MBS 94-19

An equivalence Relation Between Correspondence Analysis and Classical Metric Multidimensional Scaling for the Recovery of Euclidean Distances

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A theorem is proved showing that a special variant of correspondence analysis (CA), like classical two-way metric multidimensional scaling (MMDS), recovers Euclidean distances (asymptotically, as a certain constant grows large) exactly, and in fact yields solutions equivalent up to a similarity transformation to MMDS, even in the case of "noisy" data. Specifically, a slight modification of a use of CA for analysis of proximity data proposed independently by Gifi and by Weller and Romney, which depends on a certain additive constant, k, which should be "large," is shown, as k--, to result in an R-dimensional solution equivalent, up to a scale factor, to that obtained by a certain form of MMDS. It is conjectured that this asymptotic result may account for the apparent success of the closely related "Gifi/Weller/Romney" CA procedure in recovering multidimensional structure underlying proximity data.