Using discrete choice experiments in applied research: does the presentation and device type influence respondents’ responses, behaviour and experience?

Mr Max Felder (FORS) - Presenting Author
Max.felder@fors.unil.ch

Mr Nicolas Pekari (FORS)
Dr Oliver Lipps (FORS)
Ms Nathalie Eggenberg (FORS)
Ms Gisana Riedo (FORS)
Ms Coline Kaufmann (FORS)
Mr Victor Legler (FORS)
Ms Michelle Cohen (FORS)
Increased and broaden use of discrete choice experiment and other similar methods

Completing online surveys using smartphones is increasingly widespread and easy

Mobile screen orientation impacts the presentation of DCE tasks

The orientation depends on the preferences and compliance of participants
Theoretical Background

• There is almost no literature on how to display discrete choice experiments and similar methods so that they are adapted to smartphones

• Research on design elements in general has mostly focused on the complexity of the tasks: number of dimensions, number of repetitions, as well as order effects
  – One exception is Dülmer & Giza (2019), who studied the difference between tables and text for vignettes in a factorial survey

• Regarding smartphones, Vass & Boeri (2021) studied the difference between the results from a DCE depending on the device type. The authors found no difference and recommend allowing users to use their preferred device, but recommend researchers optimize the instruments accordingly


Method
Method – Population, Subject and Type of Experiment

Method
- Online survey using Qualtrics

Population
- Qualtrics online panel of French-speaking Swiss residents
  - 1,017 respondents (50.1% women, age $M=42$ years old)
  - 494 smartphone respondents (target population in this presentation)

Subject
- Attitudes towards climate change

Discrete choice experiment
- Pro-environmental measures aimed at reducing carbon footprint
- 7 dimensions, 5 choices between two scenarios
## Method - Variables

<table>
<thead>
<tr>
<th>Dependent variables</th>
<th>Independent variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Choice of scenario</td>
<td>• Experimental : orientation</td>
</tr>
<tr>
<td></td>
<td>→ Horizontal vs. Vertical vignette presentation</td>
</tr>
<tr>
<td>• Self-reported ease with the vignette task</td>
<td>• Self-reported skills using smartphones</td>
</tr>
<tr>
<td>• Screen rotation behaviour</td>
<td>• Sociodemographics</td>
</tr>
<tr>
<td>• Time spent on each task</td>
<td></td>
</tr>
</tbody>
</table>
Qualtrics’s Conjoint Analysis Package

Display

- Card view (recommended for mobile)
  
<table>
<thead>
<tr>
<th>Option 1</th>
<th>Option 2</th>
<th>Option 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Dish</td>
<td>Main Dish</td>
<td>Main Dish</td>
</tr>
<tr>
<td>Steak</td>
<td>Chicken</td>
<td>Chicken</td>
</tr>
<tr>
<td>Side</td>
<td>Side</td>
<td>Side</td>
</tr>
<tr>
<td>Fries</td>
<td>Fries</td>
<td>Salad</td>
</tr>
<tr>
<td>Drink</td>
<td>Drink</td>
<td>Drink</td>
</tr>
<tr>
<td>Water</td>
<td>Soda</td>
<td>Water</td>
</tr>
<tr>
<td>Price</td>
<td>Price</td>
<td>Price</td>
</tr>
<tr>
<td>$15</td>
<td>$15</td>
<td>$20</td>
</tr>
</tbody>
</table>

- Table view (traditional display for conjoint)
  
<table>
<thead>
<tr>
<th>Option 1</th>
<th>Option 2</th>
<th>Option 3</th>
</tr>
</thead>
<tbody>
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<td>$20</td>
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</tbody>
</table>

Modulpaket 1

- Wahlfach 1: Cross-Cultural Psychology
- Pflichtfach 1: Social Psychology
- Wahlfach 2: Crime in Society
- Pflichtfach 2: Research Methods and Statistics
- Pflichtfach 3: Behavioural Neurosciences

Modulpaket 2

- Wahlfach 1: Contemporary Research in Psychology
- Pflichtfach 1: Developmental Psychology
- Wahlfach 2: Counselling and Forensic Psychology
- Pflichtfach 2: Introduction to Psychology
- Pflichtfach 3: Behavioural Neurosciences
### Vignette Designs

#### “Horizontal”

<table>
<thead>
<tr>
<th>Comportements</th>
<th>Scénario A</th>
<th>Scénario B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limiter la consommation de viande à :</td>
<td>2 jours par semaine</td>
<td>0 jour par semaine</td>
</tr>
<tr>
<td>Consommer que des fruits et légumes produits :</td>
<td>en Suisse</td>
<td>Aucune restriction</td>
</tr>
<tr>
<td>Limiter l’achat de nouveaux vêtements à :</td>
<td>Aucune restriction</td>
<td>1 fois tous les 2 ans</td>
</tr>
<tr>
<td>Garder le même téléphone portable au minimum :</td>
<td>5 ans</td>
<td>3 ans</td>
</tr>
<tr>
<td>Limiter le chauffage en hiver à :</td>
<td>16°C</td>
<td>Aucune restriction</td>
</tr>
<tr>
<td>Limiter les voyages en avion à :</td>
<td>2 fois par an</td>
<td>2 fois par an</td>
</tr>
<tr>
<td>Limiter l’utilisation privée de la voiture à :</td>
<td>Aucune restriction</td>
<td>1 fois par semaine</td>
</tr>
</tbody>
</table>

#### “Vertical”

**Scénario A**

- Limiter la consommation de viande à : 0 jour par semaine
- Consommer que des fruits et légumes produits : en Europe
- Limiter l’achat de nouveaux vêtements à : 1 fois par an
- Garder le même téléphone portable au minimum : Aucune restriction
- Limiter le chauffage en hiver à : 20°C
- Limiter les voyages en avion à : Aucune restriction
- Limiter l’utilisation privée de la voiture à : 1 fois par semaine

**Scénario B**

- Limiter la consommation de viande à : 4 jours par semaine
- Consommer que des fruits et légumes produits : en Suisse
- Limiter l’achat de nouveaux vêtements à : 2 fois par an
- Garder le même téléphone portable au minimum : Aucune restriction
- Limiter le chauffage en hiver à : 16°C
- Limiter les voyages en avion à : 1 fois par an
- Limiter l’utilisation privée de la voiture à : 2 fois par mois
Vignette Display on Smartphone - Vertical

- Scenario A first
- Scenario B below

<table>
<thead>
<tr>
<th>Scénario A</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Limiter la consommation de viande à</td>
<td>4 jours par semaine</td>
</tr>
<tr>
<td>Consommer que des fruits et légumes produits :</td>
<td>dans les pays voisins</td>
</tr>
<tr>
<td>Limiter l'achat de nouveaux vêtements à</td>
<td>1 fois tous les 2 ans</td>
</tr>
<tr>
<td>Garder le même</td>
<td></td>
</tr>
</tbody>
</table>
Vignette Display on Smartphone - Horizontal

Rotating the mobile device screen allows for horizontal vignettes to be displayed fully (laterally)
Results
Does Orientation Impact Choice?

• Amongst smartphone non-experts, the choice is significantly more based on the first dimension when presented with vertical vignettes

→ They have different choice profiles when presented with vertical vignettes

• Auto-reported difficulty to perform the task isn’t impacted by orientation

→ Vertical display of vignettes seems to drive the participants to focus on the first dimension displayed

→ This tendency is not perceived/reported by the participants

→ What are the implications of horizontal presentation for smartphones users?
Compliance of Smartphones Users with Screen Rotation Instructions

- Results suggest a variety of profiles when it comes to compliance with the rotation instruction
  - Only one out of four respondents complies exactly when asked to
  - The most common behaviour (40% of participants) is to rotate the screen only when faced with the 1st truncated vignette
  - Another one out of four respondents never rotates their screen, and 10 respondents complied irregularly
- Other results
  - High self-reported competence with smartphones decreases compliance
  - Women comply more than men
  - Older people comply more

<table>
<thead>
<tr>
<th>Compliance</th>
<th>Frequency</th>
<th>Valid Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Already landscape</td>
<td>16</td>
<td>5.6 %</td>
</tr>
<tr>
<td>Comply early</td>
<td>73</td>
<td>25.4 %</td>
</tr>
<tr>
<td>Comply at 1st vignette</td>
<td>116</td>
<td>40.4 %</td>
</tr>
<tr>
<td>Mostly complied</td>
<td>10</td>
<td>3.5 %</td>
</tr>
<tr>
<td>Never complied</td>
<td>72</td>
<td>25.1 %</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>287</strong></td>
<td><strong>100 %</strong></td>
</tr>
</tbody>
</table>
Discussion

• Vignette orientation seems to impact the decision in discrete choice experiments when using a smartphone

• Classic horizontal presentation should be preferred

• Compliance with instructions varies across the population

• Does compliance impact the discrete choice experiment analysis results?

• What other types of instructions could yield better compliance levels (if necessary)?