

MPLUS Analysis Examples Replication Chapter 10

Mplus includes all input code and output in the *.out file. This document contains selected output from each analysis for Chapter 10. All data preparation and management was done using SAS and then read into Mplus using a text file format produced by SAS.

Some options available in Stata or other software presented in Chapter 10 including Kaplan-Meier curves and the Clog-log logistic model for comparison to the logit model are not available in Mplus. As a result, they not included in this document.

NOTE: Mplus provides parameter estimates that can be transformed to Hazard Ratios by using the exponent of the beta. Confidence intervals can also be calculated manually.

Mplus VERSION 7.4
MUTHEN & MUTHEN
08/02/2017 3:26 PM

INPUT INSTRUCTIONS

TITLE: ASDA 2 EXAMPLE 10.4.5 NCSR DATA SURVIVAL ANALYSIS COX MODEL

! USE CHAPTER 10 DATA SET PREPARED IN SAS

DATA:

FILE IS "P:\ASDA 2\Data sets\NCSR\ncsr_c10_mplus.txt";

VARIABLE:

NAMES ARE

AGE CASEID DSM_SO ED4CAT MAR3CAT MDE_OND NCSRWTLG NCSRWTSH OBESE6CA REGION SECLUSTR

SESTRAT SEX SO_OND WKSTAT3C ag60 ag1829 ag3044 ag4559

ag4cat ageonsetmde ald black ed011 ed12 ed16 ed1315 hisp intwage married

mde ncsrwtsh100 nevmar numsecu other prevmar racecat sexf sexm

white ;

USEVARIABLES ARE sestrat numsecu ncsrwtsh

ageonsetmde mde age sexm prevmar nevmar ed12 ed1315 ed16 hisp black white ;

missing are . ;

WEIGHT IS NCSRWTsh ;

stratification is sestrat ;

cluster is numsecu ;

survival=ageonsetmde (all) ;

timecensored=mde (0=right 1=not) ;

ANALYSIS:

type is complex;

Model:

ageonsetmde on age sexm prevmar nevmar ed12 ed1315 ed16 hisp black white ;

*** WARNING in VARIABLE command

Note that only the first 8 characters of variable names are used in the output.

Shorten variable names to avoid any confusion.

1 WARNING(S) FOUND IN THE INPUT INSTRUCTIONS

ASDA 2 EXAMPLE 10.1 NCSR DATA SURVIVAL ANALYSIS COX MODEL

SUMMARY OF ANALYSIS

Number of groups 1
Number of observations 9282

Number of dependent variables 1
Number of independent variables 10
Number of continuous latent variables 0

Observed dependent variables

Time-to-event (survival)

Non-parametric

AGEONSET

Observed independent variables

AGE	SEXM	PREVMAR	NEVMAR	ED12	ED1315
ED16	HISP	BLACK	WHITE		

Variables with special functions

Stratification SESTRAT
Cluster variable NUMSECU
Weight variable NCSRWTSH

Time-censoring variables

MDE

```

Estimator MLR
Information matrix OBSERVED
Optimization Specifications for the Quasi-Newton Algorithm for
Continuous Outcomes
  Maximum number of iterations 100
  Convergence criterion 0.100D-05
Optimization Specifications for the EM Algorithm
  Maximum number of iterations 500
  Convergence criteria
    Loglikelihood change 0.100D-02
    Relative loglikelihood change 0.100D-05
    Derivative 0.100D-02
Optimization Specifications for the M step of the EM Algorithm for
Categorical Latent variables
  Number of M step iterations 1
  M step convergence criterion 0.100D-02
  Basis for M step termination ITERATION
Optimization Specifications for the M step of the EM Algorithm for
Censored, Binary or Ordered Categorical (Ordinal), Unordered
Categorical (Nominal) and Count Outcomes
  Number of M step iterations 1
  M step convergence criterion 0.100D-02
  Basis for M step termination ITERATION
  Maximum value for logit thresholds 15
  Minimum value for logit thresholds -15
  Minimum expected cell size for chi-square 0.100D-01
Maximum number of iterations for H1 2000
Convergence criterion for H1 0.100D-03
Optimization algorithm EMA
Integration Specifications
  Type STANDARD
  Number of integration points 15
  Dimensions of numerical integration 0
  Adaptive quadrature ON
Base Hazard OFF
Cholesky OFF

```

Input data file(s)

```

P:\ASDA 2\Data sets\NCSR\ncsr_c10_mplus.txt
Input data format FREE

```

SUMMARY OF DATA

```

Number of strata 42
Number of clusters 84

```

COVARIANCE COVERAGE OF DATA

Minimum covariance coverage value 0.100

THE MODEL ESTIMATION TERMINATED NORMALLY

MODEL FIT INFORMATION

Number of Free Parameters 10

Loglikelihood

```

HO Value -10578.163
HO Scaling Correction Factor 1.1498
for MLR

```

Information Criteria

```

Akaike (AIC) 21176.327
Bayesian (BIC) 21247.685
Sample-Size Adjusted BIC 21215.906
(n* = (n + 2) / 24)

```

MODEL RESULTS

	Estimate	S.E.	Est./S.E.	Two-Tailed P-Value
AGEONSETMD ON				
AGE	-0.050	0.002	-20.802	0.000
SEXM	-0.454	0.062	-7.280	0.000
PREVMAR	0.502	0.060	8.371	0.000
NEVMAR	0.081	0.089	0.908	0.364
ED12	-0.057	0.067	-0.848	0.396
ED1315	0.046	0.058	0.787	0.431
ED16	-0.090	0.064	-1.417	0.157
HISP	-0.250	0.134	-1.860	0.063
BLACK	-0.479	0.149	-3.216	0.001
WHITE	0.078	0.117	0.662	0.508

QUALITY OF NUMERICAL RESULTS

Condition Number for the Information Matrix 0.870E-04
 (ratio of smallest to largest eigenvalue)

CONFIDENCE INTERVALS OF MODEL RESULTS

	Lower .5%	Lower 2.5%	Lower 5%	Estimate	Upper 5%	Upper 2.5%	Upper .5%
AGEONSET ON							
AGE	-0.056	-0.054	-0.053	-0.050	-0.046	-0.045	-0.043
SEXM	-0.614	-0.576	-0.556	-0.454	-0.351	-0.331	-0.293
PREVMAR	0.348	0.385	0.404	0.502	0.601	0.620	0.657
NEVMAR	-0.148	-0.093	-0.066	0.081	0.227	0.255	0.309
ED12	-0.230	-0.188	-0.167	-0.057	0.053	0.075	0.116
ED1315	-0.104	-0.068	-0.050	0.046	0.141	0.159	0.195
ED16	-0.254	-0.215	-0.195	-0.090	0.015	0.035	0.074
HISP	-0.596	-0.513	-0.471	-0.250	-0.029	0.013	0.096
BLACK	-0.863	-0.771	-0.724	-0.479	-0.234	-0.187	-0.095
WHITE	-0.225	-0.152	-0.115	0.078	0.271	0.308	0.380

DIAGRAM INFORMATION

Use View Diagram under the Diagram menu in the Mplus Editor to view the diagram.
 If running Mplus from the Mplus Diagrammer, the diagram opens automatically.

Diagram output

p:\asda 2\analysis example replication\mplus\chapter 9\asda 2 section 10.4.5 cox model.dgm

Beginning Time: 15:26:47
 Ending Time: 15:26:49
 Elapsed Time: 00:00:02

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INPUT INSTRUCTIONS

TITLE: ASDA 2 EXAMPLE 10.2 DISCRETE TIME LOGISTIC MODEL

! USE CHAPTER 10 DISCRETE TIME DATA SET PREPARED IN SAS

DATA:

FILE IS "P:\ASDA 2\Data sets\NCSR\ncsr_c10dt_mplus.txt";

VARIABLE:

NAMES ARE

AGE CASEID DSM_SO ED4CAT MAR3CAT MDE_OND NCSRWTLG NCSRWTSH OBESE6CA REGION

SECLUSTR SESTRAT SEX

SO_OND WKSTAT3C ag60 ag1829 ag3044 ag4559

ag4cat ageonsetmde ald black ed011 ed12 ed16 ed1315 hisp intwage married

mde mdetv ncsrwtsh100

nevmr numsecu other prevmar pyr racecat

sexf sexm white ;

USEVARIABLES ARE numsecu mdetv pyr age sexm ed12 ed1315 ed16 hisp

black white prevmar nevmr ageonsetmde ;

missing are . ;

WEIGHT IS ncsrwtsh ;

stratification is sestrat ;

cluster is numsecu ;

SUBPOPULATION =(PYR <= AGEONSETMDE) ;

categorical = mdetv ;

ANALYSIS:

type is complex;

estimator=mlr ;

Model:

mdetv on pyr age sexm ed12 ed1315 ed16 hisp black white prevmar nevmr ;

*** WARNING in VARIABLE command

Note that only the first 8 characters of variable names are used in the output.

Shorten variable names to avoid any confusion.

*** WARNING in MODEL command

Variable is uncorrelated with all other variables: AGEONSETMDE

*** WARNING in MODEL command

At least one variable is uncorrelated with all other variables in the model.

Check that this is what is intended.

3 WARNING(S) FOUND IN THE INPUT INSTRUCTIONS

ASDA 2 EXAMPLE 10.2 DISCRETE TIME LOGISTIC MODEL

SUMMARY OF ANALYSIS

Number of groups	1
Number of observations	385696
Number of dependent variables	2
Number of independent variables	11
Number of continuous latent variables	0

Observed dependent variables

Continuous
AGEONSETMD

Binary and ordered categorical (ordinal)
MDETV

Observed independent variables

PYR	AGE	SEXM	ED12	ED1315	ED16
HISP	BLACK	WHITE	PREVMAR	NEVMAR	

Variables with special functions

Stratification SESTRAT

```

Cluster variable      NUMSECU
Weight variable      NCSRWTSH

Estimator                      MLR
Information matrix              OBSERVED
Optimization Specifications for the Quasi-Newton Algorithm for
Continuous Outcomes
  Maximum number of iterations      100
  Convergence criterion              0.100D-05
Optimization Specifications for the EM Algorithm
  Maximum number of iterations      500
  Convergence criteria
    Loglikelihood change              0.100D-02
    Relative loglikelihood change      0.100D-05
    Derivative                          0.100D-02
Optimization Specifications for the M step of the EM Algorithm for
Categorical Latent variables
  Number of M step iterations        1
  M step convergence criterion        0.100D-02
  Basis for M step termination        ITERATION
Optimization Specifications for the M step of the EM Algorithm for
Censored, Binary or Ordered Categorical (Ordinal), Unordered
Categorical (Nominal) and Count Outcomes
  Number of M step iterations        1
  M step convergence criterion        0.100D-02
  Basis for M step termination        ITERATION
  Maximum value for logit thresholds  15
  Minimum value for logit thresholds -15
  Minimum expected cell size for chi-square  0.100D-01
Maximum number of iterations for H1      2000
Convergence criterion for H1            0.100D-03
Optimization algorithm                  EMA
Integration Specifications
  Type                                STANDARD
  Number of integration points          15
  Dimensions of numerical integration    0
  Adaptive quadrature                   ON
Link                                    LOGIT
Cholesky                                OFF

```

```

Input data file(s)
  P:\ASDA 2\Data sets\NCSR\ncsr_c10dt_mplus.txt
Input data format  FREE

```

SUMMARY OF DATA

```

Number of missing data patterns      1
Number of y missing data patterns    1
Number of u missing data patterns    1
Number of strata                      42
Number of clusters                    84

```

UNIVARIATE PROPORTIONS AND COUNTS FOR CATEGORICAL VARIABLES

```

MDETV
  Category 1    0.995    383921.918
  Category 2    0.005    1774.082

```

THE MODEL ESTIMATION TERMINATED NORMALLY

MODEL FIT INFORMATION

Number of Free Parameters 14

Loglikelihood

```

HO Value          -1690195.042
HO Scaling Correction Factor  18.1004
for MLR

```

Information Criteria

Akaike (AIC) 3380418.084
 Bayesian (BIC) 3380570.163
 Sample-Size Adjusted BIC 3380525.671
 (n* = (n + 2) / 24)

MODEL RESULTS

	Estimate	S.E.	Est./S.E.	Two-Tailed P-Value
MDETV ON				
PYR	0.033	0.002	15.816	0.000
AGE	-0.058	0.002	-23.823	0.000
SEXM	-0.445	0.062	-7.142	0.000
ED12	-0.020	0.066	-0.305	0.761
ED1315	0.093	0.057	1.618	0.106
ED16	-0.019	0.063	-0.307	0.759
HISP	-0.248	0.135	-1.843	0.065
BLACK	-0.457	0.150	-3.049	0.002
WHITE	0.074	0.118	0.626	0.531
PREVMAR	0.494	0.061	8.101	0.000
NEVMAR	-0.035	0.088	-0.402	0.688
Means				
AGEONSETMD	50.356	0.370	136.029	0.000
Thresholds				
MDETV\$1	3.436	0.162	21.209	0.000
Variances				
AGEONSETMD	354.439	7.689	46.095	0.000

LOGISTIC REGRESSION ODDS RATIO RESULTS

MDETV ON	
PYR	1.033
AGE	0.943
SEXM	0.641
ED12	0.980
ED1315	1.097
ED16	0.981
HISP	0.780
BLACK	0.633
WHITE	1.077
PREVMAR	1.639
NEVMAR	0.965

QUALITY OF NUMERICAL RESULTS

Condition Number for the Information Matrix 0.412E-05
 (ratio of smallest to largest eigenvalue)

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