interactive psychological testing using the SAS system: A SAS program to administer and score the MMPI
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HISTORY

The MMPI was first published in 1943 and is today the most widely used objective personality inventory. When people think of a "psychological test," the MMPI and perhaps the "ink blot" test most often come to mind (Hathaway and McKinley, 1967; Dahlstrom, Welsh, and Dahlstrom, 1972; Dahlstrom and Dahlstrom, 1980; Green, 1972; Hathaway and Meehl, 1951). The MMPI consists of 566 statements to which a patient is to respond with a "true" or "false" with respect to whether the particular statement applies to him or her.

The statements cover a range from physical symptoms to psychiatric and psychological symptoms, as well as a considerable number of questions with no obvious connection to either physical or mental problems.

The construction of the MMPI was completely empirical. Hathaway and McKinley collected, selected, inspected, and wrote approximately 1000 statements regarding personality traits and characteristics, and administered these to a variety of groups of persons.

The groups consisted of a group of "normals" and groups of mental patients homogeneous for a particular diagnosis. The data resulting from administering the questions to these groups were then analyzed, and questions which discriminated between "normals" and each group of patients thus became a "scale" on the MMPI. The MMPI consists of 566 statements to which a patient is to respond with a "true" or "false" with respect to whether the particular statement applies to him or her.

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database, so that we may use them in our data analyses.

For these reasons, we decided to write a computer program to score the MMPI using SAS.

The central task of the program was to perform was to take raw item responses and calculate raw scores, standardized scores (called t-scores), and plot the profile in a standard MMPI plot format. The computer program that we wrote performs these tasks.

The first version of this program assumes that the raw item responses are in a data file and are to be read with a SAS INPUT statement. This statement also reads sex and other identifying information. (It is necessary to know the sex of the subject because some of the scales require a different standardizing transformation for each sex, and the masculinity-femininity scale is calculated completely differently for males and females.)

The computer program produces a listing of the raw scale scores, a listing of the t-scores, and a line printer plot for each observation. This plot is patterned after the standard MMPI profile plot. It also produces using PROC GPLOT a SAS dataset for use on a graphics terminal which produces a SAS/GRAPH plot which closely resembles the standard MMPI profile plot. It is necessary to produce the plots in these forms, as any psychologist trained to interpret the MMPI needs to have the data in this format. This is the format with which the psychologist was trained, and from which he or she can best work.

We also produced a version of the program able to take its input (the raw item responses) interactively directly from a terminal under TSO. It is probably possible to adapt this code for interactive use under CMS, but as we do not have CMS here at MCV, we have not done it. The purpose of this form of input is to allow a subject (one who is reasonably nonpsychotic and can read) to interact directly with the program and enter his or her responses himself or herself. Of course, in the event that the subject cannot read or cannot enter the responses, a nurse, aide, or some other relatively unskilled individual can enter the responses for the subject.

Both versions of the program are capable of saving the responses in a SAS dataset for later analysis.

**DETAILS**

This code consists of six macros:

1. INTPIN: Performs interactive input of the raw data. This macro is used when the user desires to place the raw data in a SAS dataset via interactive input, or when a patient or subject wishes to enter the data interactively.

2. BATPIN: Inputs raw data in batch. This macro assumes that the data are in the format used here at MCV.

3. RAWSCR: Computes raw scores on 4 validity scales and 10 clinical scales from the data. These raw scores are basically sums of the number of items marked in the indicated direction. Some items require a positive response, and some require a negative response for inclusion in the scale.

4. TSCR: Calculates "t-scores" for each subject, based upon the raw scores. These t-scores are an imperfect approximation to a linear transformation based on the original Minnesota "Normal" group, having a mean of 50 and standard deviation of 10.

5. LPLOT: Plots the data on the line printer in a format approximating plots produced by standard scoring services.

6. NICEPLOT: Produces plots of the data on SAS/GRAPH device using PROC GPLOT. These may be saved in a SAS dataset for plotting with PROC GREPLAY.

**MACROS AND INSTRUCTIONS**

%INTPIN;

Performs interactive raw data input.

%BATPIN;

Performs batch raw data input.

%RAWSCR (SAS= SAS dataset, PRINT=print option);

Performs calculation of raw scores.

Options:

SAS:

SAS dataset in which raw scores are to be placed. Default is "RAW".

PRINT = "YES" or "NO", specifies whether raw scores are to be printed.

%TSCR (INDS= input SAS dataset, OUTDS= output SAS dataset, PRINT=print option);

Performs calculation of t-scores.

Options:

INDS:

SAS dataset from which raw scores are to be taken. Default is "RAW".

OUTDS:

SAS dataset into which t-scores are to be placed. Default is "TSCORE".

PRINT = "YES" or "NO". Specifies whether t-scores are to be printed or not.

%LPLOT (INDS= input SAS dataset, BYVARS= by variable);

Produces line printer plots.

Options:

INDS:

SAS input dataset containing t-scores. Default is "TSCORE".

BYVARS:

list of by-variables by which the plots are to be done. This list is needed to make the plots unique. The default is ID. If you have multiple MMPIs per ID, you will need to supply a variable or variables to make the plots unique.
This program is available in listing form by writing to the first author. A tape version is also available, but we will need to charge a nominal fee to pay for the tape, computer time, and graduate student time. We assume no responsibility for the accuracy of the scoring procedures, especially in the event that the MMPI is modified in the future. We will send the program only to qualified mental health professionals, or to persons performing mental health research.

REFERENCES


MINNESOTA MULTIPHASIC PERSONALITY INVENTORY

T-SCORES

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MINNESOTA MULTIPHASIC PERSONALITY INVENTORY

T-SCORE

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SCALE

510
MINNESOTA MULTIPHASIC PERSONALITY INVENTORY
11135 TUESDAY, MARCH 13, 1984
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