



Notes and Comments on MDPREF

APMC 13 August 2001 (v2)

MDPREF (MultiDimensional PReference scaling)
provides internal analysis of:

1. **two-way, two-mode *data* of either**
 - ▶ a rectangular, row-conditional matrix or
 - ▶ a set of paired comparisons matrices
 2. **by means of a vector (scalar-products) *model***
 3. **using a linear (metric) *transformation* of the data.**
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1. MDPREF is a Bell Laboratories Program implementing Carroll and Chang's (1970) paper. It provides a SVD (singular-value decomposition) of the scalar-products of the preference ratings data, and gives a "point-vector" representation: the columns (stimuli) as points, and the rows (subjects) as unit-vectors.

Although designed originally for the analysis of sets of dominance pair-comparison data, the predominant use is for the analysis of preference ratings. The option to use pair-comparisons data is still allowed for).

1. **MDSX DOCUMENTATION:**

- ▶ MDS(X) Users Manual, Edinburgh 1981, ch. 5 (*MDPREF_TUM.pdf*)
- ▶ The User' Guide to MDS, Heinemann 1982 ,5.3.2 and 6.2.2
(*MDPREF_TUG532.pdf*, *MDPREF_TUG622.pdf*)
- ▶ Key Texts in multidimensional scaling, 10: Coxon: Mapping of Family Composition preferences: a scaling analysis)
KTMDS_COXON_FamilyComp_Delbeke.jpg

3. ALERT (August 2001) : (MDPREF) **INPUT DATA FORMAT**

There is an inconsistency in The Users Manual with respect to the DATA TYPE parameter values 3 and 4 (Scores). The information on 5.4 is correct, and the information on Figure 1 (5.5) and Input Parameters (5.15) in incorrect, as it reverses the DATA TYPE 3 and DATA TYPE 4 specification. The correct rule is:

- ▶ DATA TYPE (3) The lowest score is used to denote the most preferred object (and hence the highest score represents the least preferred object)
- ▶ DATA TYPE (4) The highest score is used to denote the most preferred object (and hence the lowest score represents the least preferred object)

4. MDSX DATA:

TEST INPUT: (*TESTMDPREF_INP.txt*)

20 Male & Female subjects making preference judgments of family size and composition (derived from their pair-comparisons data) reported in Delbeke 1968) (Self-documenting file)

80 Male & Female subjects making preference judgments of family size and composition (derived from their pair-comparisons data) reported in Delbeke 1968).

See Coxon's re-analysis of Delbeke/Bollen data in Documentation)

TESTOUTPUT: (*TESTMDPREF_OUT.txt*)

5. COMMENTS:

MDPREF is strongly akin to Simple Correspondence Analysis and to Principal Components Analysis, which all use a SVD of the scalar-products matrix, and differ only in pre-processing of the data, and in normalisation of the solution (Weller and Romney 1990). In MDPREF, the row and/or column data can optionally be centred or standardised, and in the solution the row points are projected onto a unit circle. This facilitates the comparison of row-points by reference to column-points (i.e. as projections of stimuli points on to the subject vector), and thus avoids direct comparison of row-column locations (Carroll, Green, Schaffer 1986,7).

6. HINTS:

Widely used program, especially in marketing (for analysing characteristics of brands), and for joint representation of preference rankings/ratings in general. It can also be thought of as a form of profile analysis. The transformation of the row-data can have major consequences for the scaling representation. Initial analysis often reveals a strong dominating "consensus" factor. When removed (by centring or normalisation) , the subject variability increases dramatically. Note that double-centring is equivalent to making a MDPREF analysis a distance analysis.

7. BASIC REFERENCE:

Carroll, J.D. & Chang, J.J How to use MDPREF, a Computer Program for Multidimensional Analysis of Preference Data, Bell Laboratories.

Other:

Weller, S.C & Romney, A.K. (1990) Metric Scaling: Correspondence Analysis, Sage Publications: Quantitative Applications in the Social Sciences series, Volume: 75

Carroll, J.D., Green, P.E. & Schaffer, C.M. (1986) Interpoint comparisons in Correspondence analysis, J Marketing Research, 23, 271-280

(1987) Comparing interpoint distances in correspondence analysis: a clarification, J Marketing Research, 24, 445-450

Delbeke, L (1968) 5 Construction of Preference Spaces: an investigation into the applicability of multidimensional scaling models: Louvain-Leuven: Publications of the University of Louvain

8. STATUS

The algorithm appears to be stable and reliable. Usage: High