

Program PROFAN—A profile analysis data converter

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Although numerous methods have been suggested for determining groups of subjects with similar psychometric profiles (e.g., Morrison, 1967; Overall & Klett, 1972; & Tatsuoka, 1971), four methods have been enthusiastically recommended by their authors. Each of these methods involve factor analysis of different profile similarity measures.

The first measure employed in profile analysis studies was the product-moment correlation coefficient. In this method, an intercorrelation matrix of profile data was transposed, i.e., the rows (people) and columns (variables) of the matrix were interchanged. Factor analysis of the transposed matrix yielded groups of people rather than groups of variables (Burt, 1937; Stephenson, 1936). However, transpose factor analysis has been criticized because the product-moment correlation standardizes variables as part of its computation, thus equating profiles for both level and dispersion. Acceptable measures of profile similarity should reflect profile differences in level, dispersion, and shape (Nunnally, 1967). The three other profile measures discussed below reflect these three profile characteristics.

Cattell (1949) recommended using r_p which is similar to the product-moment coefficient in that r_p usually ranges between +1.0 and -1.0 and has a mean near zero. It is also a function of the D^2 statistic, but appears to have several advantages over this simple measure of similarity according to Cattell (1949).

Nunnally (1962) criticized extant methods of clustering profiles, particularly transpose factor analysis, on mathematical grounds. According to Nunnally (1967, p. 369) these methods "lack any general algebra, they are indeterminate, and they are computationally messy." He argued that a matrix of sums of raw score cross products (SCP) was the appropriate matrix to factor when one was seeking to group profiles.

Finally, Guertin (1971) extolled the virtues of the Distance Similarity Index (DSI) and offered empirical evidence of the superiority of the DSI over the product-moment correlation coefficient as a profile analysis statistic.

In view of this confusing situation, researchers using profile analysis may wish to compute all three acceptable measures, submit each to factor analysis and rotation procedures, and select the most advantageous measure based on the interpretability of the results. Program PROFAN enables the user to accomplish this.

Language and computer. PROFAN is a CDC FORTRAN program that converts raw or standardized profile data to matrices of the three profile similarity measures, r_p , DSI, and SCP. The PROFAN-generated matrices may then be factor analyzed by appropriate programs in the user's library.

Input. The input values include the number of variables, number of subjects, and a vector of standard deviations (optional). An option may be selected that allows the user to select either 1.0 or the largest column value as communality estimates.

Output. The output includes a listing of the input values and the profile measure matrices. The matrices are also punched on cards so that they may be submitted to factor analysis. Subroutines PRTS and PTMS (Veldman, 1967) are called by PROFAN.

Availability. A listing of PROFAN is available free of charge from Randall M. Parker, PhD, Department of Special Education, University of Texas, Austin, Texas 78712.

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