BASIC PROGRAMS FOR PREDICTION ANALYSIS OF CROSS CLASSIFICATION

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PREDICTION analysis of cross classifications (PA) is a procedure to test simultaneous point predictions. The method was originally proposed by Hildebrand, Laing, and Rosenthal (1977a, 1977b). Modifications have been discussed that involve both descriptive and inferential measures (Brandtstädter and von Eye, in press; von Eye and Brandtstädter, 1985). PA has mostly been applied in developmental research (cf. Froman and Hubert, 1980). The purpose of the present paper is to describe five versions of BASIC microcomputer programs that perform different versions of PA.

The computational procedures of the programs follow the description in von Eye and Brandtstädter (1985). Except for Program Versions 4 and 5, the second part of Programs 1 and 2 (see below), the binomial test that replaces Hildebrand et al.'s (1977b) z-test approximation, and an additional, more flexible measure of prediction success, these procedures are equivalent to the ones described in Hildebrand et al. (1977b). The program computes expected frequencies using maximum likelihood estimators, performs the binomial test, and determines all descriptive measures.

Description

Input. Five versions of the program are available. Each of these versions is interactive and prompts for size of the matrix, observed

frequencies, and the user must specify the cells that fulfill the prediction (hit cells).

Output. The programs print the matrices of observed and expected frequencies, the matrix of hit and error cells, descriptive measures of prediction success, scope, and precision. The binomial test is performed. Finally, Hildebrand et al.'s (1977b) measure of prediction success is decomposed and descriptive measures are provided for each single prediction.

Version 1. A PA is performed. In addition, a quasi-independence log-linear model is fitted, if *df* > 0. Here, error cells are considered structural zeros.

Version 2. As Version 1; however, the results are displayed at the screen only. This version is particularly useful for users of laptop computers.

Version 3. A PA is performed in which structural zeros can be taken into account in the estimation of expected frequencies. A log-linear model is fitted. This program is available also in a .EXE version (compiled BASIC).

Version 4. A PA is performed as in Version 1. In addition, the user is prompted to identify ranks for the categories of either predictor, the criterion, or both. Then, expected frequencies are estimated, using the algorithm described in Fienberg (1980), and goodness of fit chi-square values are determined. This program is available also in a .EXE version.

Version 5. An unconditional PA is performed. This variant of PA does not analyze implicative predictions. Rather, it analyzes the assumption that a set of cells in a two or higher dimensional contingency table contains more elements than expected by chance.

Program Language and Requirements

A first set of interpreted programs is written in MS GW BASIC. The compiled programs are written in MS compiled BASIC. They all have been implemented on a 272 K Bytes HP110 Portable under DOS 2.11. The programs occupy between approximately 5 K Bytes (Version 1) and approximately 10 K Bytes (Version 4 in .EXE form) of memory. A second set of equivalent versions of the programs is available in Applesoft BASIC. These versions have been implemented on Apple IIe and Apple IIc computers.

Program Availability

A GW BASIC program listing and sample output are available gratis from Alexander von Eye, The Pennsylvania State University,

College of Human Development, S-110 Henderson Humán Develop-
ment Building, University Park, PA 16802. If you send a microdis-
kette (3½ inch), the programs will be copied on this diskette. The
Applesoft programs and sample outputs are available gratis from
Günter Krampen, University of Trier, FB 1–Psychology, Tarforst,
D-5500 Trier, West Germany. If you send a 5¼ inch diskette, the
programs will be copied on this diskette.

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