

Accepted Manuscript

Robustness of orthogonal-array based composite designs to missing data

Xue-Ping Chen, Bing Guo, Min-Qian Liu, Xiao-Lei Wang

PII: S0378-3758(17)30188-X
DOI: <https://doi.org/10.1016/j.jspi.2017.10.004>
Reference: JSPI 5608

To appear in: *Journal of Statistical Planning and Inference*

Received date: 28 December 2016
Revised date: 10 October 2017
Accepted date: 11 October 2017

Please cite this article as: Chen X., Guo B., Liu M.-Q., Wang X., Robustness of orthogonal-array based composite designs to missing data. *J. Statist. Plann. Inference* (2017), <https://doi.org/10.1016/j.jspi.2017.10.004>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



Robustness of orthogonal-array based composite designs to missing data

Xue-Ping Chen^{1,2}, Bing Guo¹, Min-Qian Liu¹, Xiao-Lei Wang¹

¹ *LPMC and Institute of Statistics, Nankai University, Tianjin 300071, China*

² *Department of Mathematics, Jiangsu University of Technology, Changzhou, 213001, China*

Abstract

Missing observations can hardly be avoided even by a well-planned experiment. Based on the orthogonal-array based composite designs proposed by Xu et al. (2014), new orthogonal-array based composite minimax loss designs are constructed. Comparisons between the proposed designs and other composite designs, including orthogonal-array based composite designs, augmented pairs designs, augmented pairs minimax loss designs, central composite designs, and small composite designs are made in detail, which show that the new composite designs are more robust to one missing design point in terms of the D -efficiency and generalized scaled standard deviation. Moreover, it is demonstrated that the D -efficiency remains unchanged for both level permutation and column permutation in some special cases.

Keywords: Composite design; D -efficiency; Generalized scaled standard deviation; Minimax loss criterion.

AMS subject Classification: 62K20, 62K15.

1 Introduction

In statistics, missing data is a common occurrence and can have a significant effect on the conclusions drawn from the data. The effect of missing observations can be of particular concern when the design is nearly saturated, saturated, or supersaturated. Many authors have discussed the robustness of statistical designs against missing data. For example, Akhtar and

Download English Version:

<https://daneshyari.com/en/article/7547263>

Download Persian Version:

<https://daneshyari.com/article/7547263>

[Daneshyari.com](https://daneshyari.com)