



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

Consumers' Stated Choices versus Purchasing Desires: Case of Hawaii¹ Food Baskets

Wuyang Hu and Linda J. Cox*

Abstract

This article uses a case study involving Hawaii food baskets to show that although a choice based conjoint experiment can elicit respondents' most preferred alternative, this "preferred" option may not be one that respondents are willing to purchase. Thus, a choice based experiment that involves hypothetical product selection may predict different behavior, depending on the type of questions asked in the survey. This study shows that follow-up questions in a conjoint survey may serve an important role in improving model fit and the comprehensiveness of behavioral prediction.

Keywords: *Gift baskets in China, preferred choice, willing to purchase, hypothetical selection*

JEL Classification: Q13, D12

Introduction

In the study of human behavior, observations are drawn either from action taken as a result of an actual event or from responses to a hypothetical environment. Economists often model individual decision-making based on preferences corresponding to actual or hypothetical actions (Adamowicz, Louviere and Williams 1994). The revealed preference approach can be used to examine individuals' choice behavior or relevant welfare implications, but in the case of non-market goods or goods not yet available on the market, the data collection and analysis needed to determine the revealed preferences may not be cost effective. On these occasions, the stated preference approach has been applied. The stated preference approach in various forms has been seen in research involving transportation, environmental products, health, and many other emerging areas including food products. In welfare elicitation, either contingent valuation or a choice experiment is often used (Mitchell and Carson 1989); for valuation, a willingness to accept or a willingness to pay question may be adopted; and for investigating hypothetical action, a preference question or an intent to purchase question may be asked.

¹ The word Hawaiian is not used in this paper because it implies that the producer of the food item is of native Hawaiian ancestry.

* Wuyang Hu, Ph.D: Assistant Professor, Department of Agricultural Economics, University of Kentucky, Lexington, Kentucky 40546-0205
Office: (859) 257-7271, FAX: (859) 257-7290, E-mail: wuyang.hu@uky.edu
Linda J. Cox, Ph.D: Community Economic Development Specialist, Department of Natural Resources and Environmental Management, University of Hawaii at Manoa 1920 Edmonson Road, FT 62, Honolulu, HI 96822-2279
Office: (808)956-7602, FAX: (808)956-6539, E-mail: lcox@hawaii.edu

The validity of the stated preference approach has been widely debated and accounts for a significant portion of the current literature. The major criticism associated with the stated preference approach is its foundation in hypothetical scenarios. The behavior reflected in a stated preference approach may not be consistent with actual behavior (Bishop and Heberlein 1990) nor be context free (Kahneman and Tversky 2000). As a result, a body of literature attempts to address these issues and offer methodologies to reduce these problems (e.g., Cummings and Taylor 1999). This article extends the knowledge base further by examining whether the prediction of consumers' choices and welfare measures associated with choosing food items is affected by the preference questions asked in a hypothetical situation and if so, whether there are ways one can reduce this impact. This result may have important ramifications for food marketing research and to other types of work using hypothetical approaches.

Given the current popularity of choice based on experiments in the literature, particularly in the study of agricultural products (e.g., Lusk et al. 2003, Hu et al. 2005), this approach is used here to examine the willingness of Chinese respondents to pay for various attributes associated with Hawaiian food baskets. A brief justification for the research follows.

As the overall economy and urban residents' disposable income continue to grow, China has an increasing market for luxury goods including food products from the United States (Embassy of PRC 2005). The full involvement of China in the WTO in 2001 intensified interest among potential trading partners, while the sheer size of the Chinese market generates interest in relevant marketing research. Hawaii is one of the world's most recognized producers of tropical agricultural products and given its geographic proximity to Asia, products from Hawaii may have potential in China.

In the past, individual Hawaii producers have not exported a significant portion of their output because the production volumes are not sufficient to realize the economies of scale needed to support such a significant export effort. With the state's new agricultural initiatives, not only is environmentally and culturally viable production being recommended, but appropriate marketing strategies that add value have become a focal point (Hashimoto 2002). An idea rooted in the growing interest to identify new marketing options is that local producers "bundle" their products and promote them as Hawaii food baskets. This would allow the food products to be used subject to their availability, encourage joint marketing among producers, and allow a unique product to be merchandized, rather than relying on commodity marketing. In addition to the basket's contents, the basket itself may be associated with the unique environment and culture of Hawaii in order to attract buyers. Research has just begun to determine how this concept could be operationalized and the case study that includes a conjoint experiment forms the basis of this paper as the first step in this effort. Therefore, this paper provides an alternative application of stated preference research and brings practical results to relevant stakeholders associated with the marketing effort.

The next section of this paper discusses the data used in this study and the methodology used to improve purchase predictions, based on the conjoint experiment. The empirical models used in this analysis are discussed in the succeeding section, followed by an explanation of the survey respondents' choices, the implied welfare measures, and the effectiveness of the correction approach. The final section summarizes the results and offers conclusions based on this study.

Methodology

Data used in this study is from a survey containing a conjoint experiment designed to elicit Chinese respondents' preferences for Hawaii food baskets. One unique feature of the experiment is the use of follow-up questions to supplement the information obtained from the respondents' responses to the conjoint experiment. Normally, initial focus group discussions are conducted to identify the factors that influence consumers' decision making. Since the focus of this study is on the market potential of food baskets rather than an individual food items, the consumer responses to various features of the baskets are of greater interest and therefore, the food items in each basket did not vary. Based on input from focus groups, producers and marketing specialists, the food items in each basket included: macadamia nut rum cake, lightly salted macadamia nuts, curried macadamia nuts, honey roasted macadamia nuts, raw sugar for sweetening beverages, macadamia nut oil for cooking, macadamia nut oil infused with chilies for cooking, macadamia nut candy, Kona coffee, passion fruit, pineapple and mango tea bags, whole leaf tropical tea, chocolate covered coffee beans, pure vanilla extract for baking, vanilla beans for baking, organic white honey, tropical fruit butter and guava jam.

The food items are considered to be high quality, exotic tropical products and a price premium is expected, which contributes to the promotional strategy of grouping them in a unique container as a gift basket. This idea is also consistent with previous observations that consumers in Asian markets favor gifts of high quality or with novelty features and are willing to pay a higher price for such products (China Daily 2005). The attributes in the conjoint experiment included: the product's place of origin, the type of container, and the price of the basket. The baskets and their contents may be described as produced in Hawaii. Previous research has found that Hawaii products may enjoy a price premium due to the State's lush tropical environment and unique culture (Cox et al., 1995).

The three different types of containers included a koa bowl, a protea bowl, and a bamboo basket. To ensure that the survey respondents were aware of each container's characteristics, explicit explanations were provided for each type of container, along with a list of the contents. The koa bowls were handcrafted by an artist on the island of Hawaii from koa; a wood of cultural, economic and ecological significance in the islands. The protea bowls were handmade by an artist on the island of Maui and fabricated from the protea plants available in Hawaii. The bamboo basket was not described in the same detail as the previous other two types of containers because hand crafted bamboo baskets are common in China. The same food items were packaged into each container and a photo was taken of each of the three gift baskets. If a container was labeled "made in Hawaii" with the State's official label, survey respondents were asked to assume that the container and all of the contents were grown, harvested, and processed in Hawaii. On the other hand, if the basket was not labeled as made in Hawaii, then respondents were asked to assume that neither the contents nor the container itself were produced in Hawaii.

The third attribute considered was price. Three levels were used in the analysis: RMB800, RMB1200 and RMB2800, and at the time of research, USD1 = RMB8.27. While these prices may appear high, they were based on the actual cost of producing the handcrafted containers and the food products with a reasonable profit margin. The strategy used to market the gift basket capitalizes on the exotic image of Hawaii and at-

tempts to elevate the food products to the same level as the container, which is regarded as a one-of-a kind work of art. This strategy is consistent with the high price levels of the baskets since they are considered to be luxury goods, which means that consumers will be less responsive to price levels than they normally would be to the price levels of food items. The three attributes, origin, type of container, and price were then incorporated into a fractional factorial design considering main and first-order interaction effects to generate a total of 12 combinations.

The survey contained three sections: a brief introduction, a general set of questions on the respondent's socio-economic status and gift purchasing habits, and the choice experiment. After pre-testing, the survey was fielded at the 3rd International Food, Drink, Supermarket, Hotel, Restaurant and Foodservice Exhibition in Guangzhou, China during June 23rd to 25th 2004. In recent years, China has hosted several similar exhibitions in major cities like Beijing, Shanghai and Guangzhou. These exhibitions typically attract attendees from around the world to showcase their products, and a large number of potential consumers in the general public, as well as business people with specialized knowledge of the local markets. Therefore, a survey fielded at this type of venue collects responses from individuals who have a relatively good understanding of food characteristics, food consumption trends, and an interest in innovative new products.

A "Hawaii booth" was set up in the exhibition with displays of various Hawaiian food products together with the three gift baskets pictured in the conjoint experiment. Chinese graduate students were hired and trained to administer the survey and two faculty members from the University of Hawaii were also present to oversee the process. Survey participants were recruited on site from those attending the exhibition. A brief overview of the survey was provided to determine if the individual was willing to participate in the survey. The 12 hypothetical food baskets were presented as separate cards with each card showing a picture of the basket and a list of its characteristics. Respondents were asked to "choose the basket that you prefer the most" out of the randomly shuffled deck of cards.¹ After selecting their most preferred alternative, respondents were asked to complete a set of follow-up questions to provide further information on their preferences. The follow-up questions were used to supplement the conventional conjoint experiment and recently have researchers noticed the importance of follow-up questions.

Cairns and van der Pol (2004) and Ready (2006) demonstrated the potential of follow-up questions to further calibrate or increase the predictive capacity of stated choice models. The conjoint experiment described here is designed to elicit individuals' most preferred option among a set of statistically constructed and pre-defined alternatives. The problem is that the "most preferred" option may not be one that the respondents would actually purchase. Fundamentally, the most preferred product is not independent from the context in which it is presented. In the extreme situation, if all individuals' conditional "most preferred" options are not attractive enough to result in a purchase, then sales may not occur when these products reach the marketplace with no profit.

The follow-up questions in this study queried respondents about their intent to purchase. Specifically, after the respondent selected their most preferred option, each was asked if they would like to actually buy this product if it was on the market. If the answer was "yes", then respondent preferred this option to the 11 alternatives and would

buy it. If, on the other hand, the answer was “no”, a discrepancy exists between the most preferred option and the intent to purchase. In this case, the respondent was asked “how much cheaper would the product have to be before you would consider buying it”. Respondents then offered a price that was acceptable to them.² These follow-up questions provide more information about respondents’ preferences and they may also serve as a tool to assess the properties of the conjoint experiment. If the discrepancy between the conditional choice and the unconditional purchase decisions are large, then attempts to interpret results obtained from one method as applicable to another type of behavior might be questionable. More importantly, if the answers to the hypothetical questions are not invariant in terms of the behavior underlined, the suggested welfare measures may differ greatly as well. This issue is discussed in more detail in the empirical analysis section of this paper.

A total of 156 questionnaires were usable, after eight respondents were eliminated because they did not complete the choice questions. Table 1 gives the descriptive statistics of some demographic characteristics of the remaining sample. The sample favors relatively young, male consumers with slightly more education than average and urban consumers. These sample characteristics cannot be directly compared to the national average in China or other studies that focus on regular staple foods. The Hawaii food baskets will be marketed as exotic gifts and are most likely to be purchased by adventurous consumers who are relatively young, live in major urban areas and are well educated.

Table 1. Descriptive Statistics of Demographic/Socioeconomic Variables

<i>Variable</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Description</i>
Male	0.667	0.472	Dummy variable for being a male consumer
Age	27.538	5.582	Continuous consumers' age
Education	10.987	0.847	Continuous consumers' education level
Urban N=156	0.885	0.320	Dummy variable for being an urban resident

Theoretical Model

The analysis in this study is based on random utility maximization. Suppose \mathbf{X}_{ni} is a vector of the attributes associated with the i th basket for individual n , then the utility (U_{ni}) of individual n choosing the i th basket from the total 12 baskets offered in the experiment is:

$$U_{ni} = \mathbf{X}_{ni}\boldsymbol{\beta} + e_{ni} \quad (1)$$

where $\boldsymbol{\beta}$ is a vector of parameters to be estimated and e_{ni} is the error term. If e_{ni} is assumed to be iid Gumbel distributed, the choice probability of option i suggested in (1) can be expressed in a conditional logit (CL) form:

$$P_{ni} = \frac{\exp(\mathbf{X}_{ni}\boldsymbol{\beta})}{\sum_{j=1}^{12} \exp(\mathbf{X}_{nj}\boldsymbol{\beta})} \quad (2)$$

Since the follow-up questions asked the respondent whether they would like to purchase their most preferred choice, a binary choice model is adopted and the dependent variable is a yes/no answer. Given the attributes of each individual's most preferred option \mathbf{X}_n , the indirect utility can be defined as:

$$U_{nk} = \mathbf{X}_n \boldsymbol{\beta} + e_{nk} \quad k = 0, 1 \quad (3)$$

Assuming a similar distribution of the error term, the associated probability of purchasing the preferred option can be written in a binary logit (BL) form:

$$P_n(k=1) = \frac{\exp(\mathbf{X}_n \boldsymbol{\beta})}{1 + \sum \exp(\mathbf{X}_n \boldsymbol{\beta})} \quad (4)$$

Estimation Results and Welfare Measures

Before presenting the estimation results of the choice models, the difference between the "most preferred" option and the "willing to purchase" option is examined using a simple analysis of the raw data. As indicated in Table 2, 59 respondents of the 156 individuals in the sample, almost 38 percent, indicated that they would not purchase their preferred alternative. When they were asked to provide a price at which they would consider buying the product, the overall average was about RMB979. For those individuals who would purchase their preferred alternative, the average price of these products was about RMB1472. Based on these preliminary results, the follow-up questions reveal a considerable shift of behavior from the original question. Therefore, the two types of questions generated noticeably different results.

Table 2. Differences Revealed by Conjoint Choice and Follow-up Questions

	<i>Absolute Number</i>	<i>Percentage</i>
Individuals do not wish to purchase chosen products	59	37.8%
	<i>Mean</i>	<i>SD</i>
price of purchased alternatives	1472.165	912.151
price of not purchased alternatives	979.475	575.888

Table 3 presents the estimation results for models utilizing different information from the survey. The first model is a conditional logit model based on the attributes used in the conjoint experiment. Only two alternative specific constants (ASC), *CONSTANT1* and *CONSTANT2*, were included in the model, although theoretically more ASCs could have been incorporated into the model. All 12 products offered to respondents in the choice experiment were generic options since they do not differ from each other in any way other than by the associated attributes. Unlike ASCs representing specifically labeled alternatives, these constants do not have any interpretation other than to assist in model identification. Only the actual attribute variables are interpreted here. In addition, if more ASCs are included into the analysis, the model has a difficult converging. The attribute coefficient estimates are robust across different constant specifications, thus, two ASCs, those associated with product 7 and 9, were selected.

Table 3. Estimation Results

Variable	CL based on attributes		BL based on attributes		CL conditional on purchasing		CL based on adjusted price		CL based on adjusted price and demographic information	
	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.
Constant1	-0.927	0.567	-0.821	1.167	-2.196**	1.047	-1.222**	0.568	-1.339**	0.568
Constant2	0.510	0.493	0.683	0.969	0.363	0.702	1.702***	0.530	1.603***	0.530
KOA	0.807***	0.199	0.680	0.422	1.035***	0.252	1.081***	0.201	8.235**	3.996
PROTEA	-0.187	0.233	0.934*	0.498	-0.060	0.291	0.097	0.234	-7.321*	4.346
HAWAII	0.714***	0.265	0.569	0.361	0.428	0.310	0.681**	0.266	-11.513***	4.169
PRICE	-0.439***	0.115	-0.347	0.213	-0.730***	0.163	-1.225***	0.166	-1.230***	0.168
KOAD									-64.391*	35.9732
PROTEAD									66.487*	38.736
HAWAIID									110.185***	37.591
LL	-351.266		-101.513		-208.000		-317.185		-309.088	
Adj. R ²	0.094		0.061		0.137		0.182		0.203	
N	156		156		97		156		156	

Variables *KOA*, *PROTEA*, *HAWAII* are all dummy variables representing the basket container type or the place of origin. Dummy variable *BAMBOO* was omitted from the estimation and *PRICE* is a continuous variable. The model does not fit the data well with an adjusted ρ^2 approximately 0.09. Compared with bamboo basket, a koa bowl is significantly more attractive to Chinese consumers, although the protea bowl does not generate any extra value to consumers in addition to a bamboo basket. The variable *HAWAII* is significantly positive indicating that survey respondents, on average, attach a sizeable value to a basket if they know that the containers and its contents were produced in Hawaii. This result is consistent with previous research on Hawaii grown products (Cox, et al. 1995) and other studies concluding that origin labels may significantly increase consumers' willingness to pay for products (Loureiro and Umberber 2003). Finally, the price variable has a negative and significant coefficient as expected.

Since the follow-up questions also asked individuals whether they would like to purchase their preferred product from the 12 alternatives, a binary logit model was used to analyze the respondents' intent to purchase. As the results in Table 3 indicate, the BL model has a worse overall fit than the multinomial choice model and the variables are border-line, at best, in significance. While a binary choice model usually provides less information on behavior than a multinomial choice model (which partially explains the poor fit of the BL model), the third model in Table 3 shows the power of combining the conjoint experiment and the follow-up questions. In this model, responses from those individuals who indicated that they would not consider buying the product they identified previously as their most favored product among the 12 offered products are dropped from the analysis, which reduces the sample size from 156 to 97. Nevertheless, even with this smaller sample size, the overall model fit as indicated by the adjusted ρ^2 stat, increases to 0.137. The price variable has become distinctly more significant while the variable *HAWAII* became insignificant. Interpretation of the model's estimated coef-

ficients is abbreviated because the purpose of this paper is to investigate how the information obtained in the follow-up questions may qualitatively improve help the overall performance of the model. This may be viewed as respondents being approached twice for information about their preferences with a conditional choice question and an unconditional purchase question. The additional information provided by these two sets of preference data produced a model that is better able to predict the behavior of respondents.

The largest drawback of the above model is that it reduces the sample size by 37 percent and therefore disregards a substantial amount of information. The fourth model in Table 3 is based on a procedure that prevents this loss of information by taking advantage of the price query included in the follow-up questions. Since each respondent who refused to purchase the product they preferred was asked to specify the price they would pay for their preferred alternative, this price could then replace the price of their preferred alternative. On the other hand, the price of the preferred alternative for respondents who indicated they would indeed purchase it remains unchanged. This approach does not require that the sample be modified to incorporate buyers only and therefore does not reduce the sample size. As indicated in Table 3, this CL approach improves the model fit as compared to the model with the reduced sample size. Both *PRICE* and *KOA* are drastically more significant than in the model using unadjusted prices. The significance of the variable *HAWAII* dropped slightly but is still significant at the five percent level. This result further supports the notion that different questions asked in a hypothetical survey may generate different predictions. However, the information collected from different types of questions need not to be seen as contradictory, and if combined, may offer a better prediction of consumer behavior rather than using either type of question separately.

The last model presented in Table 3 explores the possibility whether the prediction of consumer behavior can be further improved by incorporating individual-specific information into the analysis. Demographic/socioeconomic variables that were included in the survey are used for this purpose. Several variables such as respondents' age, gender, and income levels were initially included along with the attribute variables of the baskets but they did not appear to have any significant impact on preferences. Respondents' education level however was found to be an important factor and the results are shown in Table 3. All attribute variables, except for the adjusted *PRICE* variable, are interacted with respondents' education level. *PRICE* is excluded to maintain the coefficient of the price in a simple linear form, which is convenient for welfare calculations. A simple likelihood ratio test indicates that the model fit has once again been significantly improved and according to Domencich and McFadden (1975), a $0.2 \rho^2$ stat in a choice model like this can be viewed as very beneficial. In this model, coefficients of *KOA* and *PRICE* are still strongly positive and negative, respectively. Coefficients of *PROTEA* and *HAWAII* are both negative, although *PROTEA* is only marginally significant. These appear to be contradictory with the result reflected in the CL models reported earlier. However, the education-interacted attribute variables are also marginally significant. This indicates that the education level of respondents affects the evaluation of the attributes and this is analyzed in Table 4 where the marginal values of attributes are reported.

Table 4. Marginal Values of CL Model Based on Conjoint Experiment Only and Incorporating Follow-up Question Information

	<i>CL model based on conjoint experiment only</i>			
	<i>Lower 95%</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Upper 95%</i>
KOA	1901.493	2024.188	4426.460	2146.883
PROTEA	-621.072	-535.486	3087.660	-449.901
HAWAII	1700.534	1827.986	4598.062	1955.438
	<i>CL combining follow-up question information</i>			
	<i>Edu = 9 years</i>			
	<i>Lower 95%</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Upper 95%</i>
KOA	1988.693	2008.018	697.204	2027.344
PROTEA	-1127.840	-1106.797	759.168	-1085.754
HAWAII	-1337.144	-1317.381	712.990	-1297.618
	<i>Edu = 11 years</i>			
		<i>Lower 95%</i>	<i>Mean</i>	<i>Std. Dev.</i>
KOA	943.700	948.894	187.373	954.088
PROTEA	-21.090	-15.298	208.954	-9.506
HAWAII	503.971	510.817	246.992	517.663
	<i>Edu = 13 years</i>			
		<i>Lower 95%</i>	<i>Mean</i>	<i>Std. Dev.</i>
KOA	-121.059	-104.293	604.881	-87.526
PROTEA	1082.497	1099.884	627.241	1117.270
HAWAII	2297.195	2317.477	731.708	2337.759

The marginal values are calculated by total differentiation of the indirect utility function with respect to all attribute variables, including the price, holding the estimated coefficients constant. This suggests that the marginal value for each attribute is the ratio between the coefficient associated with that attribute and the coefficient of price. Standard deviations and the associated upper and lower bounds of these marginal values are calculated by simulating using the covariance matrix of the estimated coefficients 5000 times as described by Hu et al. (2005). The first panel in Table 4 shows the marginal values implied by the CL model using only information from the conjoint experiment. The koa bowl, as compared to a bamboo basket, and a Hawaii grown label are associated with large positive values suggesting that holding everything else constant, Chinese consumers are willing to pay RMB2024 for a koa bowl and RMB1827 for certified Hawaii products. Although *PROTEA* was not found to be significant in the model, its marginal values are presented only for comparison purpose.

The marginal values implied by the above model contrasts sharply from those that are suggested by the model that considers information from the follow-up questions. The rest of Table 4 reports marginal values based on the last model specified in Table 3 assuming different levels of respondents' education. For individuals with a junior high

school level of education (nine years), the value of a koa bowl is similar to the previous model result. However, the value of protea basket when compared with a bamboo basket is lower and the notion of Hawaii grown does not appear to be appealing to these respondents at all since its marginal value is negative. For respondents with higher education, i.e., 11 years, the sample average, a koa bowl becomes relatively less attractive and the Hawaii grown label is regarded with some positive value. The value of a protea basket does not differ greatly from a bamboo basket. When respondents have some college education, i.e., 13 years, their marginal values change greatly from individuals who had less education. To these respondents, a koa bowl does not appear to be more attractive than a bamboo basket, but a protea basket is valued significantly more. These respondents also embraced the idea of Hawaii products warmly with marginal value associated with a Hawaii grown label as high as RMB2317.

If the CL model that uses only the information from the conjoint experiment is viewed as reflecting the marginal values associated with an average consumer, it can be compared to the above CL model evaluated at the average education of respondents of 11 years. The marginal values calculated from these models are considerably different. This indicates that market or policy analysis that uses welfare measures as a major tool could differ based on how the hypothetical survey is constructed. In this study, asking a conditional choice question and an unconditional purchase question may reveal different behavior and subsequently affect the implied welfare measures. Since the conjoint based model that incorporates the follow-up questions and demographic/socioeconomic information outperforms the models based on using either only the conjoint experiment or the binary follow-up answers, a combined approach appears to be preferred and may be more reliable in terms of revealing consumers' preference.

Conclusion

Using results from a survey that contains a conjoint choice experiment to examine Chinese consumers' preference for food baskets, this study examines whether a difference exists between respondents' "most preferred" option in a conjoint experiment and their actual purchasing intentions and if a gap exists, whether these two sources of information can be combined and how the empirical analysis may benefit from this process. The result presented here indicates that individuals may identify their most favored option, but this conditional choice may not be attractive enough for them to purchase this product. The introduction of follow-up questions into the survey design allows researchers to determine the marketability of the preferred option.

Since the results analyzed in this paper are hypothetical in nature, the results of this study suggest that different elicitation questions may result in different predictions of behavior. This is a not a trivial concern as many market or policy analysis are based on such hypothetical surveys. When interpreting the result of a conjoint experiment, one should be aware of its hypothetical nature and keep in mind that the results may not be context-free. Based on the results presented here, follow-up questions can reveal more information about actual consumer behavior and improve the analysis of the conjoint experiment. The results suggest that proper survey design can increase the prediction's precision. Specifically, the study shows that the responses from different types of questions need not be contradictory or irrelevant to each other and if combined, may offer a

better prediction of consumer behavior than using either approach separately.

Finally, this study has important implications to food marketers in China and in Hawaii. The survey results presented here indicate that Chinese respondents appear to be willing to purchase food baskets as gifts. Different characteristics of the baskets are valued differently by survey respondents and vary across individuals with different level of education experience. The knowledge that the Hawaii product including the food items and the containers might be marketed at a premium in China is promising for local Hawaii producers. A detailed benefit-cost analysis is likely needed for Hawaii producers to assess how much profit these products may generate.

Notes

- ¹ Respondents were also asked to rank the cards according to their preferences. Since the focus of this article is on methods to improve conjoint experiments, the investigation of respondents' rank-ordered preference is left to a separate study.
- ² This type of follow-up questions is referred as "single bounded". An alternative way to construct these questions will be to also ask those respondents who would like to purchase their most preferred option a question like "how much more would you pay for this product". This will constitute a "double bounded" follow-up question. This approach may also generate some interesting results and is a venue for further research.

Acknowledgements

This research was partially funded by a grant from the Center for International Business Education and Research at the University of Hawaii at Manoa and an Emerging Market grant from the USDA Foreign Agricultural Service to the Hawaii Agricultural Research Center. The authors would also like to acknowledge the assistance of Quincy Edwards, Catherine Chan-Halbrendt, Susan Schenck, JoAnn Johnston, Stephanie Whalen, Min Meng, and Carol Bishop.

References

- Adamowicz, W., J. Louviere and M. Williams (1994) "Combining Revealed and Stated Preference Methods for Valuing Environmental Amenities" *Journal of Environmental Economics and Management* 26: 271-292.
- Bishop, R. C. and T. A. Heberlein (1990) "The Contingent Valuation Method" in *Economic Valuation of Natural Resources*, R. J. Johnson and G. V. Johnson eds., Boulder, CO: Westview Press, 82-104.
- Cairns, J. and M. van der Pol (2004) "Repeated Follow-up as a Method for Reducing Non-trading Behavior in Discrete Choice Experiments" *Social Science and Medicine* 58: 2211-2218.
- China Daily (2005) "China to be Top Luxury Goods Consumer" December 12, 2005, intercepted online on July 10, 2006 at http://www.chinadaily.com.cn/english/doc/2005-12/12/content_502708.htm

- Cox, L. J., M. Fox and R. Bowen (1995) "Does Tourism Destroy Agriculture?" *Annals of Tourism* 22: 210-213.
- Cummings, R. G. and L. O. Taylor (1999) "Unbiased Value Estimates for Environmental Goods: A Cheap Talk Design for the Contingent Valuation Method" *American Economic Review* 89:3: 649-665.
- Domencich, T. and D. McFadden (1975) *Urban Travel Demand: A Behavioral Approach*, Amsterdam: North-Holland.
- Embassy of the People's Republic of China in the United States of America (2005) "China Expected to be 2nd Biggest Luxury Goods Consumer" September 15, 2005, intercepted online on July 13, 2006 at <http://www.china-embassy.org/eng/xw/t212248.htm>
- Kahneman, D. and A. Tversky (2000) *Choices, Values, and Frames*. Cambridge: Cambridge University Press.
- Hasimoto, A. G. (2002) "Hawaii's Agriculture Industry: Planting Seeds for a Revitalized Economy" Web Article, College of Tropical Agriculture and Human Resource, University of Hawaii at Manoa, Honolulu, HI.
- Hu, W., M. M. Veeman and W. L. Adamowicz (2005) "Labeling Genetically Modified Food: Heterogeneous Consumer Preferences and the Value of Information" *Canadian Journal of Agricultural Economics* 53: 83-102.
- Loureiro, M. L. and W. Umberger (2003) "Estimating Consumer Willingness-to-Pay for Country-of-Origin Labeling" *Journal of Agricultural and Resource Economics* 28: 287-301.
- Lusk, J., J. Roosen and J. A. Fox (2003) "Demand for Beef from Cattle Administered Growth Hormones or Fed Genetically Modified Corn: A Comparison of Consumers in France, Germany, the United Kingdom, and the United States" *American Journal of Agricultural Economics* 85: 16-29.
- Michell, R. C. and R. T. Carson (1989) *Using Surveys to Value Public Goods: The Contingent Valuation Method*, Washington, D. C.: Resource for the Future.
- Payne, J. W., Bettman, J. R. and E. J. Johnson (1993) *The Adaptive Decision Maker* Cambridge: Cambridge University Press.
- Ready, R., J. Lawton and P. A. Champ (2006) "Respondent Uncertainty in Choice Experiments: A Comparison of Real and Hypothetical Choices" Presented at the W1133 meetings, San Antonio, Texas, February 22-23, 2006.