# FOOD PREFERENCES AND DISCRETE CHOICE EXPERIMENT SURVEY

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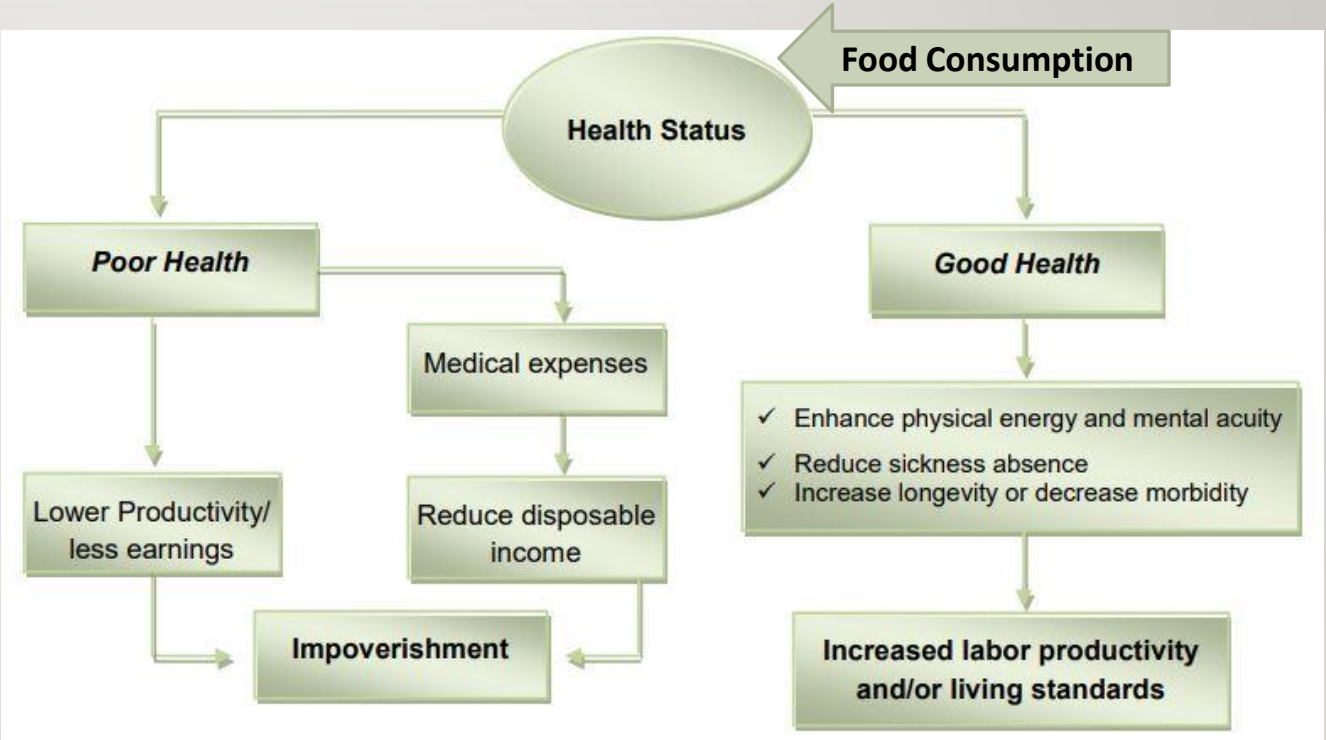
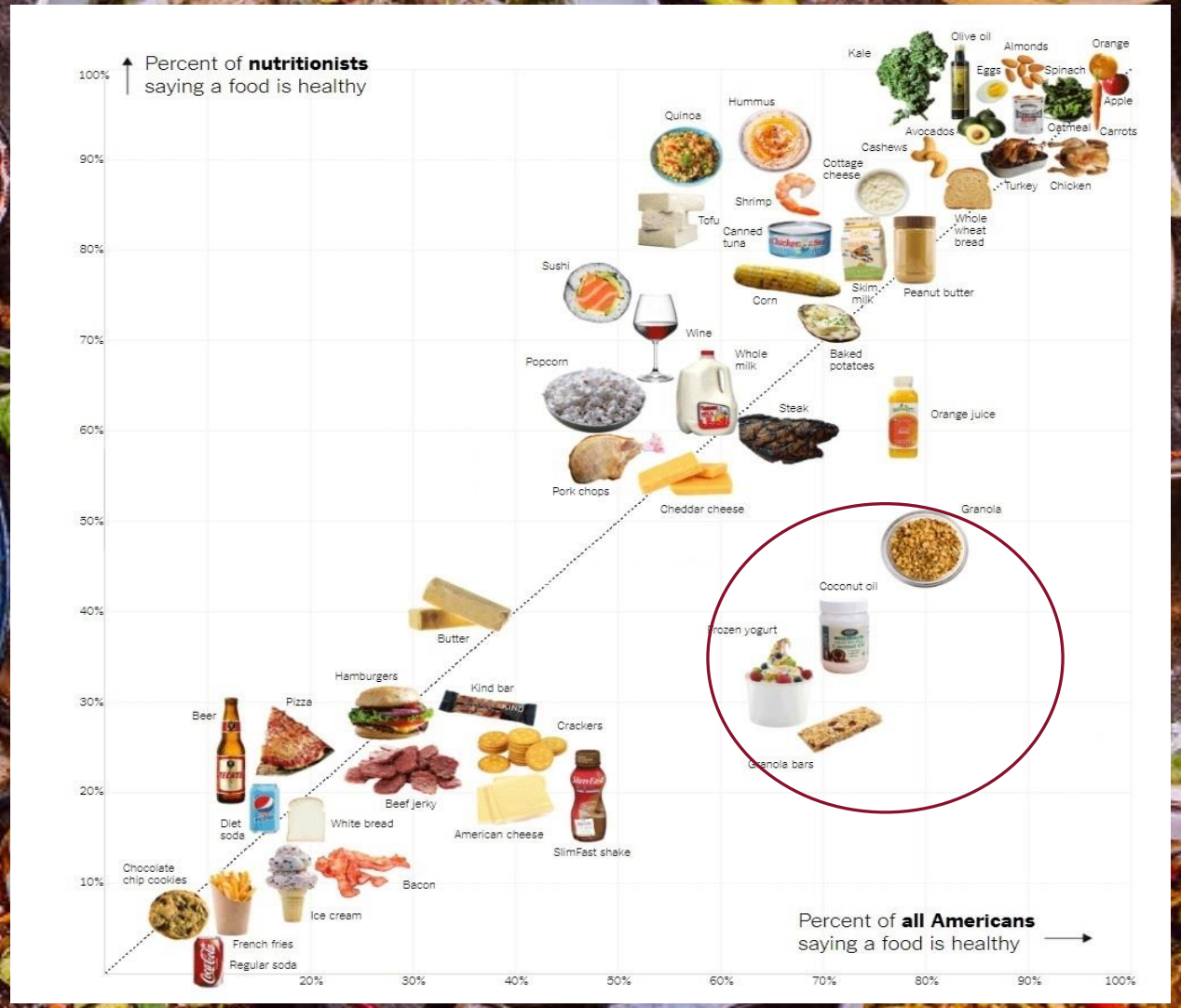
# HEALTH, NUTRITION, AND PRODUCTIVITY

- Health is a form of human capital; it is expected to be related to labor market success. [1]
- Food nutrition also affects health status which is associated with productivity. [2,3]



# WHAT IS HEALTHY FOOD?

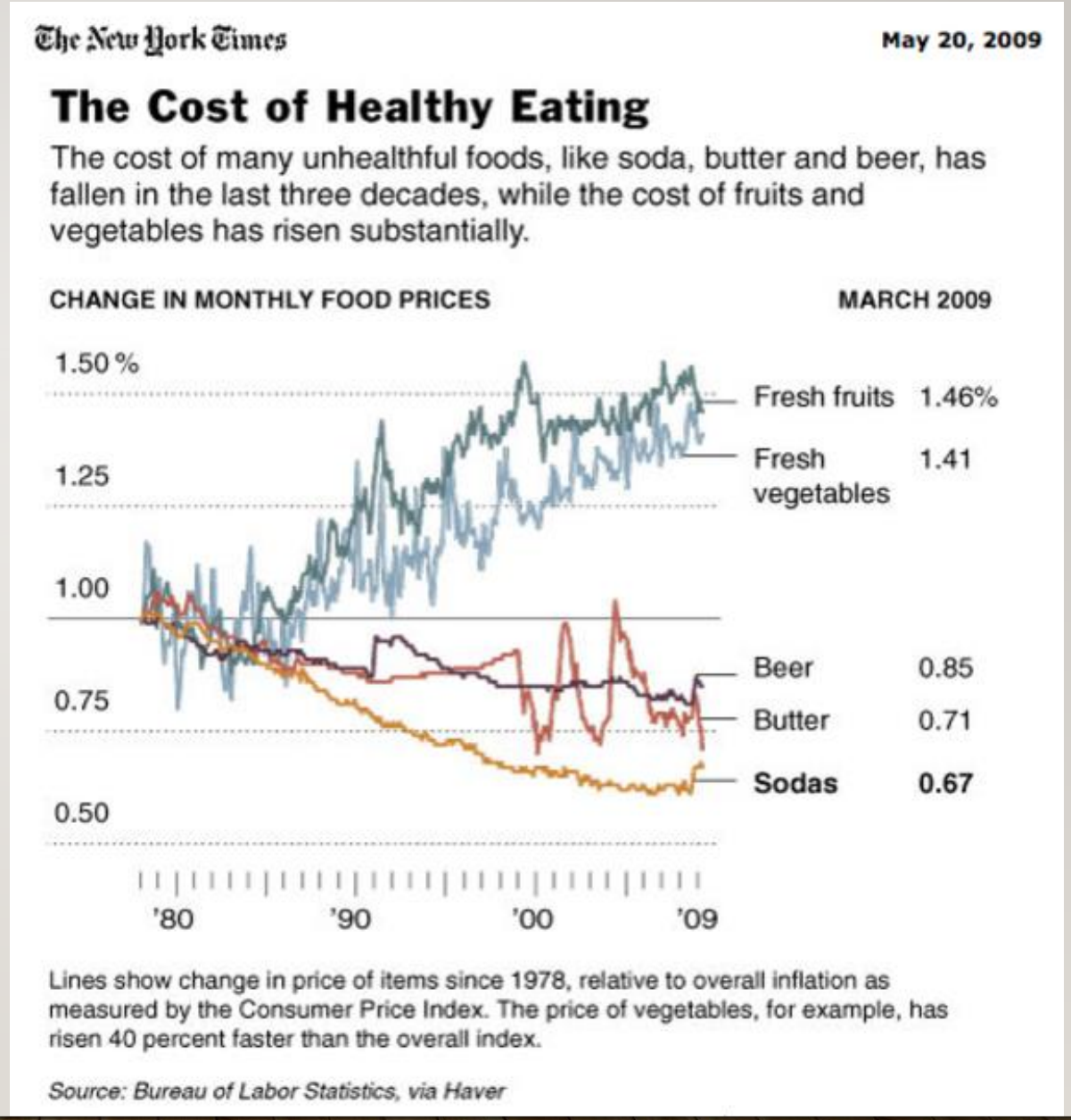
**A positive correlation between percent of nutritionist saying a food is healthy and percent of all Americans saying a food is healthy.**




Source: https://www.nytimes.com/slideshow/2020/06/10/learning/graphs-charts-and-maps-from-three-years-of-whats-going-on-in-this-graph/s/WGOITGraph10-10-17LN5.html

# WHY EATING HEALTHY IS NOT EASY?

- **Food Costs:** The price of healthier foods was nearly twice as high as the price of unhealthy foods ($0.590 vs $0.298 per serving).[4]



# WHY EATING HEALTHY IS NOT EASY?

FOOD DESERTS are geographic areas with more unhealthy food options ***[Availability]***, limited access ***[Accessibility]*** to affordable and quality healthy food ***[Affordability].***[5]

- ✓ SES is one of the factors contributing to healthy eating barriers.
- ✓ Other food preferences: taste, convenience, food allergy, etc.

# FOOD PREFERENCES

**Food attributes** affecting food preference can be categorized into 2 categories:

- **Intrinsic food attributes:**

  They are related to the physical aspects of a product (e.g. taste, texture, odor, flavor, energy, healthiness, nutrients (+/-) etc.)

- **Extrinsic food attributes:**

  They are related to the product, but not in the physical part (e.g. price, convenience, packaging, advertising, peer influence, family, culture etc.)

# ELICITING FOOD PREFERENCES THROUGH SURVEY

- Likert Scale Survey

Rate the importance of each snack attribute when you purchase a snack.

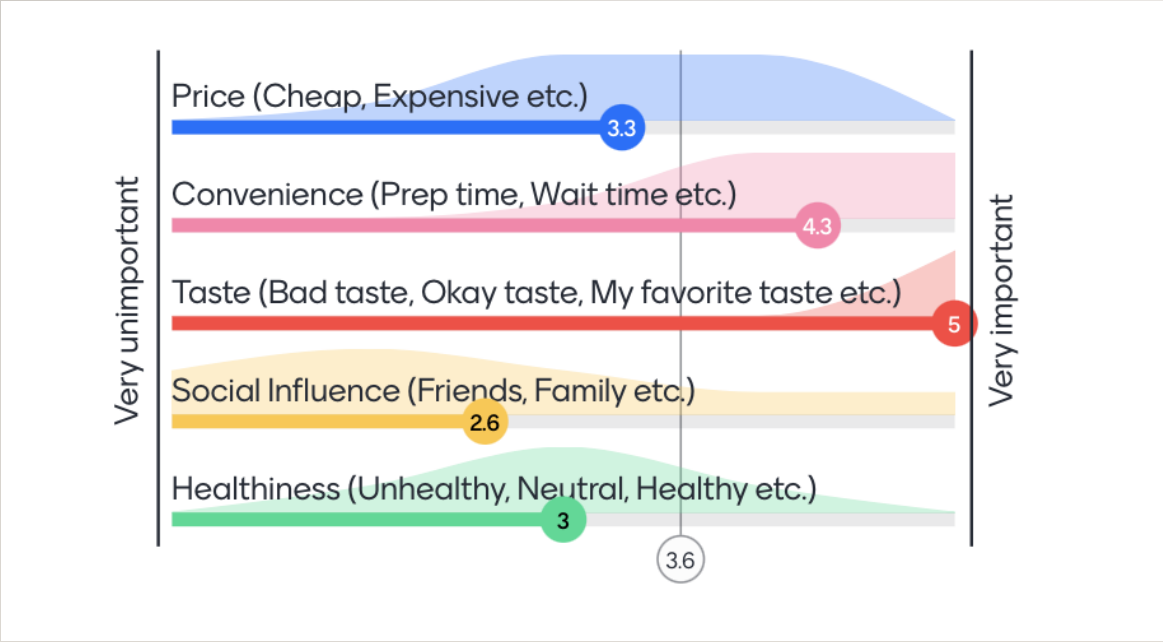
| | Very Unimportant | Unimportant | Neutral | Important | Very Important |
|---|---|---|---|---|---|
| Price | ○ | ○ | ○ | ○ | ○ |
| Convenience | ○ | ○ | ○ | ○ | ○ |
| Taste | ○ | ○ | ○ | ○ | ○ |
| Social influence | ○ | ○ | ○ | ○ | ○ |
| Healthiness | ○ | ○ | ○ | ○ | ○ |

- Ranking Scale Survey

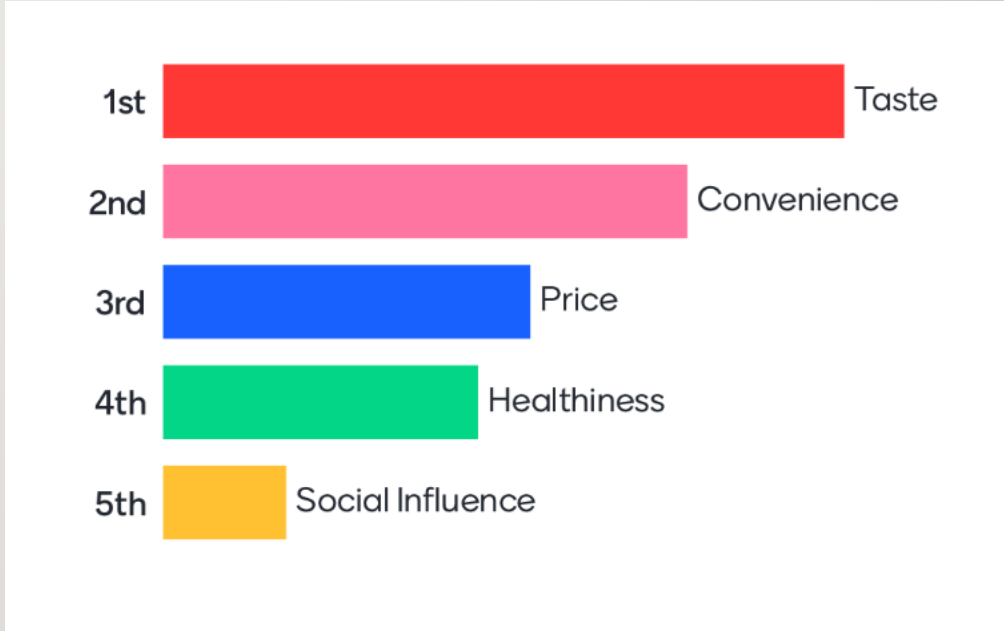

Go to www.menti.com and use code 49085191

# RESULTS

- Liker Scale Survey




- Ranking Scale Survey



# ELICITING FOOD PREFERENCES THROUGH SURVEY

DISCRETE CHOICE EXPERIMENT SURVEY

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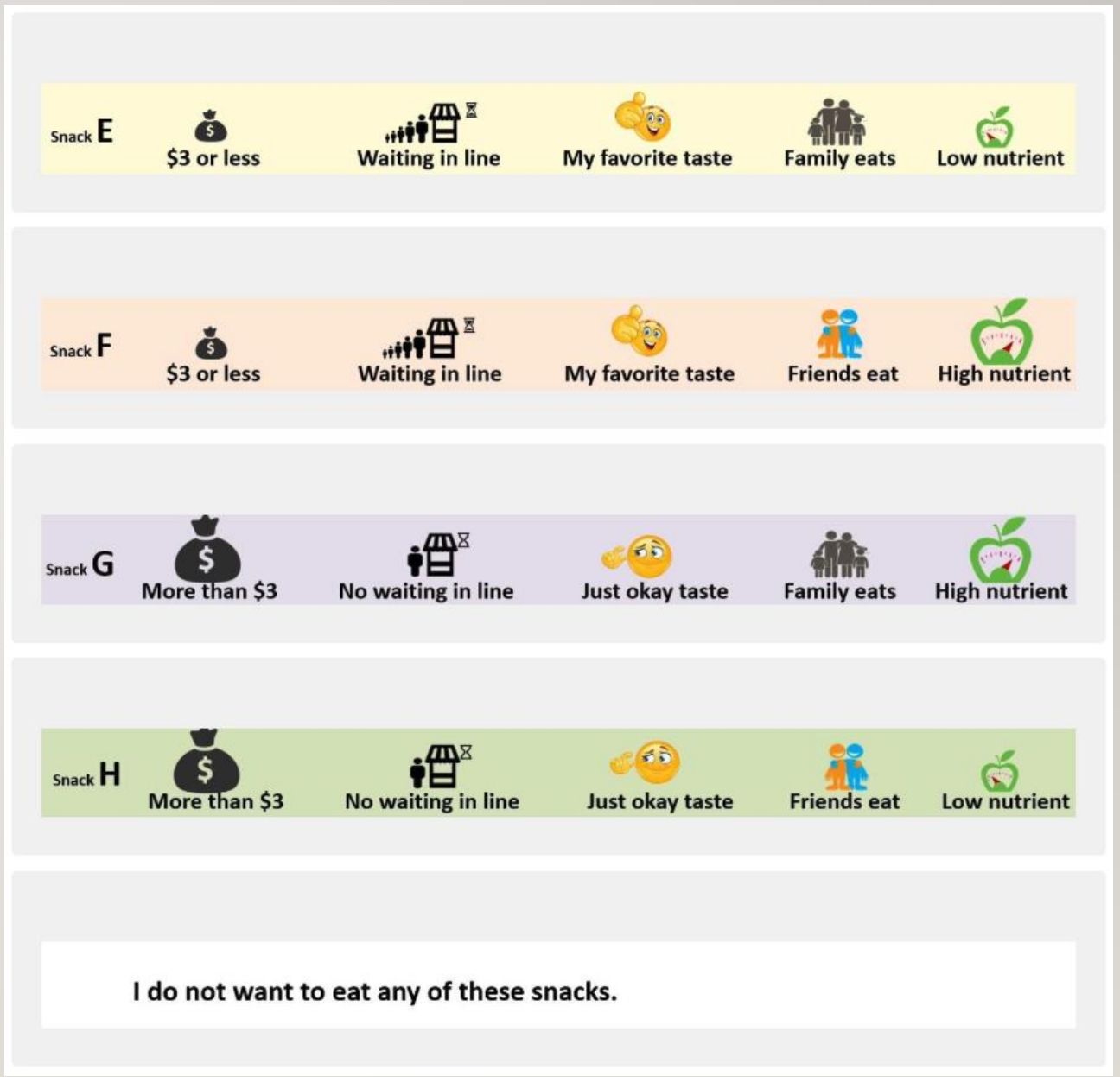

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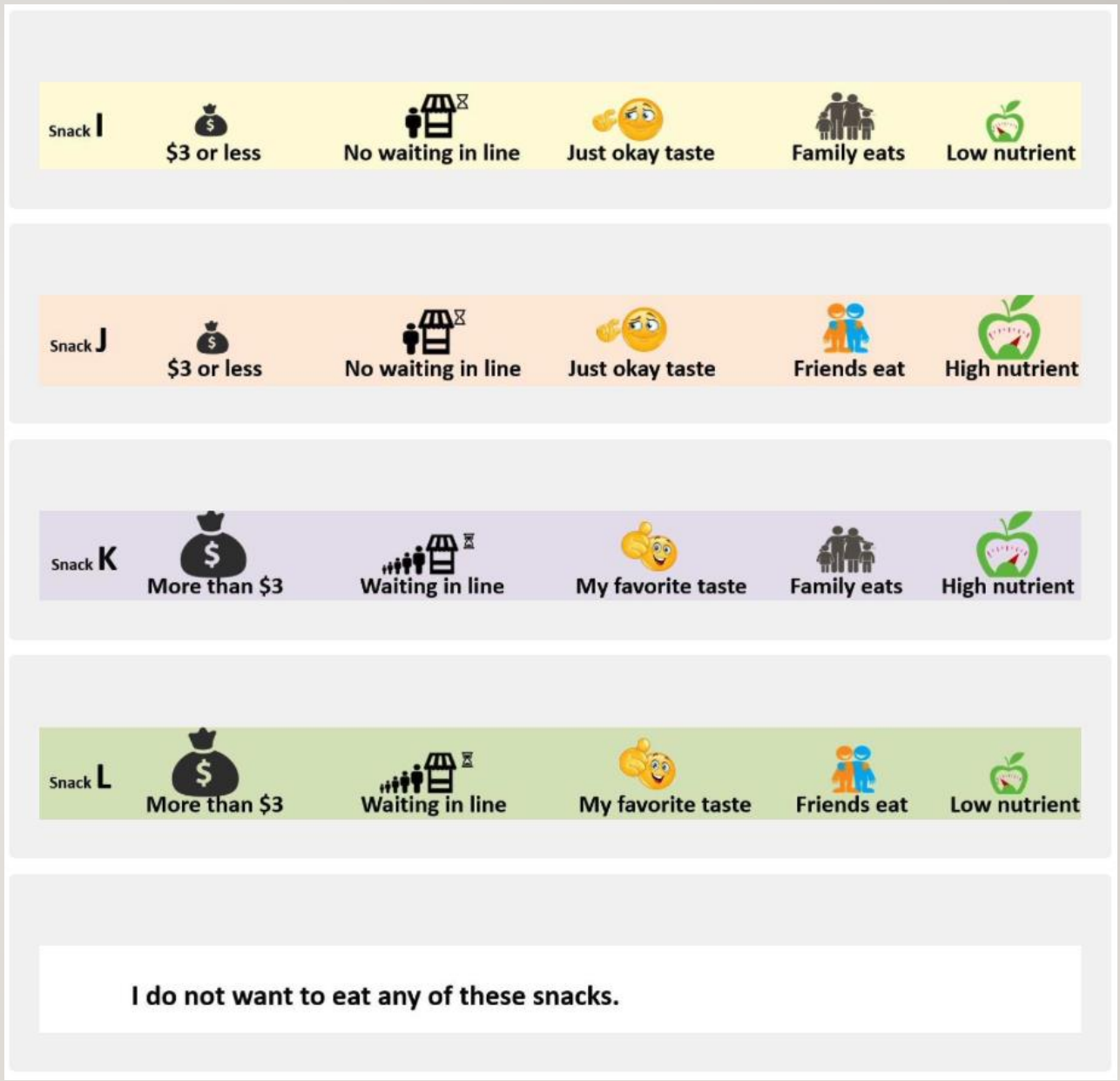
DISCRETE CHOICE EXPERIMENT SURVEY



# ELICITING FOOD PREFERENCES THROUGH SURVEY

DISCRETE CHOICE EXPERIMENT SURVEY

# THE CHOICES THAT MOST STUDENTS IN THIS CLASS SELECTED

| | | | | | |
|---|---|---|---|---|---|
| Snack C | More than $3 | No waiting in line | My favorite taste | Family eats | High nutrient |
| Snack F | $3 or less | Waiting in line | My favorite taste | Friends eat | High nutrient |
| Snack G | More than $3 | No waiting in line | Just okay taste | Family eats | High nutrient |
| Snack J | $3 or less | No waiting in line | Just okay taste | Friends eat | High nutrient |
| Snack M | $3 or less | No waiting in line | My favorite taste | Family eats | High nutrient |

# DISCRETE CHOICE EXPERIMENT (DCE) SURVEY

- DCE is a survey method to facilitate the understanding of subjects' preferences.
- DCE is contributing to the ever-growing literature on food/beverage preferences, including snack branding[6], food and snack choices[7,8,9] , food nutrition [10] , and wine preferences.[11]
- DCE better represents
  - the trade-offs between attributes subjects must consider when making a decision;
  - a resemblance real-life situations that subjects make decisions based on several choices offered, each of which features a combination of multi-level attributes.[12]

# EXAMPLE OF DCES IN HEALTH ECONOMICS

- Preferences for exiting COVID-19 lockdown measures in Germany [13]
  - ➢ identify trade-offs between different exit strategies.

| Attribute | Situation A | Situation B |
|---|---|---|
| *Re-opening schools* | In 4 weeks  | Immediately  |
| *Re-opening restaurants and bars* | Immediately  | In 4 weeks  |
| *Tracing app* | Voluntary  | Mandatory  |
| *Quarantine for persons above 70 years* | No  | Yes  |
| *Available ICU capacities* | Sufficient  | Temporarily overloaded  |
| *Unemployment rate* | 10 %  | 5 %  |
| **I decide for…** | ☐ | ☐ |

# EXAMPLE OF DCES IN HEALTH ECONOMICS

- Factors related to vaccine characteristics [14]
  - Their social normative influence and convenience of vaccination can affect the public's preference for the uptake of the COVID-19 vaccine in China.

| | Vaccine A | Vaccine B |
|---|---|---|
| Effectiveness | 50 | 90 |
| Protective duration (Month) | 18 | 6 |
| Adverse event | Fever 1-2 days | None |
| Frequency of injection | 3 | 2 |
| Price (CNY) | 200 | 0 |
| Place of origin | Imported | Domestic |
| Which one is more attractive | ☐ | ☐ |

# EXAMPLE OF DCES IN ECONOMIC DEVELOPMENT

- Skills and the university graduate recruitment process [15]

  (1) the selection of suitable candidates for job interviews based on CVs

| Of these 3 candidates, which one would you invite to a job interview? Remember this is a junior position for a recent higher education graduate | | | |
|---|---|---|---|
| **Degree:** Bachelor (BA, BSc) **Match of field of study and job tasks:** Field of study related to job tasks but no exact match **Relevant work experience:** No **Study abroad:** No **Grade Point Average:** Above average **Type of university:** Average ranked university **Starting Salary:** Average for this position | **Degree:** Master (MA, MSc) **Match of field of study and job tasks:** Field of study unrelated to job tasks **Relevant work experience:** 2 years **Study abroad:** Partly **Grade Point Average:** Average **Type of university:** Average ranked university **Starting Salary:** 25% below average for this position | **Degree:** Doctorate **Match of field of study and job tasks:** Field of study matches job tasks completely **Relevant work experience:** 1 year **Study abroad:** Entirely **Grade Point Average:** Below average **Type of university:** Top ranked university **Starting Salary:** 25% above average for this position | None of these |
| 1 | 2 | 3 | |

# EXAMPLE OF DCES IN ECONOMIC DEVELOPMENT

(2) the hiring of graduates based on observed skills

| Of these 3 candidates, which one would you hire?<br>Remember this is a junior position for a recent higher education graduate | | | |
|---|---|---|---|
| **Starting Salary:**<br>10% below average for this position<br>**Professional expertise:**<br>Bottom 25%<br>**General academic skills:**<br>Top 25%<br>**Innovative/creative skills:**<br>Top 25%<br>**Strategic/organizational skills:**<br>Average<br>**Interpersonal skills:**<br>Bottom 25%<br>**Commercial/entrepreneurial skills:**<br>Average | **Starting Salary:**<br>Average for this position<br>**Professional expertise:**<br>Average<br>**General academic skills:**<br>Average<br>**Innovative/creative skills:**<br>Bottom 25%<br>**Strategic/organizational skills:**<br>Bottom 25%<br>**Interpersonal skills:**<br>Top 25%<br>**Commercial/entrepreneurial skills:**<br>Bottom 25% | **Starting Salary:**<br>10% above average for this position<br>**Professional expertise:**<br>Top 25%<br>**General academic skills:**<br>Bottom 25%<br>**Innovative/creative skills:**<br>Average<br>**Strategic/organizational skills:**<br>Top 25%<br>**Interpersonal skills:**<br>Average<br>**Commercial/entrepreneurial skills:**<br>Top 25% | None of these |
| **1** | **2** | **3** | |

# DCE DESIGN AND ANALYSIS

- **Design:** as the number of attributes increases, so does the number of possible choice sets, which can be overwhelming for the subjects.
  - For example, a full factorial design of these five attributes, each with two levels, consists of 32 ($2^5$) possible combinations.
- To reduce the number of choice sets and ensure unbiased coefficient estimation, the study can use several methods to design choices and optimal choice set. :
  - A D-efficient design using NGENE program [16]
  - A Fractional Factorial Design [17]
  - A Blocked Fractional Factorial Design (BFFD) [18]
- **Analysis:** Multinomial Logit Model (MNL) , Conditional Logit (CL)
  - Estimate the interaction between attributes [8,9]
  - Estimate the interaction between attribute and SES [8,9]
  - Calculate the relative importance [8,9]

# LIMITATION

- Cognitive burden in general.
- Despite a less cognitively taxing survey design, the choice task of the DCE may become **too challenging for subjects if many attributes are included in the model.**

| Attributes | Vehicle Like Present One | More Fuel-Efficient Gasoline or Alternative-Fuel Vehicle | Electric Vehicle |
|---|---|---|---|
| **Purchase Price** | Price respondent would pay for next car | same as 1st column<br>10% less<br>10% more | same as 1st column<br>10% less<br>10% more |
| **Annual Repair & Maintenance Cost** | Average annual maintenance expenditure | same as 1st column<br>25% less<br>25% more | same as 1st column<br>25% less<br>25% more |
| **Acceleration** | Like present one | same as 1st column<br>25% poorer<br>25% better | same as 1st column<br>25% poorer<br>25% better |
| **Cruising Range** | 300 miles | 300 miles | 100, 200, 300 miles |
| **Refueling Rate** | 5 mins | 5 mins<br>10 mins<br>15 mins | 15 mins<br>30 mins<br>5 hours (at home or work) |
| **Polluting Emissions as % of present vehicle** | 85% | 0%<br>35%<br>65% | 0% |
| **Commuting time (One Way)** | Current trip time to work | same as 1st column<br>25% less<br>50% more | same as 2nd column<br>OR if 2nd= 1st, then:<br>same as 1st column<br>25% less<br>50% more |
| **Commuting Fuel & Parking Cost (Weekly)** | Commuting fuel cost * {1 or 2 or 3} + Parking cost | same as 1st column<br>25% less<br>50% less + Parking Cost | same as 1st column<br>50% less<br>75% less + Parking Cost |

# LIMITATION

- As with any survey, the **endogeneity bias** may occur as a consequence of omitted variables/attributes.
- DCE can only elicit **stated preferences** because subjects make a decision based on the hypothetical choices available, not the choices in a real-life situation.
- **Hypothetical bias** may arise when choice tasks do not fully reflect reality in the characteristics of choices.
- In any **experimental settings**, subjects know their decisions are being thoroughly investigated and examined, thus their decision-making is likely to be influenced by controlled, deliberate, and effortful processes even though subjects are assured of anonymity of their actions

# Q&A

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