A Case 3 BWS question consists of three or more profiles. Each profile has two or more attributes with each attribute having two or more levels. Consequently, the profile is expressed as a combination of attribute-levels. Respondents are asked to choose the best and worst profiles from a Case 3 BWS question (i.e., a choice set). This style of question is repeated until all the choice sets are evaluated. There are various approaches to construct the choice sets for Case 3 BWS. We are using a basic design approach with a fractional factorial design (FFD)/orthogonal array (OA) and balanced incomplete block design (BIBD), as explained by Louviere, Flynn, and Marley (2015). This approach creates profiles from an FFD and then assigns the profiles into choice sets using a BIBD. Therefore, the FFD and BIBD used for the approach need to satisfy a condition in which the number of rows of the FFD is equal to the number of treatments in the BIBD.

A modelling approach with discrete choice models will be used to analyse the responses.

The maxdiff model assumes that respondents select profile i as the best and profile j (i ≠j) as the worst because the difference in utility between the two profiles represents the greatest utility difference among all the utility differences. The number of utility differences in a pair is equal to the number of possible pairs in which profile i is selected as the best and profile j is selected as the worst from P profiles, that is, P × (P−1)

4 attributes each at 3 levels.

OA design 9 profiles

A B C D

1 1 1 1

1 2 3 2

1 3 2 3

2 1 3 3

2 2 2 1

2 3 1 2

3 1 2 2

3 2 1 3

3 3 3 1

BIBD design

2 4 5

3 4 9

2 3 6

1 6 9

1 3 5

2 8 9

5 7 9

3 7 8

1 4 8

4 6 7

1 2 7

5 6 8