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Modeling Religious Mobility by UniODA-Based Structural Decomposition

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Analysis assessed structure underlying the cross-classification of religious affiliation of N = 1,995 adults, and their religious affiliation when they were 14 years of age.[1] Typically true when using legacy methods to model mobility applications, no satisfactory linear model was identified, encouraging the authors to comment: "It is difficult to conceive of other models that could shed light on this nominal-by-nominal mobility table, or for that matter, on other square tables of a similar kind."[1] UniODA-based structural decomposition revealed that the stability model (elements fall into the major diagonal of the table) fits the data very well, but the residual sample is too small to justify additional structural models due to insufficient statistical power.

In the first step of UniODA-based structural decomposition[2,3] the *a priori* hypothesis that the religious affiliation is coincident across time[2,3] is tested vis-à-vis the following UniODA[2,3] and MegaODA[4-6] software command syntax (the affiliation "other" was not used because such agglomerations of observations representing different groups can induce paradoxical confounding[2,3,7]):

```
OPEN mobility.dat;
OUTPUT mobility.out;
VARS now at14;
CLASS now;
ATTRIBUTE at 14;
DIRECTIONAL < 1 2 3 4 5 6;
MCARLO ITER 5000;
GO;
```

The classification accuracy yielded by the *a priori* hypothesis was statistically significant ($p < 0.0001$), and it reflected a relatively strong effect[2,3] (*ESS* = 57.7).

To prepare the data set for the second step of the decomposition analysis, in the initial data[1] the correctly classified observations (i.e., the table cells) were set equal to zero, rendering a *residual table* consisting of all misclassified observations: that is, the original table with all elements of the major diagonal set to zero. The residual table provided insufficient statistical power to motivate a secondary structural model: three of the religious affiliation categories had 34 or fewer remaining observations.[2]

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References

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[4]Soltysik RC, Yarnold PR (2013). MegaODA large sample and BIG DATA time trials: Separating the chaff. *Optimal Data Analysis*, *2*, 194-197. URL: http://optimalprediction.com/files/pdf/V2A29.pdf

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Author Notes

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