# Notes and Comments on TRISOSCAL

APMC 31 May 2001

**TRISOSCAL (TRIadic Similarities Ordinal SCALing) provides <u>internal</u> analysis of:**

**1. a set of triadic (dis) similarity measures *data***

**2. by means of a (Minkowski) distance *model***

**3. using a monotone *transformation* of the data.**

---

1. This program has its origin in Roskam's MINI-TRI (Michigan-Israel-Netherlands Integrated Triadic Scaling) program (Roskam 1970). TRISOSCAL (referred to as TRISOCAL in some documentation) is the Edinburgh MDSX generalisation of MINI-TRI developed by Prentice (1973) to incorporate a global approach to stress . Triadic data have the advantage of allowing contextual effects to be examined, and are popular among Personal Constructs researchers (Fransella & Bannister 1977). In the past, triadic data were often broken down into "vote-counts" before analysis, and in so doing the crucial information is lost. The program allows for <u>two types</u> of triadic data. Given a triad (A,B,C) ...

    <u>partial order</u> Data question: "Which is the most similar pair of these three objects?" (Suppose the pair {AC} is chosen; although {AB} and {BC} are thus (by implication) both less similar than {AC}, there is no way of deciding distinguishing between them in terms of how relatively similar they are

    <u>complete order</u> Data question: "Which is the most similar pair of these three objects? *and which is the least similar pair*?" (Suppose the pair {AC} is judged most similar and {BC} the least similar. This implies that {AB} lies between the MS and LS pair, and thus that the order of similarity is: {AC} < {AB} <{BC} (This is the ORDER(0) and ORDER(1) distinction in the PARAMETERS).

    <u>local vs global stress</u>. TRISOSCAL implements the MINI-TRI program, but goes on to distinguish between local and global stress in a way that the parent program does not. In brief, <u>local</u> stress allows a given data pair value to be fit by one disparity in one triad, and by a different disparity value in another triad, without contributing to the stress value. By contrast, <u>global stress</u> tries to keep consistency across triads -- although in so doing often increases stress values

considerably (see MDS(X) User Manual reference and *Prentice_Stress.pdf* for details of the distinction and its implementation.

Solutions can also be run in any Minkowski metric (see The User's Guide to Multidimensional Scaling 5.3.3.2). The default is Euclidean metric.

2. **MDSX DOCUMENTATION:**

MDS(X) Users Manual, Edinburgh 1981, ch. 15 (*TRISOSCAL_TUM.pdf)*
The User' Guide to MDS, Heinemann 1982 , 6.1.3 (*TRISOSCAL_TUG613. pdf*)
Technical Appendix T3.1.1 (Triadic Similarities Scaling) in Coxon and Jones (1979) Measurement and Meanings, Heinemann ( *Prentice_Stress.pdf* )

**3. MDSX DATA:**

TEST INPUT: A set of test data (from a single subject) of 52 triads involving 13 occupational titles, using a Balanced Incomplete Block Design with 12 replications of each stimulus, and 2 replications of each pair of stimuli (see Coxon & Jones (1979) Measurement and Meanings, London: Macmillan, pp 33-34) .

(*TESTTRISOSCAL_INP. txt*)

TEST OUTPUT:

(*TESTTRISOSCAL_OUT.txt)*

(The data referring to a single subject, and using global stress, the stress values are characteristically quite low)

4. COMMENTS:

The difference between global and local stress is very considerable, and values of global stress can be in excess of 0.9 when used over a set of subjects! Local stress tolerates a considerable amount of strictly inconsistent data, but Prentice's approach might be considered too restrictive for a mixed set of individuals...

5. HINTS:

... so a sensible strategy is to use the Roskam (local) approach for an initial estimate of an acceptable configuration, then to use the Prentice (global) approach for each individual set of triads, and use PINDIS to reconcile and differentiate individual differences.

6. REFERENCES

BASIC REFERENCE:

Roskam E.E (1970) The method of triads for non-metric MDS, Psychologie, 25, 404-417

Other references

Fransella F, Bannister D (1977) A manual for repertory grid technique. Academic Press, London New York San Francisco

Heiser, W.J. and Bennani M. (1995). Triadic Distance Models for Triadic Dissimiliarity Data. Research Report RR-95-04, Department of Data Theory, University of Leiden; (49 pp.)

7. STATUS

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