

Consumer Preference for Uraro Cookies: A Conjoint Analysis in Aid of Product Development

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Abstract— The paper inquires on the product attributes that influence or are likely to influence the consumption of uraro cookie, a delicacy made from the flour of arrowroot plant that abounds in the locale of the study. Its main purpose is to provide metrics that show the degree of importance consumers place on the pre-identified attributes of the product. More so, the study hypothesizes that different consumer groups have different preferences and vary significantly on the utility values of each attribute of the product. In the elicitation phase of the study, informants coming from a Business Research class were asked to give the attributes they are looking for in the product. Five attributes were identified, namely: flavor, texture, size, packaging and label. They were then asked to suggest options for each attribute. The final results showed three (3) options for flavor and two (2) each for texture, size, packaging and label. In the orthogonal planning phase using SPSS version 20 sixteen (16) card plans showing product designs and four (4) holdout cards were formed. In the study proper, 300 respondents coming from localities where uraro cookies are occasionally produced were asked to rank each card; 1 being the most preferred product design and so on. Conjoint analysis using SPSS version 20 points to flavor as being the most important having an importance value of 39.276, followed by texture (18.822), size (14.234), label (14.013) and packaging (13.655). Generally, the study shows that the most preferred design for uraro cookie is mocha, melts in the mouth, bite size, with nutrition facts in the plastic container. Results also show product design preference by market segments based on some demographic variables. Findings provide basis for market-informed product development and market segmentation toward making uraro cookies a One-Town One-Product item.

Keywords—Conjoint analysis, uraro cookies, orthogonal plans, market segmentation, utility values

I. INTRODUCTION

RESEARCH on consumer behavior is valuable in that it provides bases for product development as well as the development of marketing strategies for the general market and for the market segments (Dagupen, Januszewska, Tagarino & Viaene, 2004). Humans by nature are consumers. They consume goods or products, services, ideas and even activities. Salvatore (2008) states that consumers desire these items of consumption because of their “ability to satisfy human wants” (p. 58). Given the choices, consumers prefer one item to

others. Preferences refer to certain characteristics any consumer wants to have in a good or service and they are the main factors that influence consumer demand. While economists study preferences to perceive the demand for each commodity and the future implications it may cause (The Economic Times, n.d.), consumer psychologists study the attributes a product should have in order to make it an object of satisfaction. Product attributes play a very important role in marketing from the perspective of the marketer and consumer.

This study has the purpose of identifying the product attribute combinations that the participants prefer in uraro cookies. In addition, the study aims to obtain metrics that reflect the part-worth or utility score for each level of the attributes. Furthermore, it aims to identify preferred product design based on some classificatory variables.

II. METHOD

This study utilized conjoint analysis to measure the degree of relative importance the respondents give to each of the attributes and each option for every attribute of uraro cookies.

A. Participants and Procedure

A class in Business Research served as the participants during the Elicitation phase. The members of the class are familiar with the product being studied, they, at least, being residents of contiguous municipalities where uraro cookies are produced or sold. In a casual manner, the researcher asked the students what attributes of uraro cookies are important to them. The researcher asked another question on the plausible options for each of the attribute. Their responses provided the input for the software-mediated generation of orthogonal array of product attribute combinations.

In the data gathering proper, the 20 product designs were presented to a convenient sample of 300 participants (52.7% females, mean age = 38.47, SD = 14.99, 64% married) who have consumed or are at least familiar with the product. Most of the participants have at least a high school education (54%) and college degrees (16%). In the Index of Social Position, 82.6% are in the middle to lower middle brackets. They were asked to rank each profile according to their preference with rank 1 being the most preferred and so on. The participants were instructed not to miss any product profile in the ranking.

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B. Measures

Relative Importance of Product Attributes and Utility Scores for each Level of Attributes. The study used software generated orthogonal product designs based on the five attributes and their respective levels identified by the participants in the elicitation phase. The attributes and their respective levels are: flavor (caramel, chocolate, mocha), texture (melts in the mouth, crunchy and gritty), size (bite size, bigger than bite size), packaging (plastic bottle, cartoon boxes) and label (no nutrition facts, with nutrition facts). With the use of the fractional factorial design, the full profile approach of conjoint analysis reduced the 48 possible product profiles into 20, 16 of which are experimental while four (4) are hold outs. Participants were asked to rank each product design according to their preference with rank 1 as the most preferred.

C. Data Analysis

To generate the utility score (also known as part-worth) for each factor level, the researcher formulated a Conjoint Analysis command syntax since the Conjoint procedure is available only through the command syntax.

III. RESULTS

A. Overall Importance Values

The Conjoint analysis shows that for the participants, as anticipated, flavor is the most important attribute. This attribute has a relative importance of 39.276. This is followed by texture with a relative importance of 18.822, then by size (14.234), label (14.013) and lastly, packaging (13.655).

B. Overall Utility Score (Part-Worth) for Each Factor Level

For flavor, the participants indicate that mocha is preferred (utility = 1.945, s.e. = 0.847). For texture, the participants prefer that the product melts in the mouth (utility = 0.825, s.e. = 0.542). With reference to size, that bite size is preferred (utility = 0.203, s.e. = 0.542). Further, results point out that the participant prefer that the product has nutrition facts on the label (utility = 0.468, s.e. = 0.542). Finally, plastic bottle is preferred for packaging (utility = 0.108, s.e. = 0.542).

C. Importance Values of Product Attributes according to Classificatory Variables

Across all classificatory variables, flavor is the most important product attribute to the participants and the part-worth ranges from the lowest of 38.49 (for the young old adults) to the highest of 53.532 (for those who finished vocational courses). The second most important attribute is texture. Extreme variation in relative importance value is found within the same classificatory variable. Those belonging to the lowest ISP gave it a relative importance of 30.325 while those in the upper level gave it a part worth of 16.058. Nutrition facts as indicated in the label is the third most important attribute of the product. It received a relative importance of 23.358 from those who belong to the uppermost ISP and the lowest of 11.475 from the old old adult

participants. The fourth most important attribute is size. It got the highest relative importance value of 11.475 from the old old adults and the lowest of 4.620 from those in the middle ISP. The least important attribute is packaging. Its highest relative importance value is 10.219 (for those in the uppermost ISP) and the lowest of 0.855 (for those in the middlemost ISP).

D. Specific Utility Score (Part-Worth) for each Factor Level

Results of Conjoint Analysis show that mocha is the most preferred compared to chocolate and vanilla. Its utility score ranges from the lowest part-worth of 1.211 (lowest ISP participants) to the highest of 4.417 (older participants). The participants also indicate that they prefer that the product melt in the mouth. This texture level's utility score has the lowest of 0.686 in the case of those who belong to the upper middle ISP and the highest of 1.875 in the case of older participants. For size, bite size is preferred to bigger size. This attribute level has the lowest utility score of 0.125 (for both sexes) and the highest utility score of 0.875 (older participants).

Nutrition facts have a utility score which ranges from 0.404 (according to male and female participants) to 2.00 (according to those who belong to the highest ISP. Finally, the participants indicate that they prefer plastic bottle to cartoon box for packaging. Its utility score ranges from the lowest of 0.071 (according to sex) and the highest of 0.875 (for those approaching retirement age).

The test of significant differences in the utility scores of each preferred attribute level did not yield any significant results except in the case of preference for packaging according to civil status. The unmarried participants prefer cartoon boxes (utility = 0.09) while the married prefer plastic bottle (utility = 0.219). It shows that across all classificatory variables, the preferences for each level of the four (4) more important attributes is the same.

IV. DISCUSSION

A. Flavor

As expected, the study confirms many anecdotal accounts and studies which state that flavor is the primary attribute consumers prefer in any food product and has a larger impact on the consumer's decision to purchase (Vickers, 1993; Tatum, 2008). Among others, it is a factor critical to consumer acceptance and the success of many food products (Egan, Jarvis, Gibberd & Williams, 2007; Barrett, Beaulieu & Shewfelt, 2010; Ackbarali & Rohanie Maharaj, 2014) such as wine (Egan et al., 2007), meat (Clancy, 2006; Woerner, 2007; Curtis, Cowee, Lewis & Harris, 2008) and bread and pastry (Bakke & Vickers, 2011). Only a few studies indicate flavor to be of less importance in decision to purchase a product as in the case of canned coffee (Shih, Liu, Huang, Lin, Peng, 2008). Flavor is associated with eating experience. The more favorable the flavor is to the consumer, the more desirable is the eating experience (Tatum, 2008). Results also indicate that among the flavors, mocha has the highest utility. Search for

studies pointing to preference for mocha to caramel and chocolate as flavor proved futile. It can then be surmised that participants will not prefer chocolate flavor since the chocolate will conceal the visual qualities of the uraro cookies and caramel flavor may prove to be too sweet and irritating to the oral cavity and nasopharyngeal tract.

B. Texture

Secondary to flavor is texture as a preferred product attribute in uraro cookies. As the present study shows, the participants prefer uraro cookie to be melting in the mouth. This is supporting the observation that the textural properties of the product is becoming a megatrend (Sloan, 2013) in product development process. Studies show that individuals have particular behavior in manipulating food in their mouths and may belong to any of these four kinds: chewer, cruncher, sucker, smoocher (Jeltema, Beckley & Vahalik, 2015). With respect to uraro cookies, the participants are classified as smoochers; they derive satisfaction by manipulating the food between the tongue and the palate without using their teeth. Smooching the uraro cookie will verify this expected sensory quality and finding this quality leads to satisfaction.

C. Size

The participants indicate their preference for bite size to larger portions. Studies reveal that bite size or smaller portions provide similar feeling of satisfaction like the larger portions. However, smaller portions enhance appetite and provide stronger feeling of satiety. In addition, smaller portions led to a mean intake that was significantly lower than in the large portion condition (with a difference of 103 calories). By eating a considerably smaller portion, people will have eaten much less but will feel equally satisfied (van Kleef, Shimizu & Wansink, 2013). In addition, when eating is “on the go” and cleanliness is an issue (Brody, 2007), bite size uraro cookies reduce (if not totally eliminate) the mess resulting from morsels that fall off upon biting.

D. Label

Results of this study also suggest that the participants value the information about uraro cookies. This finding supports previous studies which found out that consumers nowadays are increasingly getting aware of the importance of information about food and food products (Rodríguez, Lupín & Lacaze, 2006; Enright, Good & Williams, 2010). Food labels containing nutrition facts gained prominence in the dietary advocacy of the Food and Drug Administration of the United States of America (Philipson, 2005).

E. Packaging

In the case of packaging, the participants (irrespective of their sex, age, educational attainment and occupation) prefer plastic canisters to cartoon boxes (which are eco-friendly) in packaging uraro cookies. This finding is closely associated with the properties of uraro cookies. Foremost among them is crunchiness. Uraro cookies are crunchy and this quality is better preserved in plastic canisters so long as they are air tight

and lid is kept closed unlike carton boxes that are easily damaged by water (or moisture) and heat. Plastic canisters are sturdier than cartoon boxes. This minimizes the cookies becoming pulverized. Additionally, clear plastic canisters are often preferred because it is easier to identify what is stored inside them without the need to open the lid (Goloviniova, 2014).

V. IMPLICATIONS

One important implication of the present study is the need for product developers to be market sensitive. The use of elicitation method helps and facilitates the identification of attributes and their respective levels and the numerous possible combinations of attributes can be reduced through a software mediated orthogonal planning. As the findings of the study show, conjoint analysis yields metrics that point to the degree of importance participants give to the attributes. Further, Conjoint analysis provides measures (part-worth or utility score) for each level of the attributes. Products developers will then be provided guidance in designing or improving their products. More so, they can be guided in the efficient allocation of resources pertinent to product development.

There have been movements in several countries aimed at reducing poverty by vitalizing rural economies through encouragement of local residents to identify local material, natural, or cultural resources and to devise methods to add value to them. One classic example, and being the original, is the One Village One Product (OVOP) movement which was started in the Oita Prefecture of Japan in the 1970s. The original concept of OVOP was to encourage villages in Oita each to select a product distinctive to the region and to develop it up to nationally and globally accepted standards. OVOP proved to provide communities with the chance to market local output and to create employment opportunities (Natsuda, Igusa, Wiboonpongse, Cheamuangpahn, Shingkarat & Thoburn, 2011). The success story of OVOP led to its replication in several areas such as Thailand in Asia (Natsuda et al., 2011) and in several countries in African and Latin American continents (Matsui and Yamagami 2006; Wahlin and Natsuda 2008; Kurokawa et al. 2010).

Lately, the Philippines adopted OVOP under a different name, One Town One Product (OTOP) through its Department of Trade and Industry (DTI). Just like the OVOP, OTOP encourages the growth of micro, small, and medium enterprises (MSMEs) in the countryside through the development of indigenous raw materials, and local skills and talents. Through OTOP, local chief executives take the lead in the identification, development, and promotion of a specific product or service over which a particular Philippine town has a competitive advantage (DTI, n.d). As shown in this study, market-informed product designing through conjoint analysis as applied to uraro cookies will help foster product or service competitiveness.

On the more practical side, eco-friendly principles or practices maybe incorporated in the product design especially

in packaging. As the study shows, the participants are divided in terms of part-worth or utility scores for the levels of packaging. Limitations of the Study and Implications for Future Research

One limitation of the study is the sampling technique. The participants were conveniently selected, hence, the findings can not be generalized outside the sample of this study. Another limitation of the study is that it did not have price as an attribute. It did not include how much the participant are willing to pay for a given unit of the product. The conversion of preference to actual consumption is, in the principles of economics, influenced by price. Nevertheless, the study illustrates that consumers attach relative importance to product attributes which can be quantified.

Future research can include greater number of participants who should be selected at random using certain criteria, one of which is familiarity with the product at the very least. In the conduct of segmentation, the recommended sample size based on the number of segment should be observed. Furthermore, future research should consider variables such as willingness to pay, future intention to consume, beliefs and attitudes towards the product as well as conditions that either facilitate or constrain consumption.

On the practical side, product design prototyping should be initiated and a well- designed hedonic test be conducted to a consumer sensory panel coming from a broad spectrum of the population in order to validate the preferred product design obtained in this study. Findings will provide valuable inputs to further product improvement with the view of enhancing product consumption and expanding market opportunity.

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