

# A Step-by-Step Procedure to Implement Discrete Choice Experiments in Qualtrics

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## Abstract

Discrete choice experiment (DCE) is a well-established technique to elicit stated preferences. It is frequently used in social sciences, where revealed preferences are difficult or sometimes even impossible to collect. A DCE consists in a series of choice tasks, in which survey respondents are requested to select the alternative they prefer among a few ones. Even though DCEs are conceptually well-known and documented, the practitioner may face technical issues once turning to their concrete implementation. This methodological note provides a step-by-step procedure to implement a DCE using the survey software Qualtrics. The procedure is largely automated, relying on the statistical software Stata and using HTML code to display the choice tasks in a pleasant way. Basic knowledge of Stata and HTML is desirable but not an absolute requirement. This note is intended to Qualtrics users, and prior knowledge of this survey tool is therefore assumed. A full working example with all codes and material is provided and presented.

## Keywords

discrete choice experiment (DCE), experimental design, online survey, Qualtrics, Stata, HTML code

Discrete choice experiment (DCE) is a quantitative technique used for eliciting preferences in the absence of revealed (i.e., observed) preference data. DCEs have become popular in a range of research topics such as environmental valuation (e.g., Hoyos, 2010; Soliño & Farizo, 2014), transportation (e.g., Gundlach, Ehrlenspiel, Kirsch, Koschker, & Sagebiel, 2018; Stoiber, Schubert, Hoerler, & Burger, 2019), health (e.g., Lu et al., 2019; Soekhai, de Bekker-Grob, Ellis, & Vass, 2019), energy (e.g., Hille, Weber, & Brosch, 2019; Kubli, Looock, & Wüstenhagen, 2018), voting (e.g., Franchino & Zucchini, 2015), or labor demand and supply (e.g., Demel, Mariel, & Meyerhoff, 2019; Humburg & van der Velden, 2015). We illustrate DCEs' potential using two recent examples selected from the fields of transportation and health.

Transportation is expected to undergo radical changes in the near future under the effects of the digital transformation. In particular, autonomous vehicles (AVs) will reinvent personal

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Among the following travel options, which one do you prefer?

	Option 1	Option 2
Return airfare	\$650	\$450
Total travel time, including stops	5h	7h
Food/beverage	none	beverages + cold snack
Audio/Video entertainment	audio + short video clips	none
Type of airplane	Boeing 737	Boeing 777

Your choice:                       Option 1                       Option 2

**Figure 1.** An example of choice task. This choice task is a formatted version of Choice Task 1 in Table 5 of Street et al. (2005). The table containing the entire experimental design is reproduced in Figure 2.

transportation and have a transformative impact on the automotive industry. However, because AVs are still hardly available to consumers, it is not possible to observe by whom these vehicles are chosen and how they are used. In this context, stated-preference approaches seem the only possible way to make previsions about how such vehicles will be accepted and which attributes of the vehicles will be deemed as important. Stoiber, Schubert, Hoerler, and Burger (2019) have for instance devised a DCE to determine if AVs are likely to be shared and pooled. Arguably, this research question is of considerable importance: If indeed shared and pooled, AVs have the potential to yield a substantial reduction of the privately owned vehicles and of the number of kilometers driven. Answering this research question could therefore provide crucial recommendations to formulate efficient transportation policies.

Health economics is another area in which DCEs are commonly used. The typical objective of studies in this research field is to investigate patients' preferences and establish the impact of certain health-care interventions and aspects thereof on patients' decisions. Soekhai, de Bekker-Grob, Ellis, and Vass (2019) provide a broad and systematic review of this literature. A recent and representative example is provided by Lu et al. (2019), who investigate patients' preferences concerning the management of glaucoma, a chronic eye disease, which requires life-long monitoring with a variety of treatment options. In such a situation, like in a number of health-related issues, patient perspectives are of course crucial in designing acceptable services. DCEs therefore constitute an outstanding tool in the field of health.

In a DCE, survey respondents are requested to state their preferences across several alternatives in a series of so-called choice tasks, such as the one displayed in Figure 1. A choice task is composed

A: Choice tasks										B: Attributes and levels	
Choice task #	Option 1					Option 2					
	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>	
1	3	1	0	2	0	1	3	2	0	3	A <sub>1</sub> : Return airfare (0 = \$350, 1 = \$450, 2 = \$550, 3 = \$650)
2	2	0	1	3	3	1	3	2	0	0	A <sub>2</sub> : Total travel time, including stops (0 = 4h, 1 = 5h, 2 = 6h, 3 = 7h)
3	3	0	2	1	1	1	2	0	3	2	A <sub>3</sub> : Food/beverage (0 = none, 1 = beverages only, 2 = beverages + cold snack, 3 = beverages + hot meal)
4	2	2	2	2	3	3	3	3	3	2	A <sub>4</sub> : Audio/Video entertainment (0 = none, 1 = audio only, 2 = audio + short video clips, 3 = audio + movie)
5	1	0	3	2	1	2	3	0	1	0	A <sub>5</sub> : Type of airplane (0 = Boeing 737, 1 = Boeing 757, 2 = Boeing 767, 3 = Boeing 777)
6	1	2	0	3	1	0	3	1	2	2	
7	0	1	2	3	0	3	2	1	0	1	
8	1	1	1	1	3	0	0	0	0	0	
9	2	3	0	1	1	3	2	1	0	2	
10	0	2	3	1	3	2	0	1	3	0	
11	0	3	1	2	1	2	1	3	0	2	
12	0	1	2	3	1	1	0	3	2	0	
13	3	3	3	3	3	1	1	1	1	2	
14	0	0	0	0	3	2	2	2	2	2	
15	2	1	3	0	1	3	0	2	1	2	
16	3	1	0	2	3	0	2	3	1	0	

Note: this example is a reproduction from Table 5 in Street et al. (2005).

**Figure 2.** An example of experimental design. (A) Choice tasks. (B). Attributes and levels.

by a set of alternatives (options) characterized by various attributes. By varying the levels of the attributes across the alternatives and the choice tasks, the responses collected through a DCE allow to determine what shapes preferences of individuals and the relative importance of attributes. In Figure 1, there are five attributes used to describe long-distance flights. Such a choice experiment could be designed with the objective of investigating how consumers trade-off airfare against travel duration and video entertainment, hence determining their willingness-to-pay for a shorter flight or for having access to onboard video entertainment.

A crucial step toward the implementation of a DCE is the construction of an efficient experimental design. Indeed, because the number of possible choice tasks in an experiment is usually extremely large, it is necessary to select a reasonable number of meaningful choice tasks. In particular, choice tasks that encompass dominated alternatives do not convey any information to the researcher because they do not impose any trade-offs and should therefore be excluded. Often, the selected choice tasks are further divided into blocks (i.e., subsets of choice tasks) to reduce the burden on each respondent. The objective of the experimental design is thus to select the choice tasks and arrange them in blocks so that the parameters of interest can be reliably and efficiently estimated.

Fundamentally, an experimental design is nothing more than a matrix of values that determines what goes where in the DCE. The values that populate the matrix represent the (coded) attribute levels that will be used in the DCE: Every row represents a choice task, while every column represents an attribute of an alternative. Figure 2 shows an example of experimental design: Panel A reproduces the matrix itself with codes for attributes and their levels, while Panel B provides the labels of attributes and levels. This experimental design is borrowed from Street, Burgess, and Louviere (2005) and will be used throughout this article as a working example. Figure 1 corresponds to Choice Task 1 of this design.

While the creation of an efficient experimental design objectively is a complicated task, a wide literature exists on how to handle it (see, e.g., Johnson et al., 2013; Rose & Bliemer, 2009). On the contrary, very few references actually describe how to transform an experimental design (such as the one in Figure 2) into an operational survey (such as the one in Figure 1). As a result, practitioners may face technical challenges during this supposedly easy step, and implementing a DCE sometimes turns out to be more complicated than it seems.<sup>1</sup> In order to address this challenge, the present note offers a step-by-step procedure to implement a DCE in Qualtrics, a survey software that is quite widespread among academic researchers. This note is thus specifically intended to Qualtrics' users who need to integrate a choice experiment into their survey but may interest a wider audience, considering that the procedure presented here can be generalized to other software.

The procedure outlined here differs from that by Dropp (2014), who relies on JavaScript to handle the randomization of the levels of the attributes to be included in the choice tasks, which means that the construction of the experimental design is bypassed and left to Qualtrics' randomizer.<sup>2</sup> With this methodology, it therefore seems rather difficult to keep full control of what will be displayed and to ensure that the experimental design will be efficient. Instead, the solution proposed here is to use specialized software products (such as the most popular Ngene, SAS, or Sawtooth; see Soekhai et al., 2019) to create an efficient experimental design before transferring it to Qualtrics.<sup>3</sup> The researcher thus relies on specialized tools for every step of the project and keeps full control on what will be displayed during the DCE.

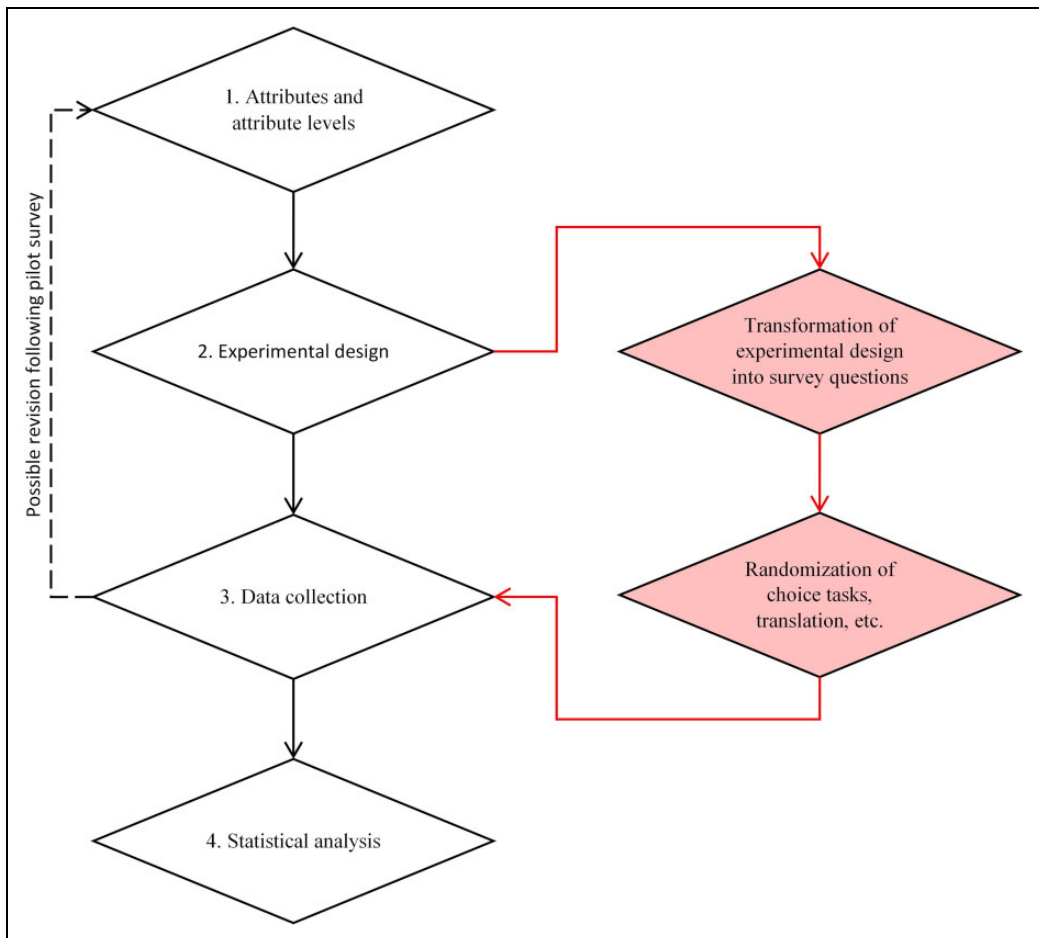
The remainder of this note is organized as follows. The section on "Key Stages in the Development of a DCE" summarizes the key stages for developing a DCE and shows where the present contribution fits. Section "From an Experimental Design to a (Qualtrics) TXT File" describes how to transform an experimental design enclosed in a spreadsheet into a TXT file that can be imported into Qualtrics. This step is conducted using the statistical software Stata, but the same principle may be conducted using alternative programs. Section "Import the TXT File Into Qualtrics" explains how to import the TXT file into Qualtrics. Section "Further Advanced Aspects" provides further advanced tips such as how to handle the translation of choice tasks in a multilanguage survey and how to implement randomization in the display order. The last section concludes. Various files and codes are provided as Supplementary Material, and an Appendix lists the main steps allowing to reproduce the example described in this note.

## **Key Stages in the Development of a DCE**

Complete overviews of the development of a DCE can be found in the literature. In particular, a very accessible discussion is provided by Mangham, Hanson, and McPake (2009), who outline the stages involved in undertaking a DCE, with an emphasis on the design considerations applicable in low-income countries, where DCEs are much less frequently applied than in high-income countries. Another outstanding reference is Johnson et al. (2013), who offer a solid introduction to constructing experimental designs and the importance thereof in a DCE. They summarize and compare a number of available approaches for constructing experimental designs. The key stages to the development of a DCE are illustrated in Figure 3 and briefly stated in order to place the present note in context.

### ***Attributes and Attribute Levels***

The first stage of a DCE is to identify the attributes relevant to the research question, that is, the characteristics that will be used to describe each alternative in the choice tasks. Once the attributes are established, levels must be assigned to each of these attributes. The levels should be selected to allow meaningful and realistic situations to be presented to respondents.



**Figure 3.** Key stages in the development of a discrete choice experiment.

This stage is very specific to the DCE's research question. It is usually conducted on the basis of literature reviews and interviews with experts. Very specific issues might arise at this stage. For instance, Mangham et al. (2009) highlight that access to relevant information can be a challenge to establish attributes and attribute levels in developing countries. Moreover, Coast and Horrocks (2007) question the rigor with which this stage is usually conducted and proposed a qualitative methodology to improve the definition of the attributes and their levels.

### *Experimental Design*

The number of possible alternatives is usually too large to have all respondents give their preference on all of them. For instance, with five attributes, each with four levels (such as in the example of Figure 2), there will be  $4^5 = 1,024$  different alternatives. If pairs of alternatives are to be formed, there will be  $1,024 \times 1,023/2 = 523,776$  different possible choice tasks. The objective of the experimental design is therefore to select the alternatives and the combinations of alternatives which are the most useful in that they force respondents to trade-off between the attributes and hence to provide information on their preferences. Efficient experimental designs maximize the precision of

estimated parameters of interest for a given number of choice tasks. In case the number of choice tasks is large, the researcher will have to consider blocking, a process in which blocks of choice tasks are created by partitioning the full set of choice tasks. Blocks thus contain a limited number of choice tasks, and each respondent will be randomly assigned to only one of these blocks.

A number of references specially dedicated to the construction of experimental design are available. In particular, Johnson et al. (2013) and Rose and Bliemer (2009) are essential for the reader interested in building a DCE. Currently, the most popular software tools for generating experimental designs are Ngene, SAS, and Sawtooth (see Soekhai et al., 2019). The user manuals of these programs are therefore useful references too.

### Data Collection

Once the experimental design is created, data collection must be organized through a survey. As a preliminary step, it is strongly advised to conduct a pilot (or pretest) on a few respondents to ensure that the technical setup of the survey faces no issues and that choice tasks are correctly understood by the respondents. A reasonable sample size for the pilot survey is around 20–40 respondents (see de Bekker-Grob, Donkers, Jonker, & Stolk 2015; World Health Organization [WHO], 2012). Answers collected via the pilot moreover provide an opportunity to conduct a first econometric analysis (see next stage) and test that coefficients are close to their expected value. Before the main survey is launched, one thus has the opportunity to review the experimental design using the parameters estimated from the pilot data as prior information in the final design (see Carlsson & Martinsson 2003; Rose & Bliemer, 2013).

The survey should be clearly presented and contain a nontechnical introduction to the DCE with choice task examples. Also, to minimize possible bias, it is good practice to randomize the order in which the choice tasks and attributes are presented to respondents.

A number of survey software products exist. In the present contribution, we focus on Qualtrics, an integrated tool that allows to set up sophisticated surveys, publish them, and collect responses. Regarding the implementation of DCE, the key functionality of that software is its capacity to import a survey from a file prepared outside the survey software itself. The strategy proposed in this note (see sections “From an Experimental Design to a (Qualtrics) TXT File” and “Import the TXT File Into Qualtrics”) is precisely to automate the formatting of a TXT file so that it can be imported into Qualtrics with only minimal handling.<sup>4</sup>

### Statistical Analysis

Once data have been collected, statistical analysis must be conducted to infer about respondents’ preferences. In a DCE, when respondents indicate their preferred alternative in a choice task, it is considered that they select the alternative that delivers the highest utility. The econometric analysis of preferences therefore relies on McFadden’s (1974) random utility theory. In this context, for a sample composed of  $N$  individuals (respondents) who stated their choice between  $J$  alternatives in  $T$  choice tasks, the utility function is usually written:

$$U_{njt} = \beta_n' x_{njt} + \epsilon_{njt} \text{ with } n = 1, \dots, N, j = 1, \dots, J, t = 1, \dots, T \quad (1)$$

where  $x_{njt}$  is a vector of attributes describing alternative  $j$  in choice task  $t$  of individual  $n$ ,  $\beta_n$  is a vector of parameters of interest, and  $\epsilon_{njt}$  is a random term. The probability of choosing alternative  $j$  can thus be modeled as follows:

$$P_{njt} = \text{Prob}(U_{njt} > U_{nlt}) \forall l \neq j \quad (2)$$

At this point, econometric analysis proceeds by making a number of assumptions and specification decisions, so that the estimation can be conducted using binary choice models, such as conditional logit models, in which case the parameters of interest are constant ( $\beta_n = \beta, \forall n$ ) or mixed logit models, in which the parameters vary over individuals ( $\beta_n$ ). Practically speaking, one has to shape the database so that each observation (line) corresponds to one alternative within a choice task, and a binary variable indicates whether the alternative has been selected (1) or not (0). This binary variable is then to be used as the dependent variable of the chosen binary choice model.

A deeper discussion of these econometric techniques is beyond the scope of this contribution, but the interested reader will find detailed presentations, including specific references to software allowing empirical estimations, in Hauber et al. (2016) or Lancsar, Fiebig, and Hole (2017).

Figure 3 illustrates the full process of developing a DCE, with the four key stages shown on the left. The present note focuses on the transition between the second and third stages. In fact, one could decompose this transition by inserting the (hitherto implicit) substages displayed on the right of Figure 3. Indeed, before data collection, the researcher will have to put the survey in good shape and deal with several practical issues such as randomization and translation (in case of a multilingual survey). This note is motivated by the fact that these substages are often overlooked in the literature but nonetheless constitute critical steps toward the successful implementation of a DCE.

## From an Experimental Design to a (Qualtrics) TXT File

To transform an experimental design into Qualtrics survey questions, the approach suggested here is to create one question for every choice task. Given that this is a highly repetitive job, it should of course be automated. In this respect, the possibility to import “advanced format TXT files”<sup>5</sup> in Qualtrics comes very handy. Qualtrics indeed allows for surveys to be imported using TXT files, using specific tags to delimit questions, answers, and so on.<sup>6</sup> Transforming an experimental design into survey questions hence amounts to formatting the information from a spreadsheet to a TXT file using the appropriate tags.

To carry out this transformation, one can therefore use a software to implement the following process (illustrated here using Stata code):<sup>7</sup>

1. Import the experimental design from the spreadsheet (named `ExpDesign.xlsx` in our example) into Stata. Since the experimental design is simply a matrix of numbers, this is a perfectly standard operation: Stata will simply import these numbers like any data set.

```
* Import experimental design from excel spreadsheet ExpDesign.xlsx
import excel using ExpDesign.xlsx
```

2. Format the information to be displayed to respondents in choice tasks. Concretely, this amounts to labeling the coded attributes and levels as they should appear in the final survey (see Figure 2A).

```
* Label attributes and levels
la var A1_1 "Return airfare"
recode A1_1 (0=350) (1=450) (2=550) (3=650)
* ... idem for attributes 2-4...
la var A1_5 "Type of airplane"
la def planelab 0 "Boeing 737" 1 "Boeing 757" 2 "Boeing 767" 3 "Boeing 777"
la val A1_5 planelab
```

3. Place each element of the experimental design in a structured table so that the choice task is presented in a clear and pleasant way. Because this step has to be repeated for every choice task, the only viable approach is to create a loop that iterates over the choice tasks and automates the production of the survey questions.

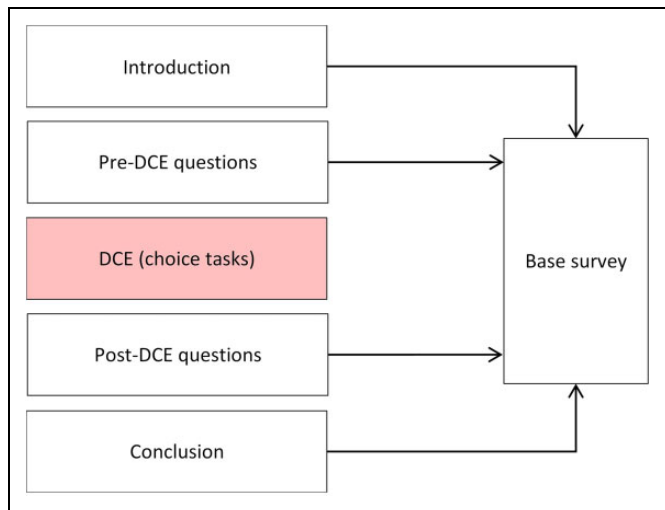
To import the DCE in Qualtrics and display the choice tasks like in Figure 1, the tables presenting the choice tasks should be constructed using HTML code and placed in a “Matrix Table Question” (tag [[Question: Matrix]] in advanced format TXT files). The strategy followed here is to place the HTML table containing the alternatives inside the question text, while the radio buttons allowing respondents to cast their choice are placed below and independently from the table. To perfectly align the columns of the table with the radio buttons, one must then fine tune the width of the HTML table columns.

The following Stata code provides a simplified version of the procedure (the full version is in Supplemental Appendix file ExpDesign\_to\_Qualtrics.do). The Stata user-written command `texdoc` (Jann, 2016) is used to create the TXT file.

```
*Create HTML tables and include them in a Qualtrics' advanced format TXT file
texdoc init DCE.txt, replace
tex[[ AdvancedFormat]]
forv n = 1 / =_N' {
    *Store attribute values
    forv i = 1 / 2 {
        forv j = 1 / 5 {
            local A `i' _ `j' = A `i' _ `j' [ `n' ]
        }
    }
    *Question
    tex[[ Question: Matrix]]
    tex Among the following travel options, which one do you prefer?

    *HTML table
    tex <table>
    tex <tbody>
    tex <tr>
    tex <td>&nbsp;</td>
    tex <td>Option 1</td>
    tex <td>Option 2</td>
    tex </tr>
    tex <tr>
    tex <td>Return airfaire</td>
    tex <td>`A1_1'</td>
    tex <td>`A2_1'</td>
    *...idem for attributes 2-4...
    tex </tr>
    tex <tr>
    tex <td>Type of airplane</td>
    tex <td>`A1_5'</td>
    tex <td>`A2_5'</td>
    tex </tr>
    tex </tbody>
    tex </table>

    *Choices
    tex Your choice:
    tex [[ AdvancedAnswers]]
```



**Figure 4.** Structure of the survey in which the discrete choice experiment is to be integrated.

```

tex[[ Answer]]
tex Option 1
tex[[ Answer]]
tex Option 2
}
texdoc close

```

Note that further Qualtrics' elements can be defined at this stage. In particular, question IDs (tag `[[ID: question ID]]`), question blocks (tag `[[Block: block name]]`), and page breaks (tag `[[PageBreak]]`) might prove useful.

The final output of the above procedure is a TXT file that contains all choice tasks of the experimental design and can be directly imported into Qualtrics.

## Import the TXT File Into Qualtrics

Typically, a DCE is part of a larger survey structured as depicted in Figure 4. A DCE should indeed be surrounded by various blocks of questions. In particular, pre-DCE questions are useful to provide instructions and frame the respondents, and post-DCE questions allow for instance to test respondents' understanding of the DCE and to collect various characteristics of the respondents.

The "advanced format TXT file" created in previous section contains only the choice tasks, that is, the red block in the middle of Figure 4. The white blocks have to be implemented directly in the survey software. From now on, we therefore proceed on the assumption that a base survey composed of the white blocks in Figure 4 already exists in Qualtrics.

### To Import the Choice Tasks Into the Qualtrics' Base Survey

0. Duplicate the base survey and store the copy as a backup. If anything goes wrong during the importation of the choice tasks, this copy can be used to restart the whole process quickly and without hassle.

1. Import the choice tasks using “Tools > Import/Export > Import Survey . . .” and locating the “advanced format TXT file” created before. The choice tasks will be placed at the end of the survey.
2. Carefully inspect the choice tasks. It is very likely that minor issues (such as typos, inappropriate wording, or unaesthetic spacing) will be detected because now is the first time they can be visualized in a user-friendly format. Having stored a copy of the base survey (Step 0 above) makes it possible to restart from the backup rather than having to remove all choice tasks (whose number is potentially large) every time a correction must be made. Also, it is good practice to avoid making any corrections in the choice tasks directly from within Qualtrics, but rather go back to Stata, implement the necessary corrections, rebuild the TXT file containing the choice tasks (section “From an Experimental Design to a (Qualtrics) TXT File”), and reimport the new TXT file into Qualtrics. Manual changes in the choice tasks are to be strictly avoided, as these would be very inefficient and inconvenient to reproduce.
3. If the choice tasks look as desired, move them from the end of the survey to where they should be placed in the survey. In Qualtrics, this can be achieved directly within the survey editor or (more efficiently) within the survey flow.<sup>8</sup>

At this point, a few advanced aspects such as randomization and translation (in multilanguage surveys) remain to be implemented. These are discussed in the next section.

## Further Advanced Aspects

### *Translation of the Choice Tasks*

This subsection is intended for readers dealing with multilanguage surveys and can be safely skipped by those preparing single-language surveys. We discuss the issue of translation here because it is best handled after having implemented a first version of the survey but before implementing the randomization of the choice tasks.

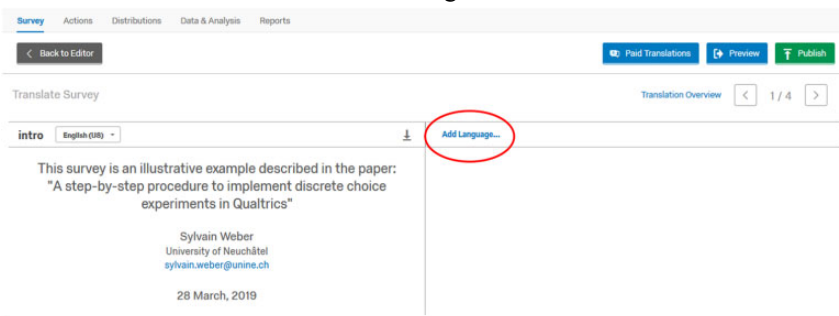
In multilanguage surveys, translating the choice tasks creates a major complication. Indeed, even though Qualtrics provides an embedded translation tool, the latter only allows to translate questions manually and one by one.<sup>9</sup> Therefore, considering the large number of choice tasks integrated in the survey, translating them one by one is not a realistic option. Instead, one must devise an automated solution, which builds on a procedure similar to that described in sections “From an Experimental Design to a (Qualtrics) TXT File” and “Import the TXT File Into Qualtrics” for each language of the survey.

In a nutshell, translating the choice tasks starts with the creation of multiple versions of the survey, one for each language. For clarity, let us call the first version of the survey (already implemented in sections “From an Experimental Design to a (Qualtrics) TXT File” and “Import the TXT File Into Qualtrics”) the *primary-language version* and call the additional versions *secondary-language versions*.<sup>10</sup> These multiple versions will be subsequently combined into a single survey using advanced capacities of the Qualtrics’ translator. The detailed procedure to obtain a properly translated survey unfolds as follows:

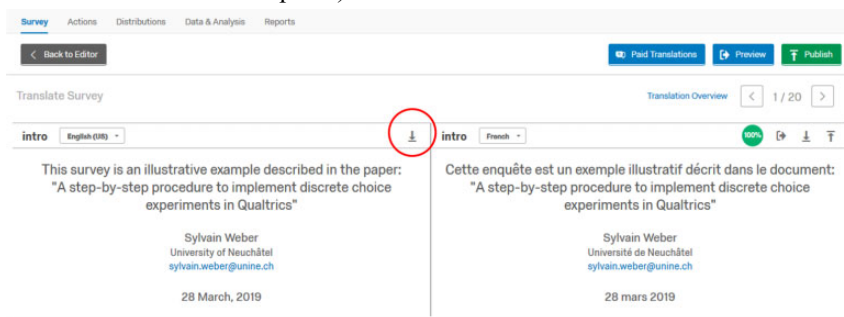
1. Forate one “advanced format TXT file” (see section “From an Experimental Design to a (Qualtrics) TXT File”). Note that Stata makes it possible to conveniently handle the creation of the multiple versions of the TXT file through “if” conditions.
2. Create one copy of the base survey (from Step 0 in section “Import the TXT File Into Qualtrics”) for each secondary language. Import every language-specific TXT file into Qualtrics in its corresponding copy of the base survey (see section “Import the TXT File Into Qualtrics”). In the secondary-language version(s), there will be an apparent “language

mismatch”: base survey (white blocks in Figure 4) in the primary language and choice tasks (red block in Figure 4) in the secondary language. This is normal and will be straightened out later. Before moving forward, remember to carefully inspect the choice tasks in all versions since language-specific issues might arise. In particular, it is likely that words differ in length and number across languages and this may affect columns’ width in the HTML tables presenting the choice tasks.

3. If the primary-language survey (from section “Import the TXT File Into Qualtrics”) is not yet prepared to accommodate several languages, go to the translation panel, click “Add Language . . .”, and tick all the languages that should eventually be available. Whether questions in the base survey are already translated or not does not matter. These can be translated either before or after translating the choice tasks.



4. For each language, download the translation file, by selecting “Tools > Translate Survey . . . ” and clicking on the “Download Translation” button (i.e., the downward pointing arrow in the middle of the translation panel).



In the window that pops up, select “Unicode Text (Excel)” and “All languages” and click “Download.”

#### Download translation

Choose format: **Unicode Text (Excel)**

Choose language: **All Languages**

For help using translation exports with Microsoft® Excel™, visit our [help site](#).

Cancel

**Download**



Click on “Browse” and locate the relevant translation file. A panel displaying the translation will open. All changes will be highlighted in yellow, which should be the case of all choice tasks in the secondary-language version.

Upload translation

English (US)	Old translation: French	New translation: French
<p>Insert here pre-DCE questions and introduction to DCE.</p> <p>Insert here the DCE (choice tasks).</p> <p>Insert here post-DCE questions and conclusion.</p> <p>Among the following travel options, which one do you prefer? &lt;br&gt;           &gt; &lt;br&gt; &lt;table border="1"&gt;           &lt;thead&gt;             &lt;tr&gt;               &lt;th&gt;tdfirst-child {border-left: none; border-top: none; }&lt;/th&gt;               &lt;th&gt;tdfirst-child {border-left: none; border-top: none; }&lt;/th&gt;             &lt;/tr&gt;           &lt;/thead&gt;           &lt;tbody&gt;             &lt;tr&gt;               &lt;td&gt;Return airfare&lt;/td&gt;               &lt;td&gt;\$650&lt;/td&gt;               &lt;td&gt;\$450&lt;/td&gt;             &lt;/tr&gt;             &lt;tr&gt;               &lt;td&gt;Total travel time, including stops&lt;/td&gt;               &lt;td&gt;5h&lt;/td&gt;               &lt;td&gt;7h&lt;/td&gt;             &lt;/tr&gt;             &lt;tr&gt;               &lt;td&gt;Food/beverage&lt;/td&gt;               &lt;td&gt;none&lt;/td&gt;               &lt;td&gt;beverages + cold snack&lt;/td&gt;             &lt;/tr&gt;             &lt;tr&gt;               &lt;td&gt;Audio/Video entertainment&lt;/td&gt;               &lt;td&gt;audio + short video clips&lt;/td&gt;               &lt;td&gt;none&lt;/td&gt;             &lt;/tr&gt;           &lt;/tbody&gt;         &lt;/table&gt; </p>	<p>Insérer ici les questions pré-DCE et l'introduction au DCE.</p> <p>Insérer ici le DCE (situation de choix).</p> <p>Insérer ici les questions post-DCE et la conclusion.</p> <p>Parmi les options de voyage suivantes, laquelle préférez-vous? &lt;br&gt;           &gt; &lt;br&gt; &lt;table border="1"&gt;           &lt;thead&gt;             &lt;tr&gt;               &lt;th&gt;tdfirst-child {border-left: none; border-top: none; }&lt;/th&gt;               &lt;th&gt;tdfirst-child {border-left: none; border-top: none; }&lt;/th&gt;             &lt;/tr&gt;           &lt;/thead&gt;           &lt;tbody&gt;             &lt;tr&gt;               &lt;td&gt;Retour aérien&lt;/td&gt;               &lt;td&gt;650 USD&lt;/td&gt;               &lt;td&gt;450 USD&lt;/td&gt;             &lt;/tr&gt;             &lt;tr&gt;               &lt;td&gt;Temps de voyage total, y compris les arrêts&lt;/td&gt;               &lt;td&gt;5 heures&lt;/td&gt;               &lt;td&gt;7 heures&lt;/td&gt;             &lt;/tr&gt;             &lt;tr&gt;               &lt;td&gt;Nourriture/bouteilles&lt;/td&gt;               &lt;td&gt;rien&lt;/td&gt;               &lt;td&gt;boissons + collation froide&lt;/td&gt;             &lt;/tr&gt;             &lt;tr&gt;               &lt;td&gt;Divertissement audio/vidéo&lt;/td&gt;               &lt;td&gt;audio + courts clips vidéo&lt;/td&gt;               &lt;td&gt;rien&lt;/td&gt;             &lt;/tr&gt;           &lt;/tbody&gt;         &lt;/table&gt; </p>	<p>Insérer ici les questions pré-DCE et l'introduction au DCE.</p> <p>Insérer ici le DCE (situation de choix).</p> <p>Insérer ici les questions post-DCE et la conclusion.</p> <p>Parmi les options de voyage suivantes, laquelle préférez-vous? &lt;br&gt;           &gt; &lt;br&gt; &lt;table border="1"&gt;           &lt;thead&gt;             &lt;tr&gt;               &lt;th&gt;tdfirst-child {border-left: none; border-top: none; }&lt;/th&gt;               &lt;th&gt;tdfirst-child {border-left: none; border-top: none; }&lt;/th&gt;             &lt;/tr&gt;           &lt;/thead&gt;           &lt;tbody&gt;             &lt;tr&gt;               &lt;td&gt;Retour aérien&lt;/td&gt;               &lt;td&gt;650 USD&lt;/td&gt;               &lt;td&gt;450 USD&lt;/td&gt;             &lt;/tr&gt;             &lt;tr&gt;               &lt;td&gt;Temps de voyage total, y compris les arrêts&lt;/td&gt;               &lt;td&gt;5 heures&lt;/td&gt;               &lt;td&gt;7 heures&lt;/td&gt;             &lt;/tr&gt;             &lt;tr&gt;               &lt;td&gt;Nourriture/bouteilles&lt;/td&gt;               &lt;td&gt;rien&lt;/td&gt;               &lt;td&gt;boissons + collation froide&lt;/td&gt;             &lt;/tr&gt;             &lt;tr&gt;               &lt;td&gt;Divertissement audio/vidéo&lt;/td&gt;               &lt;td&gt;audio + courts clips vidéo&lt;/td&gt;               &lt;td&gt;rien&lt;/td&gt;             &lt;/tr&gt;           &lt;/tbody&gt;         &lt;/table&gt; </p>

Click import. The translation of the survey is now complete, and the choice tasks can be moved to their definitive placement inside the survey.

### Randomization of Choice Tasks

As mentioned in section “Key Stages in the Development of a DCE”, it is good practice to randomize the order in which the choice tasks are presented to respondents in order to mitigate possible biases, for instance, due to survey length and the associated respondents’ boredom. Such a randomization can be implemented using the “Question Randomization...” in the “Block Options”:

CE\_Block1 - Mar 29, 2019

Among the following travel options, which one do you prefer?

	Option 1	Option 2
Return airfare	\$650	\$450
Total travel time, including stops	5h	7h
Food/beverage	none	beverages + cold snack
Audio/Video entertainment	audio + short video clips	none

- View Block...
- View Block in Survey Flow...
- Collapse Questions...
- Lock Block...
- Question Randomization...**
- Loop & Merge...
- Next/Previous Button Text...
- ▲ Move Block Up...
- ▼ Move Block Down...
- Add Block Below
- Copy Block...
- Copy Block To Library...
- Copy Questions To Library...
- Delete Block...

Even though the most obvious choice would be to tick “Randomize the order of all questions,” this solution should be avoided because all choice tasks would then be displayed in the same screen

to the respondents, which is certainly not great. Instead, one should set up an “Advanced Randomization.”

**Question Randomization**

- No Randomization
- Randomize the order of all questions
- Present only  of total questions
- Advanced Randomization** [Set Up Advanced Randomization](#)

*Note: Enabling Question Randomization will ignore page breaks, questions per page, skip logic and override question order.*

Close

Save

In the “Advanced Randomization” that will pop up, all choice tasks can then be placed in the “Randomize Questions” box, and the number of “Questions per Page” can be set to 1.

**Advanced Randomization**

**Fixed Display Order**  
Display the questions in the order they appear below:

{Randomized}

{Randomized}

{Randomized}

{Randomized}

{Randomized}

{Randomized}

{Randomized}

{Randomized}

**Randomize Questions**  
Randomize and insert all items from the list below:

Among the following travel options, which one

Among the following travel options, which one

Among the following travel options, which one

**Random Subset**  
Randomly insert  questions from the list below:

Evenly Present Elements

**Undisplayed Items**  
Do not display the questions below:

**Questions per Page**  
Show  questions on each page.

Close

Save

**Randomization of Respondents Across Blocks**

The original experimental design borrowed from Street et al. (2005) and used in this note as an example (Figure 2) does not contain any blocks. Nevertheless, as the number of choice tasks in an experimental design may be large, researchers will often have to consider blocking, that is, partitioning the experimental design into blocks that contain a limited number of choice tasks for each respondent.

For the purpose of the demonstration, let us partition the experimental design from Figure 2 in two blocks of eight choice tasks. As mentioned in section “From an Experimental Design to a (Qualtrics) TXT File”, the most efficient way to create the blocks in Qualtrics is to define them already in the advanced format TXT file using Stata. Alternatively, this could also be done afterward in Qualtrics by moving choice tasks in separate blocks by hand.

The randomization of respondents across the two blocks should be implemented in the “Survey Flow.” Before the first choice task, a “Randomizer” should be used to define an “Embedded Data” that takes the value 1 or 2 (or any value up to the number of blocks). This “Embedded Data” can then be used to create branches that will allow displaying blocks of choice tasks conditionally on the value of the “Embedded Data.”

Two remarks are in order. First, to randomize respondents in groups of equal size, the box “Evenly Present Elements” should be ticked in the “Randomizer.” Second, one should be aware that a “Randomizer” or a “Branch Logic” will disable the back button on the first page of the block that follows it. In the context of a DCE, this could be detrimental as respondents may want to go back to the description of the attributes when faced with the (first) choice task. The solution to avoid such a situation is to duplicate the block in which the choice tasks are described and to place one copy of this block inside the branches along with the choice tasks themselves.

Survey Flow FinalSurvey

The screenshot displays the Survey Flow editor interface. At the top, there is a 'Show Block: Introduction (1 Question)' block. Below it is a 'Randomizer' block with the text 'Randomly present 1 of the following elements' and a checked box for 'Evenly Present Elements'. Underneath the randomizer are two 'Set Embedded Data' blocks: the first sets 'block = 1' and the second sets 'block = 2'. Below these are two 'Then Branch If' blocks. The first branch is 'If block Is Equal to 1' and contains two 'Show Block' elements: 'Pre-experiment questions (1 Question)' and 'CE\_Block1 - Mar 29, 2019 (8 Questions)'. The second branch is 'If block Is Equal to 2' and contains two 'Show Block' elements: 'Pre-experiment questions (1 Question)' and 'CE\_Block2 - Mar 29, 2019 (8 Questions)'. At the bottom, there is a 'Show Block: Post-DCE questions (1 Question)' block. A red arrow points from the 'Pre-experiment questions' block in the 'block = 1' branch to the 'Pre-experiment questions' block in the 'block = 2' branch, illustrating the conditional flow.

### Force Responses

Even though forcing respondents to provide an answer to every question is debatable, it is sometimes desirable to avoid missing values. In Qualtrics, respondents can be forced to provide an answer by ticking the “Force Response” box in the “Validation Options” of a question.

To save some time, it is possible to tick “Force Response” for a batch of questions as follows:

- (1) Click on the first question.
- (2) Hold the “Shift” button on keyboard.
- (3) Click on the last question. All questions between the first and the last will then be selected.
- (4) Tick “Force Response” to apply this option to all selected questions.

### *Testing the Survey and Constructing the Data Set*

Before running the survey with real respondents, it may be useful to test whether all technical elements are correctly configured. To this end, Qualtrics offers the possibility to generate random responses (in “Tools > Review > Generate Test Responses . . .”). Generating a series of random responses will make it possible to detect possible coding mistakes in the survey. Moreover, the test data set can be used to prepare the code to analyze the data even before they are collected. As an example, Stata code (*ShapeQualtricsData.do*) shaping a data set containing 100 test responses (*FinalSurveyData.csv*) is provided in the Supplementary Material.

## **Conclusion**

DCEs have become very popular in the social sciences (see Soekhai et al., 2019). A wide literature discusses the theoretical aspects of DCEs, in particular how to build efficient experimental designs and how to analyze the data collected. Much less has been written concerning the practical implementation of a DCE. In particular, formatting the choice tasks seems an overlooked aspect, which nonetheless constitutes a critical step toward successful implementation of a DCE.

This note fills this gap by providing an exhaustive step-by-step procedure to implement a DCE in Qualtrics survey software. Starting from an experimental design, choice tasks are put in shape using an automated procedure. A working example is presented, and all codes are provided as supplementary material. The content of this note should prove very handy to Qualtrics users who intend to implement surveys that contain DCEs.

## **Appendix**

### *Main Steps to Construct the Qualtrics Survey Used as an Example in This Note*

1. Save all supplementary material in folder “StartFiles” on disk.
2. In Stata:
  - a. Check if the user-written command *texdoc* (Jann, 2016) is already installed, for instance, by typing “which *texdoc.ado*.” If nothing is found, *texdoc* can be installed by typing “*ssc install texdoc*.” The command can also be updated by typing “*ssc install texdoc, replace*.”
  - b. Set the directory to the folder where the start files have been saved (for instance, “*cd C:/Users/StartFiles*”).
  - c. Type “*texdoc do ExpDesign\_to\_Qualtrics*.” The language (EN or FR) will be interactively requested. A TXT file (*DCE\_EN.txt* or *DCE\_FR.txt*) will be created and saved under the current directory. (The two output files *DCE\_EN.txt* and *DCE\_FR.txt* are also available in folder “EndFiles” of the supplementary material.)
3. In Qualtrics:
  - a. Open an existing project or create a new one.
  - b. Import *BaseSurvey.qsf* using “Tools > Import/Export > Import Survey . . .” and then locating the *qsf* file. This will create a new project called *BaseSurvey*, which contains

- the sketch of a survey, with placeholders for introduction, pre-DCE questions, DCE, post-DCE questions, and conclusion.
- c. Import the choice tasks using “Tools > Import/Export > Import Survey . . .” and then locating the TXT file (DCE\_EN.txt or DCE\_FR.txt) created with Stata. This will append the choice tasks to the existing content. Repeat this for both language versions.
  - d. Export the translation files and combine them into the English translation file. Upload the combined translation file, which is available as BaseSurvey\_TranslationFile.txt in folder “EndFiles” of the supplementary material.
  - e. Move the blocks containing the choice tasks to where they should go, between preexperiment questions and postexperiment questions. Remove block “DCE,” which was only a placeholder for the choice tasks. The survey including the DCE, fully translated in English and French, and with randomization implemented is available as FinalSurvey.qsf in folder “EndFiles” of the supplementary material.

### **Data Availability and Software Information**

This article develops a methodology to implement discrete choice experiment in Qualtrics survey software (<https://www.qualtrics.com>). The procedure relies on the statistical software Stata (<https://www.stata.com/>). All Qualtrics and Stata codes allowing to reproduce examples discussed in the article are provided in Supplementary Material.

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### **Supplementary Material**

Supplemental material for this article is available online.

### **Notes**

1. In the context of the Swiss Household Energy Demand Survey (see Weber et al., 2017), we participated in the development of a number of discrete choice experiments (DCEs) and have witnessed these difficulties. The content of this note is based on this experience of successfully implementing around five DCEs per year since 2016 in multilanguage surveys. More generally, the difficulties encountered while implementing experimental designs into Qualtrics are illustrated in the following forum discussions: <https://www.qualtrics.com/community/discussion/755/how-to-make-discrete-choice-experiment-using-the-qualtrics>, <https://www.qualtrics.com/community/discussion/721/custom-design-discrete-choice-experiment-on-qualtrics>
2. The expression “conjoint analysis” is used in Dropp (2014) apparently as a synonym to “DCE.” Differences, however, exist between the two (see Louviere, Flynn, and Carson, 2010).
3. A module to create efficient designs for DCEs is also available as a user-written command in Stata (see Hole, 2015).
4. Although we focus on Qualtrics, it should be mentioned that other survey software tools offer the possibility to import surveys from external files. For instance, it is possible to import a survey from a TXT or CSV file into LimeSurvey ([https://manual.limesurvey.org/Surveys\\_-\\_introduction#Import\\_a\\_survey](https://manual.limesurvey.org/Surveys_-_introduction#Import_a_survey)) and

from a Word document in Sawtooth (<https://www.sawtoothsoftware.com/help/lighthouse-studio/manual/word-import.html>). The procedure described in this note could therefore be applied elsewhere, although subject to syntax adaptations.

5. For details on preparing advanced format TXT files, see Qualtrics support page <https://www.qualtrics.com/support/survey-platform/survey-module/survey-tools/import-and-export-surveys/>
6. Once again, we note that although we focus on Qualtrics, different tools such as LimeSurvey or Sawtooth also allow importing surveys from external files. The procedure described here could therefore be adapted and implemented using different tools.
7. The Stata dofile `ExpDesign_to_Qualtrics.do` provided in the Supplementary Material contains the detailed code for implementing this procedure. Note also that Stata is used here, but alternative tools could be employed instead, provided it is possible to loop over elements and export a TXT file.
8. In case of multilanguage surveys, it is preferable to postpone the relocation of choice tasks after the translation (see Subsection “Translation of the Choice Tasks”).
9. All details concerning the translation tool available in Qualtrics can be found here: <https://www.qualtrics.com/support/survey-platform/survey-module/survey-tools/translate-survey/>.
10. Technically speaking, in Qualtrics, the primary language is the one defined as “Survey Language” in the “Survey Options.”

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