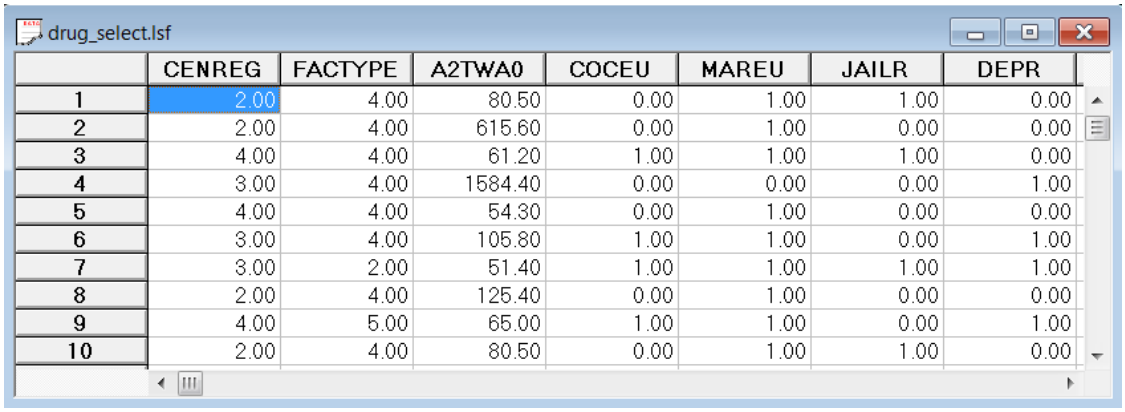
Confirmatory factor analysis model

The data set **drug_select.lsf** in the **Complex survey sample examples** folder forms part of the data library of the Alcohol and Drug Services Study (ADSS). The ADSS is a national study of substance abuse treatment facilities and clients. Background data and data on the substance abuse of a sample of 1752 clients were obtained. The sample was stratified by census region and within each stratum a sample was obtained for each of three facility treatment types within each of the four census regions.



drug_select.lsf

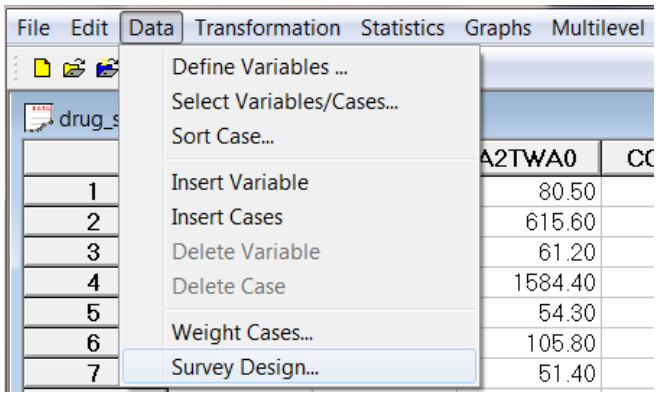
	CENREG	FACTYPE	A2TWA0	COCEU	MAREU	JAILR	DEPR
1	2.00	4.00	80.50	0.00	1.00	1.00	0.00
2	2.00	4.00	615.60	0.00	1.00	0.00	0.00
3	4.00	4.00	61.20	1.00	1.00	1.00	0.00
4	3.00	4.00	1584.40	0.00	0.00	0.00	1.00
5	4.00	4.00	54.30	0.00	1.00	0.00	0.00
6	3.00	4.00	105.80	1.00	1.00	0.00	1.00
7	3.00	2.00	51.40	1.00	1.00	1.00	1.00
8	2.00	4.00	125.40	0.00	1.00	0.00	0.00
9	4.00	5.00	65.00	1.00	1.00	0.00	1.00
10	2.00	4.00	80.50	0.00	1.00	1.00	0.00

The following variables included in the LSF were selected from the survey data:

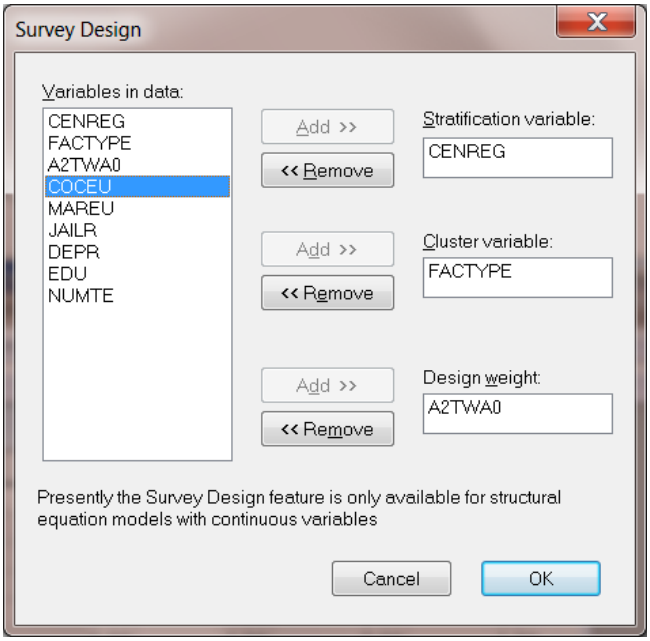
- CENREG: This variable indicates the census region and has four categories, these being "Northeast", "Midwest", "South", and "West" respectively.
- FACTYPE: The facility treatment type has four categories, too, representing facilities with "residential treatment", "outpatient methadone treatment", "outpatient non-methadone treatment", and "more than one type of treatment" respectively.
- COCEU: An indicator variable with value "1" if the respondent has ever used cocaine, and "0" otherwise.
- MAREU: An indicator variable with value "1" if the respondent has ever used marijuana, and "0" otherwise.
- DEPR: This indicator variable is coded "1" if the respondent is depressed, and "0" otherwise.

- EDU: A categorical variable representing the respondent's level of education at admission. It has 5 categories, these being (from 1 to 5) "less than 8 years", "8 – 11 years or less than High School graduate", "High School graduate / GED", "some college", and "college graduate / postgraduate".
- JAILR: This indicator variable indicates whether the respondent had a prison or jail record prior to admission.
- NUMTE: A count variable, indicating the total number of treatment episodes prior to admission.

From the main menu bar, select the **Data, Survey Design …** option.



Add the survey design variables to the appropriate text boxes and select the **File, Save** option to save these changes to the LSF file.



The SIMPLIS syntax file is shown below. The only difference between this and the usual SIMPLIS syntax is the addition of the paragraph

$ADAPQ(12) CLL GR(5)

See the *SIMPLIS Syntax Guide* for a description of the $ADAPQ(n) command and options.

drug_use2.spl

```
Raw Data from file Drug_Select.LSF
$ADAPQ(12) CLL GR(5)
!-------------------------------------------------------------
! Complex survey design example
! CENREC = Stratification variable
! FACTYPE = PSU's (Clusters)
! A2TWA0 = Respondent design weights
! Complimentary log-log link function, 12 quadrature points
!-------------------------------------------------------------
Latent Variables  DrugUse Environm
 COCEU = DrugUse
 MAREU = DrugUse
 JAILR = DrugUse
 DEPR = Environm
 EDU =  Environm
 NUMTE = Environm
LISREL OUTPUT: ND=3
Path Diagram
End of Problem
```

A portion of the LISREL output is shown next.

drug_use2.OUT

```
 LISREL Estimates (Maximum Likelihood)

         LAMBDA-X

             DrugUse   Environm
             --------  --------
    COCEU      1.494       - -
              (0.543)
               2.753

    MAREU      1.447       - -
              (0.150)
               9.672

    JAILR      0.754       - -
              (0.188)
               4.000

     DEPR       - -       0.341
                         (0.102)
                          3.351

      EDU       - -      -0.133
                         (0.082)
                         -1.627

    NUMTE       - -       4.329
                         (1.403)
                          3.086
```

Fit statistics and threshold values are shown below.

drug_use2.OUT

```
Fit Statistic Scale Factor =      0.25240
Number of Strata   =                4
Number of Clusters =               12

Number of quadrature points =             12
Number of free parameters =               17
Number of iterations used =               12

-2lnL (deviance statistic) =      12685.15133
Akaike Information Criterion      12719.15133
Schwarz Criterion                 12806.79307


 Group number:    1
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Threshold estimates and standard deviations
-------------------------------------------
 Threshold             Estimates          S.E.      Est./S.E.

TH1_COCEU               -0.71271        0.27534       -2.58850
TH1_MAREU               -1.89348        0.19715       -9.60421
TH1_JAILR               -0.26159        0.13898       -1.88218
TH1_DEPR                -0.01711        0.08917       -0.19183
TH1_EDU                 -2.85333        0.13439      -21.23152
TH2_EDU                 -1.22371        0.07418      -16.49646
TH3_EDU                  0.07612        0.05627        1.35257
TH1_NUMTE               -2.17273        0.83877       -2.59037
TH2_NUMTE                0.73624        0.17209        4.27818
TH3_NUMTE                3.04317        0.56231        5.41187
```

A path diagram representation of the model fitted to the data is shown below. From the path diagram display it can be seen, for example, that the correlation between the two latent variables equals 0.487.

drug_use2.PTH