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Tourism Choice Model Experiments

by Igor Petrovich & Oleg Stepanov

Abstract

While orthogonal designs have been the preferred option for stated choice studies in the majority of fields, there have been discussions about the advantages of efficient designs in various areas, such as transportation and environmental economics. The growing use of efficient designs in these fields highlights the increasing recognition of their benefits. However, this does not necessarily suggest that orthogonal designs are no longer suitable for SC studies, and this paper is not to criticize the previous studies that have successfully employed orthogonal designs. The emerging literature on efficient design makes a compelling argument for researchers to evaluate whether orthogonal designs align with the objectives and requirements of their specific SC studies. By no means is orthogonal design ruled out as an opportunity, however, researchers are urged to consider an efficient design different from orthogonal as a viable option for their studies.

INTRODUCTION

Researchers have raised questions about the effectiveness of using orthogonal designs in stated choice (SC) experiments, with an increasing body of research suggesting that efficient designs offer advantages (Araña et al., 2016; Bliemer & Rose, 2011; Bliemer et al., 2009; Devarasetty et al., 2012; Fowkes & Wardman, 1988). Efficient designs, in particular, offer enhanced reliability in parameter estimation when prior information is available. This prior knowledge can be acquired from pilot studies or from existing studies with similar characteristics. Furthermore,

efficient SC study designs enable researchers to achieve the lowest possible standard errors in parameter estimation. These designs are commonly referred to as D-efficient or D-optimal designs, primarily focused on minimizing the determinant of the asymptotic variance-covariance (AVC) matrix of models and producing more dependable parameter estimates (Bliemer & Rose, 2011; Louviere et al., 2008).

The concept of efficient experimental designs has been extensively explored in various studies related to experimental design (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 investigations, it can be argued that orthogonal designs are suitable when no prior knowledge of the parameters exists. However, whenever there is available prior parameter information, efficient designs are likely to outperform orthogonal designs (Bliemer & Rose, 2011; Bliemer et al., 2009; Kessels et al., 2011). Moreover, although orthogonal designs may be appropriate when linear models are employed for analysis, most SC studies have shifted away from linear models and now rely on logit or probit models for analysis (Kessels et al., 2006, 2011; Sándor & Wedel, 2005).

DISCUSSION AND CONCLUSION

Methodologies evolve, but robust methodological research is required to help guide that evolution. Orthogonal designs were carried over to SC experimental studies from linear models, and have been used successfully for many years, however a growing number of researchers in other fields have started favoring efficient designs. Despite this growth, the vast majority of SC

experiments conducted in the fields of tourism and leisure have used orthogonal designs.

According to the literature, when used as part of a fractional factorial design, choice sets that were orthogonal when developed often lose their orthogonality by the time the data they produce is analyzed. Efficient designs seem to offer an improved alternative, as they offer the potential for lower confidence intervals for parameters and lower sample sizes. Moreover, the emergence of new software programs allows for the easy development of efficient designs. However, before a widespread shift from orthogonal to efficient designs takes place, further research into the performance of efficient designs is needed.

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