\beta_{pm} + \varepsilon_i$$

U_i^{chips} = Utility of chips i

x_p, x_{mi}, ……, x_{pm} = attributes' utility

β_p, β_{mi}, ……..., β_{pm} = attributes' coefficient

$x_p\beta_p$, $x_{mi}\beta_{mi}$, ……..., $x_{pm}\beta_{pm}$ = systematic utility

ε_i = error term

3.1.3 JMP Choice Design

There are two steps in choice experimental design; first, creating treatments, then the second step is to put the treatments in the choice sets. Respondents will be given ten choice sets including products' profile, and ask them to choose one out of two alternatives.

Prior information about the alternatives is used in this research study to improve the predictive power of the model. This prior information is inputted under "Prior Specification" in JMP. Furthermore, the prior specification is divided into two categories; prior mean and prior variance matrix. Researchers use prior knowledge or educated guess to specify β_0 (Huber and Zwerina, 1996). For example, one prior knowledge in this research study is that lower price is always more attractive than a higher one. Furthermore, β_0 is set equal to 1 and 0, as 1 indicates certainty and 0 indicates uncertainty. Most preferred attribute levels appear last. The negative sign is commonly used to indicate attribute levels that appear first in the model is less preferred than the one that appears last. Moreover, 0 in prior variance matrix is set equal to 1 to indicate uncertainty since there is no data from a pilot study. 20 combination of attribute levels is formed through JMP, which result in 10 choice sets. These choice sets represent as Alternative 1 and Alternative 2 in the survey.

3.2 Measures

The choice sets in this research study are assembled from five attributes with two up to three levels for each attribute. Both attributes and levels are determined based on exploratory research. The attributes and levels are as follows:

Price	Rp. 18,000	Rp. 15,000	Rp. 12,000
Main Ingredients	Potato	Vegetables	-
Level of MSG Usage	High	Low	None
Level of Salt Usage	High	Low	None
Packaging Material	Plastic	Paper	-

Table 1. Product's Attributes and Levels

In this research study, all combinations are assumed to come in one size, medium size (68 grams). The reason is because most chips products in Indonesia are produced in given size. Moreover, respondents are also being asked few demographic questions such as; their level of health consciousness, level of their concern toward food ingredient, gender, and age. Respondents are given stating agreement through Likert scale to measure their concern level with the following items:

Health Consciousness Scale (1-7 scales)
"I think of myself who is concerned about health issue"
"I reflect about my health a lot"
"I'm very self-conscious about my health"
"I'm alert to changes in my health"
"I'm usually aware of my health"
"I take responsibilities for the state of my health"
"I'm aware of the state of my health as I go through the day"

Food Ingredient Concern Scale (1-7 scales)
"I'm very concerned about the amount of MSG in food"
"I'm very concerned about the amount of salt in food"
"The quality of food product nowadays concerns me"

Health consciousness scales are based on previous study by Gould (1998), and Food ingredient concern scales are based on previous study by Roddy *et al*., (1996). The scales start with point 1 indicating "strongly disagree" and ends with point 7 with "strongly agree". In order to draw a conclusion, the data from these Likert scales are gathered and calculated through SPSS.

3.3 Data Collection

The online survey will be created through a platform called Qualtrics and will be distributed to both males and females in Indonesia mainly of people age 18 to in their 40s. People within those age range are chosen because they are considered to be the loyal customers of chips product. Each respondent will be given 10 choice sets and asked to choose one option out of two. Furthermore, Likert scale with 7 points scale will be used, and demographic questions will be asked. These demographic questions contribute as passive variables which will serve additional information when drawing a conclusion.

Chapter 4

Data Analysis

This chapter will consist of several parts; discussing about survey results, survey items' reliability, utility analysis through JMP, hypothesis results, as well as summary of results.

4.1 Survey Results

The online survey of this research study was distributed informally through social media. The total response was 125, more than expected. However, only 100 response data were used due to respondents quitting the survey. Furthermore, 65% of the respondents were females and the other 35% were males. This uneven distribution was believed due to several limitations, which will be discussed further in Chapter 5. Moreover, 77% of the respondents were people in their 20s, followed by 14% of the respondents were below 20, 6% of the respondents were in their 30s, and 4% of the respondents were in their 40s. Consistent reason applies, this uneven distribution was due to limitation of time and other factors. The full overview can be seen in the Appendix.

Regarding the level of health consciousness among Indonesian consumers, the survey result which generated by SPSS concludes that Indonesian consumers are health conscious with a mean of 5.39 out of 7 points scale. The findings yield to a relieving news, knowing that Indonesian already started to concern with their health conditions.

N	Minimum	Maximum	Mean
100	2.86	7.00	**5.39**

Table 2. Level of Health Consciousness among Indonesian

Another surprising result comes from the level of awareness among Indonesian consumers toward food's ingredients. Based on the survey result, it shows that Indonesian consumers are aware of food's ingredient that they consumed. It is

proven with a mean of 4.82 out of 7 points scale. Specifically talking regarding this research study, it demonstrates that Indonesian consumers take a close attention to the type of main ingredients, level of MSG usage, and level of salt usage. This is surely a good sign knowing that there is particular awareness among Indonesian consumers.

N	Minimum	Maximum	Mean
100	2.00	7.00	**4.82**

Table 3. Level of Food Ingredients Concern Indonesian

4.2 Survey Items' Reliability

To check the reliability of an online survey, SPSS is used to measure Cronbach's Alpha. This is one important step in research study to avoid any bias data due to unreliable survey items. Any data which has a Cronbach's Alpha score above 0.6 is indicated as reliable. The data from two categories are computed separately. From the computation, both categories have high Cronbach's Alpha score, 0.86 and 0.75 respectively. It indicates that the survey items are reliable.

Health Consciousness Scale Items	Mean	Std. Deviation	Cronbach's Alpha
I think of myself who is concerned about health issue	5.34	1.14	**0.86**
I reflect about my health a lot	5.13	1.12	
I'm very self-conscious about my health	5.23	1.17	
I'm alert to changes in my health	5.38	1.22	
I'm usually aware of my health	5.47	1.02	
I take responsibilities for the state of my health	5.47	1.04	
I'm aware of the state of my health as I go through the day	5.42	1.03	

Table 4. Item Reliability for Health Consciousness

Food Ingredients Concern Scale Items	Mean	Std. Deviation	Cronbach's Alpha
I'm very concerned about the amount of MSG in food	4.54	1.64	**0.75**
I'm very concerned about the amount of salt in food	4.57	1.55	
The quality of food product nowadays concerns me	5.35	1.27	

Table 5. Item Reliability for Food Ingredients Concern

4.3 Utility Analysis

The purpose of using JMP is to find consumers preference by measuring their utility toward product attributes. In addition, JMP provides many functions which serve many different kind of analysis. The functions which take part in this research study are: Likelihood Ratio Test, Effect Marginals, Utility Profiler, and Construct Subject Effect. Each function and the survey result will be discussed below.

4.3.1 Likelihood Ratio Test

After computing all variables on JMP, several models were run. The first model is using all five main attributes to generate base construct profile effect, and followed by adding various construct subject effect.

In the basic model, four out of five attributes are significant with p-value < .0001. These four attributes are: price, main ingredients, level of MSG usage, and level of salt usage. From given result, it turns out that packaging material is the only attribute that is insignificant. The full overview can be seen in the Appendix.

Next, several additional variables are added to the model to generate construct subject effect. These variables are: age, gender, and respondents' level of health consciousness. The models are being run three times separately, for each different variable.

When one variable (age) is added to the model, there is no significant interaction between age to any main attributes. It indicates that age does not play an important role in respondents' behavior in choosing chips product. Furthermore, another variable (gender) is added to the model. Surprisingly, there is also no significant interaction between gender to any main attributes. It shows that whether the respondents are male or female, it does not really affect their

preference toward chips product. The last variable that is added to the model is respondents' level of health consciousness. Again, the result shows that there is no significant interaction between respondents' level of health consciousness to any main attributes. This indicates that consumers' preference toward chips product won't be affected by the level of their health consciousness. Regardless of how concern they are with their health condition, they will stick to their preference. Full overview of these models can be seen in the Appendix.

4.3.2 Effect Marginals

In order to gain more insight about relative importance of the attributes, the effect marginals were examined. Effect marginals consist of marginal utility and marginal probability. Marginal utility is the utility value of certain level of attributes, relative to other levels of attributes, if that level of attribute is chosen. On the other hand, marginal probability is the probability that certain level of attribute is chosen relative to other levels of attributes, by the respondents.

The largest marginal effect belongs to the level of MSG usage. The marginal utility of high MSG is estimated at -0.47605 and the marginal utility of low MSG is 0.31796, for a total range of roughly 0.80. Although there is only a small margin, but the given information indicates that most respondents highly prefer low MSG compared to high or none MSG. Furthermore, the total range of marginal utility for main ingredients, level of salt usage, price, and packaging materials are 0.68, 0.58, 0.52, and 0.08 respectively. Potato as the main ingredient, low salt, a price of Rp. 15,000, and paper packaging is preferred more by the respondents relative to other levels of attributes. Furthermore, marginal utility has direct relationship with marginal probability, shown by an increase in marginal utility also lead to an increase in marginal probability. For example, potato as the main ingredient has the highest positive utility amongst all, and its marginal probability is also the highest.

In addition, the results are in line with the prior means that were computed earlier. A price of Rp. 15,000 is preferred more than Rp. 18,000, low MSG and low salt are preferred more than high MSG and high salt. However, one result is not in line with the prior mean, which is a price of Rp. 12,000. On the prior mean, a price of Rp. 12,000 is assumed to be more preferred relative to two other levels. In fact, a price of Rp. 15,000 has the highest marginal utility relative to other levels of price as an attribute. This result may indicate that consumers tend to feel safer by choosing a product with moderate price.

Attributes	Levels	Marginal Utility	Marginal Probability
Price	Rp. 18,000	-0.12289	0.2867
	Rp. 15,000	0.32302	0.4478
	Rp. 12,000	-0.20013	0.2654
Main Ingredients	Potato	0.33757	0.6627
	Vegetables	-0.33757	0.3373
Level of MSG usage	High	-0.47605	0.1962
	Low	0.31796	0.4340
	None	0.15808	0.3699
Level of salt usage	High	-0.33048	0.2328
	Low	0.25364	0.4174
	None	0.07684	0.3498
Packaging Material	Plastic	-0.04206	0.4790
	Paper	0.04206	0.5210

Table 6. Product's Attribute Marginal

4.3.3 Utility Profiler

Utility profiler is a function in JMP which gives the most attractive product profile based on respondents' responses. The finding shows the most attractive product profile is potato chips, which contain low MSG and low salt, with a price of Rp. 15,000, in paper packaging. Full overview of utility profiler can be seen in the Appendix.

4.4 Hypothesis Result

In this part, each hypothesis will be answered and discussed.

4.4.1 Hypothesis One

H1: Price has a significant effect in determining consumer preference toward chips product

Based on the Likelihood Ratio Test, price is significant with p-value < .0001. This result indicates that consumers do consider price of a product as an important attribute in determining their preference. In other words, consumers are aware with product's price while deciding a product to buy. Furthermore, this research study found a price of Rp. 15,000 to be the most preferred one. This moderate price might be chosen by the respondents due to multitude of reasons. Respondent might feel safer by choosing moderate price, as there are group of people in the market who like to choose the moderate option because they are risk neutral. These respondents might belong to this particular segment. In addition, they might think Rp. 18,000 is too expensive for a 68 grams chips product, and they also might question the quality and taste of a Rp. 12,000 chips product, since cheap product usually associates with low quality and bad taste. Since consumers consider price of a product is important and JMP proves that it is significant with p-values < .0001, hence it can be concluded that hypothesis one is accepted.

4.4.2 Hypothesis Two

H2: Type of main ingredients have a significant effect in determining consumer preference toward chips product

Based on the Likelihood Test Ratio, the type of main ingredient has a significant effect in determining consumer preference toward chips product. Based on data generated through JMP, type of main ingredient is significant with p-value < .0001. It implies that each consumer has their own preference regarding chips' main ingredient and it will affect their decision when choosing a product to buy.

Specifically, in this research study, most respondents tend to like potato as the main ingredient. This result might due to Indonesian culture which eat rice in everyday life, indicating that they are more familiar with eating carbs relative to vegetables. In addition, the result might also due to unfamiliarity of Indonesian consumers toward vegetable chips. As the purpose of this research study at the first place is to see consumers' preference toward vegetable chips as there is no vegetables chips being sold in Indonesia yet. From given result, it can be said that consumers consider the main ingredient as an important attribute and JMP also proves it to be significant with p-value < .0001, which make the hypothesis two accepted.

4.4.3 Hypothesis Three

H3: Level of MSG usage has a significant effect in determining consumer preference toward chips product

Just like previous hypothesis, the result shows that the level of MSG usage has a significant effect in determining consumer preference toward chips product, proven by JMP data showing the level of MSG usage is significant with p-value < .0001. The result is also generated by the Likelihood Test Ratio on JMP. Furthermore, this research study reveals that consumers prefer chips product with low MSG relative to chips product with high or none MSG. This is in line with the discussion in Chapter 2 earlier, mentioning about health risk of consuming too much MSG. Moreover, the result provides relieving news as Indonesian already recognized about how important it is to limit the amount of MSG consumption. In other words, consumers consider the amount of MSG in chips product as an important attribute, and JMP also proves it to be significant with p-value < .0001 which allow it to be concluded that hypothesis three is accepted.

4.4.4 Hypothesis Four

H4: Level of salt usage has a significant effect in determining consumer preference toward chips product

The result from Likelihood Ratio Test indicates that the level of salt usage has a significant effect in determining consumer preference toward chips product. This variable is significant with p-value < .0001. Furthermore, the result which generated through JMP shows that chips product with low level of salt is the most preferred one. This is a terrific sign, indicating that Indonesian already aware with the importance of limiting the amount of salt consumption. Also, the result is in line with previous discussion when the hypothesis was formulated. From given information and the result from JMP which show the variable is significant with p-value < .0001, it can be concluded that hypothesis four is accepted.

4.4.5 Hypothesis Five

H5: Packaging material has a significant effect in determining consumer preference toward chips product

As other four main attributes are significant, packaging material is the only attribute that is proven to be insignificant. This variable is insignificant with p-value 0.53. From this results, it indicates that consumers do not really pay attention to packaging material when choosing a product to buy. This might due to lack of strict regulation in Indonesia regarding recycle materials. Many Indonesian use plastics in everyday life, without concerning the aftermath, environmental damage, for instance. In addition, plastic waste in Indonesia keep increasing throughout the year, with an estimate increase of 6-7% per year (lipi.go.id). It can be said that there is no awareness among Indonesian toward environmental issue. From given result and information, it can be concluded that hypothesis five is rejected.

4.4.6 Hypothesis Six

H6: Health consciousness has a significant effect in determining consumer preference toward chips product

Based on the result of Likelihood Ratio Test, health consciousness has no significant effect in determining consumer preference toward chips product. After adding into the construct subject effect, the variable does not have any significant relationship with any of the main attribute. This indicates that regardless how concern they are regarding their health condition, their preference toward chips product will not be affected. This might result from multitude of reasons. As being mentioned before, consumers in Indonesia are not familiar with vegetable chips. Thus, although they have certain level of health consciousness, they might have ended up choosing to eat something that seems tastier and something that they are familiar with. Another reason is because chips product is categorized as low-involvement products. Hence, it allows the consumers to go through simpler decision making process, which allow them to neglect several factors. From given result, it can be concluded that hypothesis six is rejected.

4.4.7 Hypothesis Seven

H7: Gender has a significant effect in determining consumer preference toward chips product

The result of Likelihood Ratio Test indicates that gender has no significant effect in determining consumer preference toward chips product. It means that both male and female don't have any significant difference in their preference toward chips product. Again, this might due to the category of the product, which is low-involvement product. Since it is a low-involvement product, they do not really have specific preference which differentiate them from one and another. From given result, it shows that gender has no significant effect in determining consumer preference which allows hypothesis seven to be rejected.

4.4.8 Hypothesis Eight

H8: Age has a significant effect in determining consumer preference toward chips product

Like previous result, Likelihood Ratio Test also shows that age has no significant effect in determining consumer preference toward chips product. This result implies that consumers with different age might have the same preference. In other words, consumers within a specific range of age do not have their own certain chips preference which differentiate them from other group of people at different age. One reason to explain this finding is due to Indonesian habit to eat chips product most of the time, regardless any age differences. In addition, constant reason applies, because the product is considered as low-involvement product which allow the consumers to shortened the decision-making process and neglect several factors. From given result, it can be concluded that age has no significant effect in determining consumer preference which makes hypothesis eight to be rejected.

4.5 Summary of Results

Hypothesis	Results
H1: Price has a significant effect in determining consumer preference toward chips product	**Accepted**
H2: Type of main ingredients have a significant effect in determining consumer preference toward chips product	**Accepted**
H3: Level of MSG usage has a significant effect in determining consumer preference toward chips product	**Accepted**
H4: Level of salt usage has a significant effect in determining consumer preference toward chips product	**Accepted**
H5: Packaging material has a significant effect in determining consumer preference toward chips product	**Rejected**
H6: Health consciousness has a significant effect in determining consumer preference toward chips product	**Rejected**
H7: Gender has a significant effects in determining consumer preference toward chips product	**Rejected**
H8: Age has a significant effect in determining consumer preference toward chips product	**Rejected**

Table 7. Hypothesis Summary Result

Chapter 5
Conclusion and Recommendation

In this last chapter, conclusion, managerial implication, limitation and input for further research will be discussed.

5.1 Conclusion

In this part, the main research question will be answered and the results of this research study will be summarized. Recall the main research question as follows:

What is the importance of product attributes and health consciousness on consumer's preference of chips product?

Based on the survey results that are generated through JMP and SPSS which discussed in Chapter 4, it becomes possible to answer the main research question. Given the generated data, product's attributes play a significant role on consumer's preference toward chips product. From five main product's attributes (price, main ingredient, level of MSG usage, level of salt usage, and packaging material), only one of the attribute results in statistically insignificant (packaging material). This result indicates that product attributes are an important aspect among consumers in determining their preference toward chips product. However, health consciousness has contradicted result. When the variable is analyzed separately, it tells that Indonesian consumers are health conscious with a mean of 5.39 out of 7 points scale. Yet, this result does not indicate that Indonesian consumers consider this variable as an important aspect in determining their preference toward chips product, which shown by a result in JMP. The result implies that health consciousness is statistically insignificant in determining consumer preference. In other words, their preference will not be affected regardless the level of their health consciousness. Moreover,

demographic variables such as gender and age are also added to the model, yet none of these variables are significant to consumer preference.

To conclude, product attributes take an important role in determining consumer preference, whereas health consciousness barely play a role in determining consumer preference. In brief explanation, given information indicates that Indonesian consumer consider product attributes and neglect the level of health consciousness in building their preference toward chips product. When demographic variables such as gender and age were added to the model, the results show that these variables will not affect consumers' preference in any way. Furthermore, referring to the problem in Chapter 1, the finding demonstrates that Indonesian consumers started to shift to healthier snack, although they still prefer potato relative to vegetables as the main ingredients. Hence, by preferring low MSG and low salt, it already gives a clue to marketers that they have some interest toward healthy snacks.

5.2 Manager Implication

The purpose of this research study is to see consumers' preference toward chips product, and the result can represent as an insight to the managers. Everyone has their own preference, and it is always a correct decision to conduct a market research beforehand. From the market research, managers will identify what are the product attributes that seem important in the eye of consumers. By knowing this information, managers can focus on improving the performance of important attributes and consequently will lead to more effective and efficient business production.

The output of market research serves the most attractive product profile, which is a potato chips, which contain low MSG and low salt, with a price of Rp. 15,000,

in paper packaging. From given information, managers get insight regarding consumers' preference and expected to make use of the information effectively.

5.3 Limitation and Input for Further Research

Although this research study reaches a clear result and conclusion, there are several limitations that need to be considered. Firstly, time limitation is the biggest challenge in this research study. Because of the limitation of time, only 100 responses are collected. Moreover, these 100 respondents have unequal distribution of gender and age which could raise a question regarding the representativeness of the population. Secondly, the online survey has been distributed informally through social media. Thirdly, most of the respondents are living in the same area, in Java Island, Indonesia.

Therefore, there are several aspects that must be contemplated for further research. It would be better if there are no time constraints, which allows the researcher to get more respondents and get the right representative of the population. Moreover, the researcher should distribute the online survey to the classified respondent that meets the criteria. The distribution of the online survey should be done in a more formal manner, by selecting the respondent. One way to do this is by sending emails to all the expected respondents. Furthermore, the online survey should also be distributed in a wider geographical scope, since Indonesian consumers eat chips in their leisure times regardless the location of where they live. It should be distributed to everyone in all different islands, or everywhere throughout Indonesia. By implementing given recommendations, it is believed that the researcher will obtain clearer and less bias result.

REFERENCES

Aizaki, H. (2012), "Basic functions for supporting an implementation of choice experiments in R", Journal of Statistical Software, Vol. 50 No. 9, pp. 1-24.

Bakke J. L., Lawrence, N., Bennett, J., Robinso, S., & Bowers, C. Y. (1978). Late endocrine effects of administering monosodium glutamate to neonatal rats. Neuroendocrinology, 26(4), 220-228.

Becker, B.W. and Conner, P.E. 1981), "Personal values of the heavy user of mass media", Journal of Advertising Research, Vol. 21, pp. 37-43.

Bo Rundh, (2009) "Packaging design: creating competitive advantage with product packaging", British Food Journal, Vol. 111 Issue: 9, pp.988-1002

Cahyani, A. D., Ispurwanto, W., Rumeser, J. A., & Setyorini, A. (n.d.). Eating Habit among Workers in Jakarta. Retrieved from https://publikasiilmiah.ums.ac.id/bitstream/handle/11617/7361/4 - Anggita Dian Cahyani.pdf?sequence=1

Chin-Feng Lin, (2002) "Segmenting customer brand preference: demographic or psychographic", Journal of Product & Brand Management, Vol. 11 Issue: 4, pp.249-268

Chudy, B. and Sant, R. 1993), "Customer-driver competitive positioning ± an approach towards developing an effective customer service strategy", Marketing and Research Today, Vol. 21, pp. 155-69.

COMA Report, DHSS 1984, *Diet and cardiovascular disease,* Department of Health and Social Security Report on Health and Social Subjects 28, HMSO.

Elena Fraj, Eva Martinez, (2006) "Environmental values and lifestyles as determining factors of ecological consumer behaviour: an empirical analysis", Journal of Consumer Marketing, Vol. 23 Issue: 3, pp.133-144

Fader, P. S., & Hardie, B. G. (1996). American Marketing Association. *Modeling Consumer Choice among SKUs, 33*(4), 442-452. Retrieved from http://www.jstor.org/stable/3152215

French, S.A. (2003), "Pricing effects on food choices", The Journal of Nutrition, Vol. 133 No. 3, pp. 8415-8435.

Gil, M.J. and Sanchez, M. (1997), "Consumer preferences for wine attributes: a conjoint analysis approach", British Food Journal, Vol. 99 No. 1, pp. 3-11.

Gillman, M.W. 1996), “Enjoy your fruit and vegetables”, B.M.J., Vol 313, pp. 765-6.

Gould, S. J. (1988) Consumer attitudes toward health and health care: a differential perspective. *The Journal of Consumer Affairs*, **22** (1), 96-118.

Green, P.E. and Krieger, A.M. (1991), “Segmenting markets with conjoint analysis”, Journal of Marketing, Vol. 55 No. 4, pp. 20-32.

Hair, F.J., Anderson, E.R., Tatham, L.R. and Black, C.W. (1998), Multivariate Data Analysis, 5th ed., Prentice-Hall, Englewood Cliffs, NJ.

Halpern, B. (2002). What’s in a name? Are MSG and umami the same?. *The Journal of Chemical Senses, 27*, 845-846.

Huber, J., & Zwerina, K. (1996). The Importance of Utility Balance in Efficient Choice Designs. *33*, 307-317.

Huston, S. and Finke, M. (2003), “Diet choice and the role of time preference”, The Journal of Consumer Affairs, Vol. 37 No. 1, p. 143.

Jean C. Darian, Louis Tucci, (2013) "Developing marketing strategies to increase vegetable consumption", Journal of Consumer Marketing, Vol. 30 Issue: 5, pp.427-435.

Joanna Gibson, Gillian Armstrong, Heather McIlveen, (2000) "A case for reducing salt in processed foods", Nutrition & Food Science, Vol. 30 Issue: 4, pp.167-173

Kahle, L.R. (1996), “Social values and consumer behaviour: research from the List of Values”, The Psychology of Values: The Ontario

Kaur, C. and Kapoor, H.C. (2001), “Antioxidants in fruits and vegetables – the millennium’s health”, International Journal of Food Science and Technology, Vol. 36 No. 7, pp. 703-725.

Keck, A.-S. and Finley, J.W. (2004), “Cruciferous vegetables: cancer protection mechanisms of glucosinolate hydrolysis products and selenium”, Integrative Cancer Therapies, Vol. 3 No. 1, pp. 5-12.

Keller, K.L. (1993), “Conceptualizing, measuring and managing customer-based brand equity”, Journal of Marketing, Vol. 57, January, pp. 1-22.

Lancaster, K. J. (1966). A New Approach to Consumer Theory. *Journal of Political Economy, 74*, 2nd ser., 132-157. Retrieved from http://www.jstor.org/stable/1828835

Lancsar, E., & Louviere, J. (2008). Pharmaeconomics. *Conducting Discrete Choice Experiments to Inform Healthcare Decision Making, 26*(8), 661-677.

Macdonald, E. and Sharp, B. (2003), "Management perceptions of the importance of brand awareness as an indication of advertising effectiveness", Marketing Bulletin, Vol. 14, January, pp. 1-11.

MacGregor, G.A. (1998), "Salt: blood pressure, the kidney, and other harmful effects", Nephrology, Dialysis and Transplant, Vol. 13, p. 2471.

Maeve Brady, (2002) "Sodium High blood pressure and research needs", British Food Journal, Vol. 104 Issue: 2, pp.81-83, https://doi.org/10.1108/00070700210423617

McCarthy, J. 1981), Basic Marketing: A Managerial Approach, 7th ed., Richard D. Irwin, Homewood, IL.

McIlveen, H. (1994), "Product development and the consumer: the reality of the managing creativity", Nutrition & Food Science, Vol. 6, November/December, pp. 26-30.

Meadows, M. (2003). MSG: A common flavor enhancer. *FDA Consumer*, *37*(1), 34-35.

Mojduszka, E.M., Caswell, J.A. and Harris, M. (2001), "Consumer choice of food products and the implications for price competition and government policy", Agribusiness, Vol. 17 No. 1, pp. 81-85.

Mothersbaugh, D., Herrmann, R. and Warland, R. (2003), "Perceived time pressure and recommended dietary practices: the moderating effect of knowledge of nutrition", The Journal of Consumer Affairs, Vol. 27 No. 1, pp. 106-26.

Mowen, J.C. and Minor, M.S. (2001), Consumer Behavior: A Framework, Prentice-Hall, Englewood Cliffs, NJ.

NACNE Report 1983, *Proposals for nutritional guidelines tor health education in Britain.* Discussion paper: National Advisory Council for Nutritional Education.

Nelson Barber, Pei-Jou Kuo, Melissa Bishop, Raymond Goodman Jr, (2012) "Measuring psychographics to assess purchase intention and willingness to pay", Journal of Consumer Marketing, Vol. 29 Issue: 4, pp.280-292

Olney, J. (1969). Brain lesions, obesity, and other disturbances in mice treated with monosodium glutamate. Science, 164(3880), 719-721.

Olson, J.C. and Jacoby, J. (1972), "Cue utilization in the quality perception process", 3rd Annual Conference of the Association of Consumer Research, pp. 167-179.

Putrityas, T.F. (2016, June 24). Revealing consumer preference through product attribute and consumer lifestyle:. Economics. Retrieved from http://hdl.handle.net/2105/35444

Quester, P.G. and Smart, J. (1998), "The influence of consumption situation and product involvement over consumers' use of product attribute", Journal of Consumer Marketing, Vol. 15 No. 3, pp. 220-38.

Richard L. Divine, Lawrence Lepisto, (2005) "Analysis of the healthy lifestyle consumer", Journal of Consumer Marketing, Vol. 22 Issue: 5, pp.275-283

Roddy, G., Cowan, C. A., & Hutchinson, G. (1996) Consumer attitudes and behaviour to Organic foods in Ireland. *Journal of International Consumer Marketing*, **9** (2), 41-63.

Rolls, B.J., Ello-Martin, J.A. and Tohill, B.C. (2004), "What can intervention studies tell us about the relationship between fruit and vegetable consumption and weight management?", Nutrition Reviews, Vol. 62 No. 1, pp. 1-17.

Shiu, E., Dawson, J. and Marshall, D. (2004), "Segmenting the convenience and health trends in the British food market", British Food Journal, Vol. 106 Nos 2/3, p. 106.

Smith, W. 1956), "Product differentiation and market segmentation as alternative marketing strategies", Journal of Marketing, Vol. 21, pp. 3-8.

Solomon, M.R. (1986), "Deep-seated materialism: the case of Levi's 501 jeans", in Lutz, R. (Ed.), Advances in Consumer Research, Vol. 13, Association for Consumer Research, Las Vegas, NV, pp. 619-22.

The Statistics Portal. (n.d.). Retrieved from https://www.statista.com/outlook/40110200/120/potato-chips/indonesia?currency=usd#market-arpu

Van Birgelen, M., Semeijn, J. and Keicher, M. (2009), "Packaging and proenvironmental consumption behavior: investigating purchase and disposal decisions for beverages", Environment & Behavior, Vol. 41 No. 1, pp. 125-146.

Villani, K. and Wind, Y. (1975), "On the usage of 'modified' personality trait measures in consumer research", Journal of Consumer Research, Vol. 2, December, pp. 223-8.

Whitehead, T. (1998), “Against the grain”, The Grocer, Vol. 27, pp. 32-3, 35.

WHO (2014) Global Status Report on Noncommunicable Diseases 2014

Appendix 1:

Online Survey

Dear Respondent,
Thank you for agreeing to take part in this survey. My name is Wulandari, and this survey is for my bachelor thesis in Erasmus School of Economics at Erasmus University Rotterdam.

This survey is done to find out consumers' preference toward chips product consumption. It consists of basic demographic questions, several statements, and 10 choice sets. The survey should take you around five minutes. Be assured that your responses will only be used for academic research purposes and will be kept confidential. If you have any question, you can reach me through email at 481202wd@eur.nl

Once again, thank you for your participation
Best regards,
Wulandari

Demographic Questions
Please indicate your age……

Please indicate your gender

a. Male
b. Female

How many times do you buy chips product in a week?

a. Never
b. Once per week
c. A few times per week
d. Everyday
e. Multiple times per day

Agreeableness Statements
You will be given several statements regarding Health Consciousness and Concern toward Food Ingredients. You have to choose 1 out of 7 points scale for each statement. Please answer truthfully.

“I think of myself who is concerned about health issue”
“I reflect about my health a lot”
“I’m very self-conscious about my health”
“I’m alert to changes in my health”
“I’m usually aware of my health”
“I take responsibilities for the state of my health”
“I’m aware of the state of my health as I go through the day”

“I’m very concerned about the amount of MSG in food”
“I’m very concerned about the amount of salt in food”
“The quality of food product nowadays concerns me”

*Scales; 1: strongly disagree, 2: disagree, 3: somewhat disagree, 4: neither agree or disagree, 5: somewhat agree, 6: agree, 7: strongly agree

Choice Sets

In the following 10 questions, you will see possible combinations of product offerings. Varying in price (Rp. 18,000, Rp. 15,000, Rp. 12,000), chips main ingredients (potato or vegetables), level of MSG usage (high, low, none), level of salt usage (high, low, none), and packaging material (plastic or paper). In each question, you will be shown 2 options. Please indicate your preferred options for each question.

Question 1

Question 2

Question 3

Question 4

4	Rp. 18,000	Potato	High	None	Plastic
4	Rp. 15,000	Vegetables	Low	Low	Plastic

Question 5

5	Rp. 18,000	Vegetables	Low	None	Paper
5	Rp. 15,000	Potato	None	Low	Paper

Question 6

6	Rp. 18,000	Vegetables	None	High	Plastic
6	Rp. 15,000	Potato	Low	Low	Plastic

Question 7

7	Rp. 15,000	Potato	None	None	Plastic
7	Rp. 12,000	Potato	High	Low	Plastic

Question 8

8	Rp. 18,000	Potato	Low	Low	Paper
8	Rp. 15,000	Potato	High	High	Paper

Question 9

9	Rp. 18,000	Potato	Low	High	Paper
9	Rp. 15,000	Vegetables	High	None	Paper

Question 10

10	Rp. 18,000	Vegetables	Low	Low	Paper
10	Rp. 12,000	Vegetables	Low	High	Paper

Appendix 2:

Demographic Variables

Please indicate your gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	35	35.0	35.0	35.0
	Female	65	65.0	65.0	100.0
	Total	100	100.0	100.0	

Appendix A: Gender result generated by SPSS

Please indicate your age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18	6	6.0	6.0	6.0
	19	7	7.0	7.0	13.0
	20	20	20.0	20.0	33.0
	21	34	34.0	34.0	67.0
	22	6	6.0	6.0	73.0
	23	2	2.0	2.0	75.0
	24	3	3.0	3.0	78.0
	25	5	5.0	5.0	83.0
	26	5	5.0	5.0	88.0
	27	2	2.0	2.0	90.0
	32	2	2.0	2.0	92.0
	35	2	2.0	2.0	94.0
	37	1	1.0	1.0	95.0
	39	1	1.0	1.0	96.0
	40	4	4.0	4.0	100.0
	Total	100	100.0	100.0	

Appendix B: Age result generated by SPSS

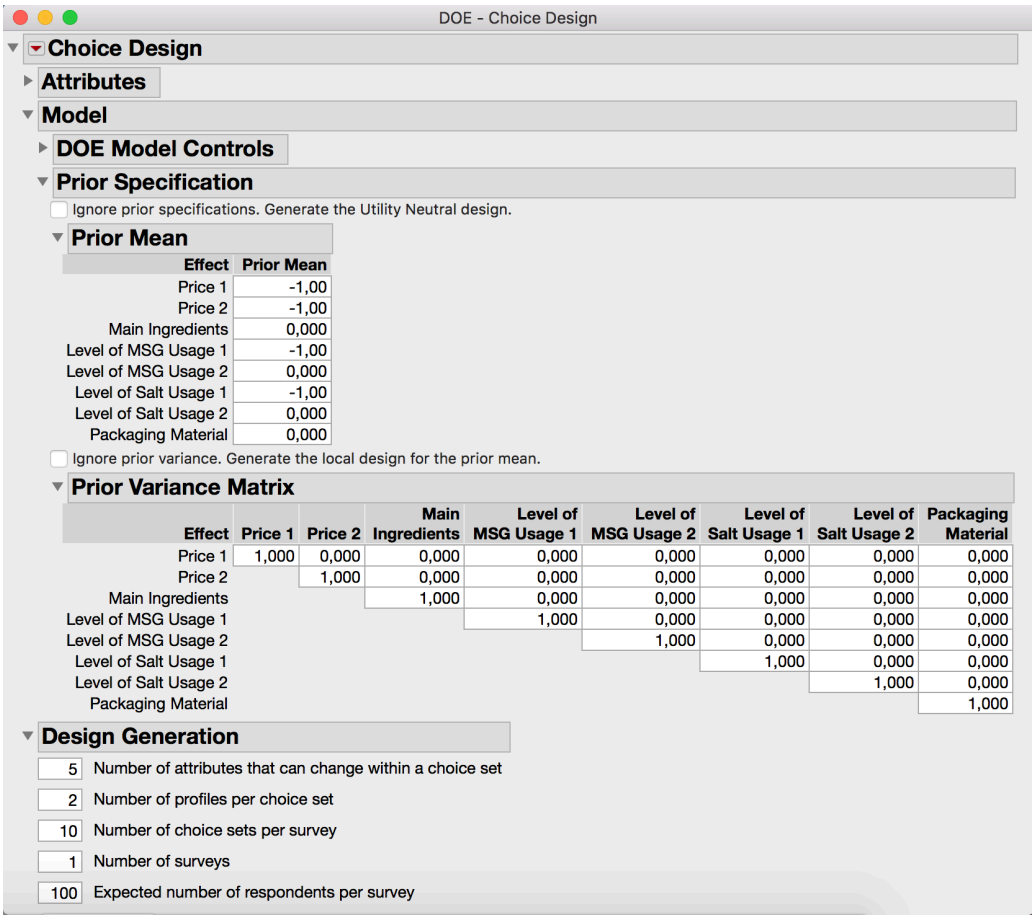
Appendix 3:

Research Design

Attributes

Name	Role	Attribute Levels		
Price	Categorical	Rp. 18,000	Rp. 15,000	Rp. 12,000
Main Ingredients	Categorical	Potato	Vegetables	
Level of MSG Usage	Categorical	High	Low	None
Level of Salt Usage	Categorical	High	Low	None
Packaging Material	Categorical	Plastic	Paper	

Appendix A: Choice Design Attribute



Appendix B: Choice Design Creation

Design

Choice Set	Price	Main Ingredients	Level of MSG Usage	Level of Salt Usage	Packaging Material
1	Rp. 15,000	Vegetables	Low	None	Paper
1	Rp. 18,000	Vegetables	High	None	Plastic
2	Rp. 18,000	Vegetables	Low	High	Paper
2	Rp. 15,000	Vegetables	Low	Low	Plastic
3	Rp. 18,000	Vegetables	High	Low	Paper
3	Rp. 15,000	Vegetables	Low	High	Plastic
4	Rp. 18,000	Potato	High	None	Plastic
4	Rp. 15,000	Vegetables	Low	Low	Plastic
5	Rp. 18,000	Vegetables	Low	None	Paper
5	Rp. 15,000	Potato	None	Low	Paper
6	Rp. 18,000	Vegetables	None	High	Plastic
6	Rp. 15,000	Potato	Low	Low	Plastic
7	Rp. 15,000	Potato	None	None	Plastic
7	Rp. 12,000	Potato	High	Low	Plastic
8	Rp. 18,000	Potato	Low	Low	Paper
8	Rp. 15,000	Potato	High	High	Paper
9	Rp. 18,000	Potato	Low	High	Paper
9	Rp. 15,000	Vegetables	High	None	Paper
10	Rp. 18,000	Vegetables	Low	Low	Paper
10	Rp. 12,000	Vegetables	Low	High	Paper

Appendix C: Choice Design generated by JMP

Choice Model

Effect Summary

Source	LogWorth	PValue
Level of MSG Usage	13,052	0,00000
Main Ingredients	7,632	0,00000
Level of Salt Usage	7,266	0,00000
Price	5,956	0,00000
Packaging Material	0,279	0,52581

Remove Add Profile Effect Add Subject Effect FDR

Parameter Estimates

Term	Estimate	Std Error
Price[Rp. 18,000]	-0,122893521	0,0779300501
Price[Rp. 15,000]	0,323020315	0,0912603002
Main Ingredients[Potato]	0,337567990	0,0616157099
Level of MSG Usage[High]	-0,476045149	0,0933637234
Level of MSG Usage[Low]	0,317963301	0,0674676981
Level of Salt Usage[High]	-0,330482483	0,0855776818
Level of Salt Usage[Low]	0,253639551	0,0557008982
Packaging Material[Plastic]	-0,042057032	0,0674616198

AICc	1174,0466
BIC	1213,1633
-2*LogLikelihood	1157,9013
-2*Firth LogLikelihood	1114,5487

Converged in Gradient

Firth Bias-Adjusted Estimates

Likelihood Ratio Tests

Source	L-R ChiSquare	DF	Prob>ChiSq
Price	27,430	2	<,0001*
Main Ingredients	31,195	1	<,0001*
Level of MSG Usage	60,108	2	<,0001*
Level of Salt Usage	33,461	2	<,0001*
Packaging Material	0,402	1	0,5258

Appendix D: Likelihood Ratio Test of basic model

Likelihood Ratio Tests

Source	L-R ChiSquare	DF	Prob>ChiSq
Price	0,000	2	1,0000
Main Ingredients	1,458	1	0,2272
Level of MSG Usage	0,227	2	0,8927
Level of Salt Usage	3,275	2	0,1944
Packaging Material	0,000	1	1,0000
Age*Price	1,409	2	0,4945
Age*Main Ingredients	0,000	1	1,0000
Age*Level of MSG Usage	0,952	2	0,6212
Age*Level of Salt Usage	3,371	2	0,1853
Age*Packaging Material	0,000	1	1,0000

Appendix E: Likelihood Ratio Test with Age included

Likelihood Ratio Tests

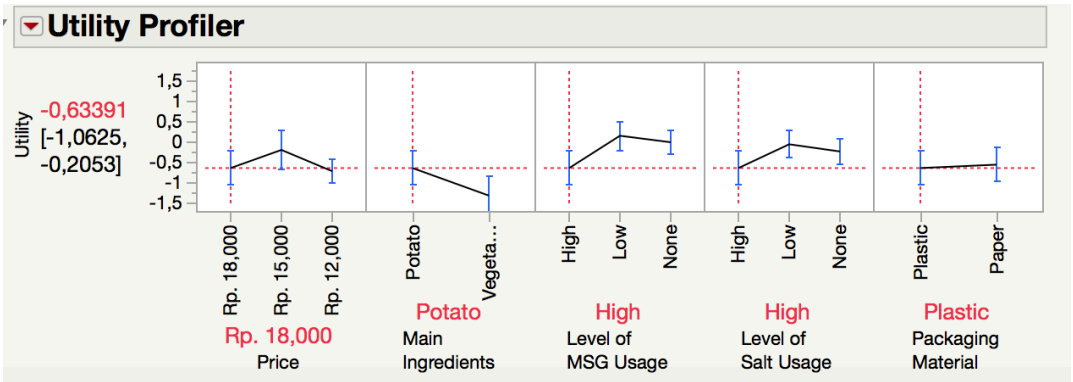
Source	L-R ChiSquare	DF	Prob>ChiSq
Price	28,008	2	<,0001*
Main Ingredients	31,770	1	<,0001*
Level of MSG Usage	52,799	2	<,0001*
Level of Salt Usage	24,719	2	<,0001*
Packaging Material	0,773	1	0,3793
Gender*Price	1,231	2	0,5403
Gender*Main Ingredients	0,858	1	0,3542
Gender*Level of MSG Usage	0,666	2	0,7169
Gender*Level of Salt Usage	5,667	2	0,0588
Gender*Packaging Material	1,112	1	0,2917

Appendix F: Likelihood Ratio Test with Gender included

Likelihood Ratio Tests

Source	L-R ChiSquare	DF	Prob>ChiSq
Price	0,000	2	1,0000
Main Ingredients	2,882	1	0,0896
Level of MSG Usage	0,000	2	1,0000
Level of Salt Usage	1,868	2	0,3931
Packaging Material	0,040	1	0,8408
HC*Price	22,742	48	0,9993
HC*Main Ingredients	24,191	24	0,4507
HC*Level of MSG Usage	34,234	48	0,9329
HC*Level of Salt Usage	40,398	48	0,7740
HC*Packaging Material	0,679	24	1,0000

Appendix G: Likelihood Ratio Test with Health Consciousness included



Appendix H: Utility Profiler