September 15, 2021

How Consumers Make Decisions on Tripadvisor

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Abstract
Numerous scholars have acknowledged the benefits of utilizing stated choice (SC) experiments in the investigation of consumer preferences. Within the realm of tourism and leisure studies, SC experiments have been employed to analyze tourists' inclinations regarding a range of decision-making factors, including destination selection, transportation mode preferences, and options related to destination planning.

INTRODUCTION

When an experiment is designed to produce orthogonal choice sets, the experiment's attributes are statistically independent. This characteristic allows researchers to assess the individual influence of each attribute on the choices observed within the stated choice (SC) experiment (Bliemer & Rose, 2011; Choicemetrics, 2014; Regier, Ryan, Phimister, & Marra, 2007; Rose & Bliemer, 2009). According to Rose and Bliemer (2009), there are three primary reasons why orthogonal designs are frequently employed. Firstly, as mentioned earlier, orthogonal designs yield choice sets with attributes that exhibit little to no correlation, enabling the independent evaluation of each attribute's impact. Secondly, constructing orthogonal designs is relatively straightforward. Lastly, the historical usage and inertia have contributed to the widespread adoption of orthogonal designs in SC experiments. Historically, discrete choice experiments drew heavily from linear models, particularly ANOVA and linear regression models (Addelman, 1962; Green, 1974; Louviere & Woodworth, 1983). Since most SC studies serve practical purposes, there have been limited efforts to compare different design methodologies to identify optimal experiment design practices. Additionally, orthogonal designs have consistently demonstrated satisfactory performance, further reinforcing their prevalence (Bliemer & Rose, 2011).

Despite their popularity, the literature has shown that orthogonal designs often do not maintain orthogonality within the data sets used to estimate discrete choice models (Bliemer & Rose, 2011; Hensher, Milthorpe, Smith, & Barnard, 1990; Rose & Bliemer, 2009). There are several reasons for this loss of orthogonality within the data sets (Rose & Bliemer, 2009). First, when subsets (or blocks) of choice sets are used, as is the case for almost all SC studies because presenting respondents with every possible choice set (a full factorial design) is not feasible in most studies, some correlation will likely occur. This is because it is rare that each block is evenly represented in the final data, in part because each block will realize different response rates. Secondly, when demographic variables such as age, gender and income are added to analysis, as they usually are, correlations often exist between these variables and attributes of the SC experiment. Finally, researchers who have produced choice sets orthogonally often review the final sets to look for situations that are either unrealistic or clearly favorable. In these cases, the choice sets are typically removed from the survey, thus interfering with the orthogonality of the resulting data. For these reasons, although the full set of choice sets produced by orthogonal designs are typically free of correlation between attribute levels, the data generated in these studies usually do have some level of correlation, though it is minimized.

Stated choice (SC) experiments have become the primary means for estimating consumer behavioral preferences or willingness to pay for specific attributes of various goods and services

(Araña, León, Carballo, & Gil, 2016; Bliemer & Rose, 2011; Bliemer, Rose, & Hensher, 2009; Hagmann, Semeijn, & Vellenga, 2015; Lyu & Lee, 2015). In the data collection process for SC experiments, respondents are generally presented with a number of different choice sets, each consisting of alternatives with a set of different attribute levels (Bliemer et al., 2009; Kessels, Goos, & Vandebroek, 2006; Louviere, Hensher, & Swait, 2000; Street & Burgess, 2007), and respondents select their preferred set of alternatives for every choice set. For example, a SC experiment involving a downhill ski area might provide respondents with choices for different levels of attributes such as lift wait time, variety of trail difficulty, terrain park elements, and lift ticket price. In the experiment, subjects would be provided with several sets of choices between two hypothetical ski areas that each offers some mix of attribute levels, and would choose their preferred ski area for each set. Using these choice observations, researchers aim to better understand respondent preferences while taking into consideration the trade-offs consumers make between alternatives.

A primary issue for SC experiments involves the construction of choice situations and the allocation of attribute levels to the design matrix. Traditionally, researchers have relied on the principle of orthogonality to minimize correlations between attribute levels (Rose & Bliemer, 2009) and orthogonal designs are still the most common type of SC experimental design (Barros & Assaf, 2012; Lyu & Lee, 2015; Scarpa & Rose, 2008). Louviere, Hensher and Swait (2000) provide a thorough review of orthogonal designs. In recent years, however, some researchers have criticized the appropriateness of orthogonal designs for SC experiments (e.g., Rose & Bliemer, 2009) and an increasing number of SC experiments have used new methods, such as efficient design, to allocate the attribute levels to the design matrix (Carlsson & Martinsson, 2003; Ferrini & Scarpa, 2007; Kanninen, 2002; Kessels et al., 2006; Rose & Bliemer, 2009). In the tourism and leisure fields, most of the SC modeling studies have used orthogonal designs (see e.g., Albaladejo-Pina & Díaz-Delfa, 2009; Azari et al., 2012; Grigolon et al., 2012; Huybers, 2003; Kelly et al., 2007; Lyu & Lee, 2015; Oh & Ditton, 2006; Oh, Ditton, Gentner, & Riechers, 2005) and relatively few have adopted efficient experimental designs, despite the fact that a number of studies in other fields have recently shown the usefulness of efficient designs for SC experiments (Beck, Fifer, & Rose, 2016; Bliemer & Rose, 2011; Bliemer et al., 2009; Devarasetty, Burris, & Douglass Shaw, 2012). Efficient designs generate data on which model parameters can be estimated with lower expected standard errors. Efficient designs, however, require parameter estimates, which are sometimes unknown unless previous studies or pilot studies have been conducted. Efficient designs also require more computing power, which has, until recent years, been a barrier to using efficient designs to develop choice sets. Today, however, commercial software (e.g., Ngene) is now available and makes the generation of efficient choice sets significantly easier. This paper reviews the literature involving efficient designs and discusses that an SC experiment that generated choice sets with efficient designs would be more appropriate for tourism research using SC modeling.

EFFICIENT DESIGNS

Efficient experiment designs have been discussed in a number of experimental design studies (Beck et al., 2016; Bliemer & Rose, 2011; Bliemer et al., 2009; Kessels et al., 2006; Kessels, Jones, & Goos, 2011; Sándor & Wedel, 2005; Street & Burgess, 2004). Based on these studies, it could be argued that an orthogonal design is appropriate in cases where there is no knowledge about the parameters, but whenever there is any prior parameter information available, efficient designs will outperform orthogonal designs (Bliemer & Rose, 2011; Bliemer et al., 2009; Kessels et al., 2011). Moreover, although orthogonal designs are appropriate when linear models are used for the analysis, most SC studies no longer use linear models for analysis relying instead on logit or probit models (Kessels et al., 2006, 2011; Sándor & Wedel, 2005).

DISCUSSION AND CONCLUSION

Researchers have questioned the use of orthogonal designs in SC experiments in terms of efficiency, and an increasing number of studies have suggested efficient design for SC studies (Araña et al., 2016; Bliemer & Rose, 2011; Bliemer et al., 2009; Devarasetty et al., 2012; Fowkes & Wardman, 1988). One important advantage of efficient designs is that they produce more reliable parameter estimates when prior information is available. The prior information can be obtained from a pilot study or from previous studies that have similar attributes. Moreover, an efficient design for SC studies allows researchers to estimate the parameters with standard errors as low as possible. The efficient design is also commonly known as D-efficient or D-optimal design which is dealing primarily with minimizing the determinant of the asymptotic variance–covariance (AVC) matrix of models and generating more reliable parameter estimates (Bliemer & Rose, 2011; Louviere et al., 2008).

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