



## Thresholds

PRELIS computes threshold estimates for ordinal variables. The command

```
ET varlist
```

will make PRELIS estimate the thresholds under the condition that they are all *equal* for all ordinal variables in *varlist* (see Jöreskog, 1990). A test of equal thresholds can be obtained by running PRELIS with and without the ET command and computing the difference in chi-squares for each polychoric correlation. This is useful in panel studies when the variables in *varlist* represent the same ordinal variables measured at different occasions. PRELIS will then estimate the means and the variances of the variables underlying the ordinal variables relative to a common scale for all the variables in *varlist*. The origin and unit of measurement of this common scale is fixed so that the sum of the means is zero and the sum of the variances equals the number of variables in *varlist*. Similarly, by polling the data from several groups, one can estimate the thresholds to be the same over groups. These common thresholds can be saved in a file by writing TH = *filename* on the OU command. Polychoric correlations and means and variances of the variables underlying the ordinal variables can then be estimated for each group separately by including the commands

```
FT = filename varlist1
FT varlist2
FT varlist3
...
...
```

and reading the fixed thresholds from the file *filename*. The first line in this file contains the thresholds that will be assigned to the variables in *varlist1*. The thresholds in the second line in the file will be assigned to the variables in *varlist2*, etc. In most applications, each *varlist* will contain only one variable.

For example,

```
FT = THRESH X2 X4 X5
FT X1 X3
```

will set the thresholds equal for variables X2, X4, and X5 and read the values for these thresholds from the first line in the file THRESH, and then set the thresholds equal for variables X1 and X3 and read the values for these thresholds from the second line in the file THRESH.

Consider the input file **EX10B.PRL** in the **PRELIS Examples** folder. We analyze the 12 variables (six variables at two occasions) and estimate the covariance matrix and the corresponding asymptotic covariance matrix under the condition that the thresholds are equal over time for each of the six variables.

```
EXAMPLE 10B
COMPUTING POLYCHORIC CORRELATION MATRIX AND ASYMPTOTIC COVARIANCE
MATRIX UNDER EQUAL THRESHOLDS FOR EACH VARIABLE OVER TIME
POLITICAL ACTION PANEL DATA FOR USA
DA NI=12 MI=8,9
LA
NOSAY1 VOTING1 COMPLEX1 NOCARE1 TOUCH1 INTERES1
NOSAY2 VOTING2 COMPLEX2 NOCARE2 TOUCH2 INTERES2
RA=PANUSA.RAW FO;(12F1.0)
SC CASE=ODD
CL ALL 1=AS 2=A 3=D 4=DS
ET NOSAY1 NOSAY2
ET VOTING1 VOTING2
ET COMPLEX1 COMPLEX2
ET NOCARE1 NOCARE2
ET TOUCH1 TOUCH2
ET INTERES1 INTERES2
OU MA=CM CM=ANELUSA.CML AC=ANELUSA.ACC
```

Note that:

- The missing values are defined as 8 and 9 on the DA command
- Category labels are defined for all variables on the CL command
- The six ET commands specify that the thresholds are to be equal for each variable over time.

On the OU command,

- MA = CM means that the covariance matrix should be computed,
- CM = ANELUSA.CML means that the covariance matrix should be saved in the file **ANELUSA.CML**,
- AC = ANELUSA.ACC means that the asymptotic covariance matrix should be saved in the file **ANELUSA.ACC**.

Since all variables are ordinal, the covariance matrix has a special meaning. It is a scaled polychoric correlation matrix. PRELIS first estimates the polychoric correlations and the means and standard deviations under equal thresholds and then scales the correlation matrix to a covariance matrix using the estimated standard deviations. This kind of covariance matrix is useful not only in longitudinal studies with ordinal variables, but also in multigroup studies with ordinal variables. See Jöreskog & Aish (1996) for further examples. Formulas will be given in Jöreskog & Sörbom (1996).