

PROGRAM ABSTRACTS/ALGORITHMS

Factor structure comparisons: Two BASIC programs for microprocessors

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Factor structure comparison techniques involve the assessment of the degree to which a particular factor structure matrix derived from one sample is similar to the factor structure matrix derived from a second sample, given that the same variables are employed in each factor analysis. Several reviews of these techniques are available (Levine, 1977; Pinneau & Newhouse, 1964; Please, 1973). This paper reports on two BASIC programs that compute various factor structure comparison indices. FACCOM1 computes the correlations, the root mean squares, and the coefficients of congruence between the factor loadings of the two structure matrices. FACCOM2 calculates the salient variable similarity index between the factor loadings of the two structure matrices.

Input. Both programs initially request the user to specify whether the data will be entered from an already existing data file or from the keyboard. When the data are entered from an already existing data file, the file name is supplied by the user so that the file can be found. Both programs can be used to create this data file. When the data are entered from the keyboard, the number of variables in the two factor matrices is supplied by the user. The order and number of variables in these two matrices need to be equivalent. The program then prompts the user for the number of factors in the two structure matrices. The two factor structure matrices need not have the same number of factors. Given sufficient memory, a maximum of 40 variables and 10 factors in each of the structure matrices is permitted. A matrix label is requested for identification purposes. The factor loadings of each matrix are then individually requested. The user may request that the data be stored to disk in order to circumvent the need to reenter the data with the second program. With the FACCOM2 pro-

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gram, a decision criterion that may range from .01 to .99 must be inputted. The value of .1 is usually employed as the decision criterion (Levine, 1977).

Output. Both programs have options that allow the printing of the original factor structure matrices. For each comparison index, the program will print a matrix of indices that compares each factor in the first structure matrix with each factor in the second structure matrix. An additional summary table is then printed that offers the comparison of the loadings of each respective factor of the two structure matrices (i.e., Factor 1 vs. Factor 1, Factor 2 vs. Factor 2, etc.) and the overall indices of the two matrices. This table will have as many comparisons as the number of factors in the smaller structure matrix. FACCOM1 will offer computations of the correlations of the factor loadings, the root mean squares, and the coefficients of congruence. FACCOM2 prints the salient variable similarity index.

Program Language and Requirements. These two programs were written in LBASIC on a 48K TRS-80 Model I with a single disk drive using a LDOS operating environment. About 11.4K of memory is required to accommodate the FACCOM1 program and a 12-variable problem with four factors in each of the structure matrices. FACCOM2 needs about 10.4K of memory for the same type of problem. The data entry may be entered either from keyboard or disk file, and the output is sent to a printer. Both programs are readily adaptable to other types of systems.

Availability. Both of the programs are available free of charge from the author, Department of Psychology, University of New Hampshire, Durham, New Hampshire 03824.

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