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Risk Preferences and Young Couples' Natural Sweetener Glycemic Index Information Valuation

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Problem Statement

The Glycemic Index (GI) of food is increasingly important for consumers, especially those suffering from overweight and obesity and at risk of Type II Diabetes. The number of diabetic Americans has risen by 81 percent in the last 30 years to 25.8 million individuals. A low GI diet is one way to manage and prevent Type II Diabetes. High GI foods can stimulate increased insulin releases contributing to diabetes risk. One policy option is to decrease the dietary GI for individuals using GI food labels. Thus, it is important to determine whether consumers value GI information. Further, it is unclear whether consumers with different risk preferences or living with partners with heterogeneous risk preferences have similar GI information needs.

Research Objectives and Hypotheses

Our research objective was to determine whether individuals with different risk preferences have differing willingness-to-pay (WTP) for lower GI natural sweeteners. We recruited young married and single consumers as they consume higher amounts of sweeteners than the general population (Smed, Jensen et al. 2007).

Null Hypothesis: Personal willingness-to-pay for low GI food is affected by spousal risk preferences.

Alternative Hypothesis: Individual willingness-to-pay for low GI food is independent of spousal risk preferences.

Data

Data were collected from participants 18 to 25 years of age during the spring 2010 academic semester. They were collected from 74 individuals or 37 married couples.

Experiment Design

We used a choice experiment design, based on Lusk and Schroeder (2004). The experimental design allowed individuals to select between five different oatmeal raisin cookies, baked with one of five natural sweeteners including beet sugar, high fructose corn syrup, Wyoming honey and non-Wyoming honey as well as agave nectar. All other ingredients were the same across the cookie selection. In addition, subjects received glycemic index and origin information for each sweetener. In the information sheet, subjects learned the glycemic index value of each sweetener type. The price levels of \$2.25, \$3.25 and \$4.25 per half dozen each occurred multiple times for each type of sweetener throughout the scenarios. We employed an orthogonal fractional factorial design which allowed the creation of efficient choice sets without making the number of the choice sets too large (Louviere and Woodworth, 1983). The final design resulted in 27 choice scenarios and a 28th choice scenario where all cookie choice alternatives displayed the same price level was added as a base scenario for evaluation.

In the risk experiment, participants made ten repeated choices between option A and option B, where each option was a lottery that paid one of the two amounts. Lottery A paid either \$5.00 or \$4.00 and Lottery B paid either \$9.60 or \$0.25. In each decision, lottery A was referred to as the "safe" choice and lottery B as the "risky" choice, since lottery A had less variability in the payoffs than lottery B. For each decision, a subject had to choose either option A or option B. In the first few decisions, the expected payoff was higher for option A, and it was less risky than for option B. As the subjects proceeded through the choices, the expected payoffs for option B became more rewarding as their payoff increased. Following Holt and Laury (2002), individuals' risk aversion parameters were measured according to the point at which he or she began choosing option B.

Questionnaire and Anthropometric Measures

The questionnaire was designed to assess subjects' socioeconomic, demographic and health details and nutritional knowledge.

Height and weight were measured according to standard procedures with the subjects in light clothing and no shoes. Body weight was measured to the nearest 0.1 kg using electronic scale weighting system TANITA (TANITA Corporation, Japan) and height was measured to the nearest 0.1 cm using a stadiometer (Invicta Plastics Limited 1990, Leicester, England). Body Mass Index was calculated as weight in kilograms divided by height in meters squared. Individuals were considered to be overweight if their Body Mass Index value was between 25.0 kg/m² and 29.9 kg/m², and obese if they had Body Mass Index 30.0 kg/m² or higher (Centers for Disease Control and Prevention, 2011). It was hypothesized that an individual with lower Body Mass Index will be more health conscious and thus, he or she will prefer natural sweeteners with lower glycemic indices.

Econometric Modeling

Consumers' willingness-to-pay for different natural sweeteners was evaluated using a multinomial logit random utility model. Following Louviere et al. (2000), the probability of consumer I choosing choice alternative k can be represented as

$$Pr ob_{ik} = \frac{e^{V_{ik}}}{\sum_{l \in J} e^{V_{il}}} \quad \forall I \in J \quad \text{where } e \text{ represents the base}$$

Of the natural logarithm, and I is the possible choices in the choice set, J . The multinomial results were then used to estimate the marginal effects. The marginal effects or the change in the predicted probability of choosing a particular sweetener as a unit change in the variable for which the marginal effect was estimated, all other factors held constant (Mayen et al. 2007). The marginal effects are

$$\frac{\partial p_k}{\partial X_k} = p_k \left(\beta_k - \sum_{l=1}^J p_l \beta_l \right)$$

Where X represents the vector of perceived sweetener attributes associated with alternative k , θ is the set of estimated parameters and I is the possible cookie alternative in choice set J . The marginal effects were estimated via the LIMDEP statistical software.

Results Highlights

- Individuals' baseline willingness-to-pay for the decreased glycemic load of agave nectar sweetener cookies was \$0.31 per half dozen cookies.
- Men were more likely to purchase cookies, in general, than women.
- Joint decisions, whether with a spouse or random stranger, were not significantly different than individual decisions. However, they did change when the combined risk aversion level of the two individuals increased. If the combined risk aversion level increased, so did the probability the two decided to forego a cookie purchase.

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