

ภาคผนวก ข
ตัวอย่างผลการวิเคราะห์ข้อมูล
โปรแกรมการวิเคราะห์ HLM

Program: HLM 6 Hierarchical Linear and Nonlinear Modeling
Authors: Stephen Raudenbush, Tony Bryk, & Richard Congdon
Publisher: Scientific Software International, Inc. (c) 2000
techsupport@ssicentral.com
www.ssicentral.com

Module: HLM2.EXE (6.03.26284.1)
Date: 6 July 2010, Tuesday
Time: 22:49:58

SPECIFICATIONS FOR THIS HLM2 RUN

Problem Title: no title

The data source for this run = meta
The command file for this run = whlmtemp.hlm
Output file name = C:\Documents and Settings\nan\Desktop\HLM\hlm2.txt
The maximum number of level-1 units = 780
The maximum number of level-2 units = 37
The maximum number of iterations = 100
Method of estimation: restricted maximum likelihood

Weighting Specification

Weight
Variable
Weighting? Name Normalized?
Level 1 no
Level 2 no
Precision no

The outcome variable is RC

The model specified for the fixed effects was:

Level-1 Level-2
Coefficients Predictors

INTRCPT1, B0 INTRCPT2, G00
#% T_INTER slope, B1 INTRCPT2, G10
#% DTYPE_IV slope, B2 INTRCPT2, G20
#% DTYPESTA slope, B3 INTRCPT2, G30

'#' - The residual parameter variance for this level-1 coefficient has been set to zero.

'%' - This level-1 predictor has been centered around its grand mean.

The model specified for the covariance components was:

Sigma squared (constant across level-2 units)

Tau dimensions

INTRCPT1

Summary of the model specified (in equation format)

Level-1 Model

$$Y = B0 + B1*(T_INTER) + B2*(DTYPE_IV) + B3*(DTYPESTA) + R$$

Level-2 Model

$$B0 = G00 + U0$$

$$B1 = G10$$

$$B2 = G20$$

$$B3 = G30$$

Iterations stopped due to small change in likelihood function

***** ITERATION 6 *****

Sigma_squared = 0.03355

Tau

INTRCPT1,B0 0.06066

Tau (as correlations)

INTRCPT1,B0 1.000

Random level-1 coefficient Reliability estimate

INTRCPT1, B0 0.947

The value of the likelihood function at iteration 6 = 1.497628E+002

The outcome variable is RC

Final estimation of fixed effects:

Fixed Effect	Standard Coefficient	Error	Approx. T-ratio	d.f.	P-value
--------------	----------------------	-------	-----------------	------	---------

For	INTRCPT1, B0					
	INTRCPT2, G00	0.197687	0.042115	4.694	36	0.000
For	T_INTER slope, B1					
	INTRCPT2, G10	0.019130	0.056602	0.338	776	0.735
For	DTYPE_IV slope, B2					
	INTRCPT2, G20	-0.289844	0.048781	-5.942	776	0.000
For	DTYPESTA slope, B3					
	INTRCPT2, G30	0.194977	0.024583	7.931	776	0.000

The outcome variable is RC

Final estimation of fixed effects
(with robust standard errors)

Fixed Effect	Standard Coefficient	Standard Error	Approx. T-ratio	d.f.	P-value	
For	INTRCPT1, B0					
	INTRCPT2, G00	0.197687	0.042903	4.608	36	0.000
For	T_INTER slope, B1					
	INTRCPT2, G10	0.019130	0.039969	0.479	776	0.632
For	DTYPE_IV slope, B2					
	INTRCPT2, G20	-0.289844	0.111406	-2.602	776	0.010
For	DTYPESTA slope, B3					
	INTRCPT2, G30	0.194977	0.046764	4.169	776	0.000

Final estimation of variance components:

Random Effect	Standard Deviation	Variance Component	df	Chi-square	P-value
INTRCPT1, U0	0.24628	0.06066	36	1236.25316	0.000
level-1, R	0.18317	0.03355			

Statistics for current covariance components model

Deviance = -299.525620
Number of estimated parameters = 2

Program: HLM 6 Hierarchical Linear and Nonlinear Modeling
Authors: Stephen Raudenbush, Tony Bryk, & Richard Congdon
Publisher: Scientific Software International, Inc. (c) 2000
techsupport@ssicentral.com
www.ssicentral.com

Module: HLM2.EXE (6.03.26284.1)
Date: 7 July 2010, Wednesday
Time: 10:58: 5

SPECIFICATIONS FOR THIS HLM2 RUN

Problem Title: no title

The data source for this run = hypo

The command file for this run = whlmtemp.hlm

Output file name = C:\Documents and Settings\nan\Desktop\HLM\hlm2.txt

The maximum number of level-1 units = 780

The maximum number of level-2 units = 37

The maximum number of iterations = 100

Method of estimation: restricted maximum likelihood

Weighting Specification

Weight
Variable
Weighting? Name Normalized?
Level 1 no
Level 2 no
Precision no

The outcome variable is RC

The model specified for the fixed effects was:

Level-1 Level-2
Coefficients Predictors

 INTRCPT1, B0 INTRCPT2, G00
\$ NTPAG, G01
\$ DOCOM, G02
\$ NUMDV, G03
\$ N_STA4, G04
\$ NTOOL, G05
\$ DINST, G06
#% DTYPE_IV slope, B1 INTRCPT2, G10
#% DYPESTA slope, B2 INTRCPT2, G20

'#' - The residual parameter variance for this level-1 coefficient has been set to zero.

'%' - This level-1 predictor has been centered around its grand mean.

'\$' - This level-2 predictor has been centered around its grand mean.

The model specified for the covariance components was:

Sigma squared (constant across level-2 units)

Tau dimensions
INTRCPT1

Summary of the model specified (in equation format)

Level-1 Model

$$Y = B0 + B1*(DTYPE_IV) + B2*(DTYPESTA) + R$$

Level-2 Model

$$\begin{aligned} B0 &= G00 + G01*(NTPAG) + G02*(DOCOM) + G03*(NUMDV) + G04*(N_STA4) \\ &+ G05*(NTOOL) + G06*(DINST) + U0 \\ B1 &= G10 \\ B2 &= G20 \end{aligned}$$

Iterations stopped due to small change in likelihood function

***** ITERATION 7 *****

Sigma_squared = 0.03350

Tau

INTRCPT1,B0 0.05266

Tau (as correlations)

INTRCPT1,B0 1.000

Random level-1 coefficient Reliability estimate

INTRCPT1, B0 0.939

The value of the likelihood function at iteration 7 = 1.356364E+002

The outcome variable is RC

Final estimation of fixed effects:

Fixed Effect	Coefficient	Standard Error	Approx. T-ratio	d.f.	P-value

For INTRCPT1, B0					
INTRCPT2, G00	0.193970	0.039190	4.949	30	0.000
NTPAG, G01	0.000367	0.000580	0.632	30	0.532
DOCOM, G02	0.228045	0.087796	2.597	30	0.015
NUMDV, G03	-0.018555	0.037474	-0.495	30	0.624
N_STA4, G04	-0.000189	0.000421	-0.449	30	0.656
NTOOL, G05	0.026429	0.025313	1.044	30	0.305
DINST, G06	0.074789	0.100163	0.747	30	0.461
For DTYPE_IV slope, B1					
INTRCPT2, G10	-0.273638	0.049050	-5.579	771	0.000
For DTYPESTA slope, B2					
INTRCPT2, G20	0.199027	0.024595	8.092	771	0.000

The robust standard errors cannot be computed for this model.

Final estimation of variance components:

Random Effect	Standard Deviation	Variance Component	df	Chi-square	P-value

INTRCPT1, U0	0.22949	0.05266	30	1148.76320	0.000
level-1, R	0.18304	0.03350			

Statistics for current covariance components model

 Deviance = -271.272871
 Number of estimated parameters = 2