



# Notes and Comments on PREFMAP

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**PREFMAP (PREferenceMAPping) provides external analysis of:**

- 1. two-way, two-mode *data* of a rectangular, row-conditional matrix**
  - 2. by means of an hierarchy of distance and vector *models***
  - 3. using both linear (metric) and ordinal (quasi-non-metric) *transformations* of the data.**
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1. This program originates in the Bell Laboratories series (Carroll 1972) as PREFMAP3.20. It takes an externally defined configuration and then fits a set of ranks or ratings into this provided space, according to an hierarchy of models:  
Phase 1: [Most general model ] General Unfolding model  
(individual rotation of reference axes to form the subject's "idiosyncratic" space, followed by individual weights assigned to the axes of that space). Parallel to "IDIOSCAL" in the similarity hierarchy. Generalisation of MD Unfolding (MINI-RSA).  
Phase 2: Weighted Unfolding model (individual weights assigned to common reference axes to form "private" preference space). Parallel to INDSCAL in the similarity hierarchy. Generalisation of MD Unfolding (MINI-RSA).  
Phase 3: Simple Unfolding model. (Individuals represented by single point of maximum ("ideal") or minimum ("pessimal") preference , defined by reference to a single common space. External equivalent of MD unfolding (MINI-RSA)  
Phase 4: Vector model (Individuals represented by a single vector of increasing preference, defined by reference to a single common space.) External equivalent of MDPREF. This was shown by Carroll (1972) to be a special case of the simple distance model, and hence lowest in the hierarchy.

Options exist for using either a linear/metric or ordinal (quasi-nonmetric) transformation of the data, and for producing (rather than providing) the stimulus space (see Hints below).

Either I-scales (preference rank-orderings), or scores/ ratings data can be used.

**2. MDSX DOCUMENTATION:**

MDS(X) Users Manual, Edinburgh 1981, ch. 13 (written by Dr Wijbrandt van Schuur) (*PREFMAP\_TUM.pdf*)

The User's Guide to Multidimensional Scaling, Heinemann 1982 ,5.3.3 and 6.2.3

(*PREFMAP\_TUG75.pdf*)

The User's Guide to Multidimensional Scaling, ch 4

(*INTERPRETINGCONFIGS\_TUG\_Ch4.pdf*)

"Choice of Options in PREFMAP, and other points" by Charles Jones

(*PREFMAP Options.pdf*)

**3. MDSX DATA:**

TEST INPUT:

(1) (*TESTPREFMAP\_INP.txt*)

40 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: *KTMDS\_COXON\_FamilyComp\_Delbeke.jpg*)

TESTOUTPUT:

(1) (*TESTPREFMAP\_OUT.txt*)

This output is voluminous. Check PRINT instructions to reduce it!

**4. COMMENTS:**

PREFMAP is a complex program, with a wide range of options. Pay especial attention to the options concerned with the Quasi-internal analysis (INITIAL); with the KEEP parameter and with Phases and strategies (see 2.3.7 in MDS(X) User Manual, and with the FIT parameter, which specifies the linear/metric or ordinal (quasi-non-metric) transformation, and the latter's primary/secondary stress options.

**5. HINTS:**

i) PREFMAP is a 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.

ii) PREFMAP (especially phases III and IV) is often used as an external property-fitting procedure, akin to PRO-FIT (qv), and is in many ways preferable to it, offering a non-metric option and also allowing the property/ies to be represented as an "ideal point" (Ph III) as well as an "ideal vector" or direction (Ph IV). The use of PREFMAP (and other MDSX programs ) in interpreting configurations is contained in chapter 4 of The User's Guide to Multidimensional Scaling (see Documentation)

iii) The confusions over the DATA-TYPE specification (see MINIRSA\_notes) also occurs in the PREFMAP documentation. The spec in MDS(X) User Manual **IS INCORRECT** – there is no DATA TYPE (0) and the types run from 1 to 4. The MDSX Pocket Guide and Test Input data give the correct specification, which is as follows:

**The four types are as follows:**

<b>DATA TYPE (1)</b>	<b>I-scale input (i). First stimulus is most preferred</b>
<b>DATA TYPE (2)</b>	<b>Reverse I-scale input (ii). First stimulus is least preferred</b>
<b>DATA TYPE (3)</b>	<b>Fixed-score input (iii). High score means high preference</b>
<b>DATA TYPE (4)</b>	<b>Reverse Fixed-score input (iv). High score means low preference</b>

## 6. REFERENCES

### BASIC REFERENCES:

Carroll, J.D. (1972) Individual Differences and Multidimensional Scaling. In R.N. Shepard, A.K. Romney, and S.B. Nerlove (Eds.), Multidimensional Scaling: Theory and Applications in the Behavioral Sciences. Vol. 1, New York: Seminar Press

Carroll, J.D. (1980). Models and methods for multidimensional analysis of preferential choice (or other dominance) data, in E.D.Lantermann & H.Feger (Eds.), Similarity and Choice, 234-289. Bem: Hans Huber.

### Other references

Application to Beer marketing:

<http://www.itjylland.sdu.dk/~marcus/GBPapers/Bitter/BITTER.htm>

For references PREFMAP applications to food research, see

[http://www.rdg.ac.uk/ae/rjl/ae802/prefmap\\_-\\_refs.htm](http://www.rdg.ac.uk/ae/rjl/ae802/prefmap_-_refs.htm)

and the (more personal) thoughts on preference mapping by the same author (Dr Hal MacFie, Reading University) :

[http://www.rdg.ac.uk/ae/rjl/ae802/7\\_-\\_prefmapping.htm](http://www.rdg.ac.uk/ae/rjl/ae802/7_-_prefmapping.htm)

Carroll and Chang's original "How To Use PREFMAP" is reproduced in the PREFMAP documentation from Smith's (commercial) PC-MDS :

<http://marketing.byu.edu/htmlpages/books/pcmds/PREFMAP.html>

## 7. STATUS

As printed on the Output, users should pay attention to the following:

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*****                               W A R N I N G                               *****
*****                               *****
***** THE RESULTS OF PHASE 1 OF PREFMAP ARE KNOWN TO BE SUBOPTIMAL ON OCCASION AND *****
***** IN OTHER CASES ERRORS ARE KNOWN TO OCCUR.  EXAMINE THE RESULTS  CAREFULLY. *****
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