ภาคผนวก

- ผลการวิเคราะห์องค์ประกอบเชิงยืนยันของแบบทดสอบวัดศักยภาพทางการเรียนอุดมศึกษา ของมหาวิทยาลัยสงขลานครินทร์เป็นรายด้าน โดยใช้โปรแกรมลิสเรล (LISREL 8.72) ดังนี้

  1.แสดงผลการวิเคราะห์องค์ประกอบเชิงยืนยันอันดับแรกในแต่ละตัวแปรขององค์ประกอบความสามารถด้านภาษา

  2. แสดงผลการวิเคราะห์องค์ประกอบเชิงยืนยันอันดับสองในแต่ละตัวแปรขององค์ประกอบความสามารถด้านภาษา

  3. แสดงผลการวิเคราะห์องค์ประกอบเชิงยืนยันอันดับแรกในแต่ละตัวแปรขององค์ประกอบความสามารถด้านเหตุผล

  4. แสดงผลการวิเคราะห์องค์ประกอบเชิงยืนยันอันดับสองในแต่ละตัวแปรขององค์ประกอบความสามารถด้านเหตุผล

  5. แสดงผลการวิเคราะห์องค์ประกอบเชิงยืนยันอันดับแรกในแต่ละตัวแปรขององค์ประกอบความสามารถด้านจำนวน

  6. แสดงผลการวิเคราะห์องค์ประกอบเชิงยืนยันอันดับสองในแต่ละตัวแปรขององค์ประกอบความสามารถด้านจำนวน

  7. แสดงผลการวิเคราะห์องค์ประกอบเชิงยืนยันอันดับแรกในแต่ละตัวแปรขององค์ประกอบความสามารถด้านคิดวิเคราะห์

  8. แสดงผลการวิเคราะห์องค์ประกอบเชิงยืนยันอันดับสองในแต่ละตัวแปรขององค์ประกอบความสามารถด้านคิดวิเคราะห์

- หนังสือขอความอนุเคราะห์ในการเก็บข้อมูลเพื่อการวิจัย
- ประวัติผู้เขียน

ผลการวิเคราะห์องค์ประกอบเชิงยืนยันของแบบทดสอบวัดศักยภาพทางการเรียนอุดมศึกษา
ของมหาวิทยาลัยสงขลานครินทร์เป็นรายด้าน โดยใช้โปรแกรมลิสเรล (LISREL 8.72)

1. แสดงผลการวิเคราะห์องค์ประกอบเชิงยืนยันอันดับแรกในแต่ละตัวแปรขององค์ประกอบความสามารถด้านภาษา

DATE: 8/11/2009
TIME: 0:21

L I S R E L 8.72

BY

Karl G. J”reskog & Dag S”rbom

The following lines were read from file C:\f1\f1.LPJ:

```
TI f1
f1path
!DA NI=25 NO=1000 MA=CM
SY='C:\f1\f1.dsf' NG=1
MO NX=25 NK=1 TD=SY
LK
f1
FR LX(1,1) LX(2,1) LX(3,1) LX(4,1) LX(5,1) LX(6,1) LX(7,1) LX(8,1)
LX(9,1)
FR LX(10,1) LX(11,1) LX(12,1) LX(13,1) LX(14,1) LX(15,1) LX(16,1)
LX(17,1) LX(18,1)
FR LX(19,1) LX(20,1) LX(21,1) LX(22,1) LX(23,1) LX(24,1) LX(25,1)
PD
OU AM AD=OFF
```

TI f1

Number of Input Variables 25
Number of Y - Variables 0
Number of X - Variables 25
Number of ETA - Variables 0
Number of KSI - Variables 1
Number of Observations 1000

TI f1

Covariance Matrix

	a1	a2	a3	a4	a5	a6
a1	0.24					
a2	0.00	0.18				
a3	0.01	-0.01	0.10			
a4	0.00	0.00	0.00	0.19		
a5	-0.01	0.01	0.01	0.01	0.24	
a6	0.00	-0.01	0.00	0.00	0.00	0.10
a7	0.00	0.00	0.00	0.01	0.01	0.01
a8	-0.01	0.00	0.00	0.00	0.01	0.01
a9	0.00	-0.01	0.00	0.00	0.00	0.00
a10	0.01	0.00	0.00	0.00	0.01	0.00
a11	0.00	0.00	0.00	0.00	0.00	0.00
a12	0.01	0.00	0.00	0.01	0.00	0.00
a13	-0.01	0.00	0.00	0.00	0.00	0.00
a14	0.01	0.00	-0.01	0.00	0.00	0.00
a15	0.00	0.00	0.00	0.00	0.00	0.00
a16	0.00	0.00	0.00	0.01	0.01	0.01
a17	-0.01	0.01	0.01	0.02	0.02	0.01
a18	0.01	0.00	-0.01	0.00	-0.04	-0.01
a19	0.01	-0.01	-0.01	-0.01	-0.01	0.00
a20	-0.02	0.00	0.00	0.00	0.00	0.00
a21	0.02	-0.01	0.00	0.01	0.00	0.00
a22	0.01	0.01	-0.01	0.00	-0.02	0.00
a23	0.00	0.00	0.00	0.00	0.00	0.00
a24	0.01	0.00	0.00	0.01	0.00	0.00
a25	-0.01	0.00	0.01	0.00	0.01	0.00

Covariance Matrix

	a7	a8	a9	a10	a11	a12
a7	0.20					
a8	0.00	0.13				
a9	0.00	0.00	0.12			
a10	0.00	0.00	0.00	0.09		
a11	0.00	0.00	0.00	0.00	0.06	
a12	0.01	0.00	0.00	0.00	0.00	0.08
a13	0.01	0.01	0.00	0.00	0.00	0.01
a14	-0.01	-0.01	0.00	0.00	0.00	0.00
a15	0.00	0.00	0.00	0.00	0.00	0.01
a16	0.00	0.00	0.00	0.00	-0.01	0.00
a17	0.01	0.00	0.01	0.00	0.00	0.00
a18	-0.02	0.00	0.00	-0.01	0.00	-0.01
a19	-0.01	0.00	0.01	0.00	0.01	0.00
a20	0.01	0.01	0.01	0.00	0.01	0.01
a21	-0.01	-0.01	0.00	-0.01	0.00	0.00
a22	-0.02	0.00	-0.01	0.00	0.00	0.00
a23	0.00	0.00	0.00	0.00	0.00	0.00
a24	0.01	0.00	0.00	0.00	0.00	0.00
a25	0.00	0.00	0.00	0.00	0.00	0.00

Covariance Matrix

	a13	a14	a15	a16	a17	a18
a13	0.07					

		a14	0.00	0.16		
	a15	0.00	0.00	0.05		
a16	0.00	0.00	0.00	0.11		
a17	0.02	0.00	0.00	0.01	0.21	
a18	-0.01	0.01	-0.01	0.00	0.00	0.22
a19	0.00	0.00	0.00	-0.01	-0.01	0.00
a20	0.01	-0.01	0.00	0.01	0.00	-0.02
a21	-0.01	0.00	0.00	-0.01	-0.02	0.02
a22	-0.01	0.01	0.00	-0.01	-0.02	0.03
a23	0.00	0.00	0.00	0.00	0.00	0.00
a24	0.01	0.00	0.00	0.00	0.00	-0.01
a25	0.00	0.00	0.00	0.00	0.01	-0.01

Covariance Matrix

	a19	a20	a21	a22	a23	a24
a19	0.15					
a20	-0.01	0.20				
a21	0.00	-0.01	0.24			
a22	0.00	-0.01	0.01	0.23		
a23	0.00	0.00	0.00	0.01	0.09	
a24	0.00	0.01	0.00	0.00	0.00	0.13
a25	-0.01	0.01	0.00	0.00	0.00	0.01

Covariance Matrix

	a25
a25	0.16

TI f1

Parameter Specifications

LAMBDA-X

	f1
a1	1
a2	2
a3	3
a4	4
a5	5
a6	6
a7	7
a8	8
a9	9
a10	10
a11	11
a12	12
a13	13
a14	14
a15	15
a16	16
a17	17
a18	18

a19	19
a20	20
a21	21
a22	22
a23	23
a24	24
a25	25

THETA-DELTA

a1	a2	a3	a4	a5	a6
26	27	28	29	30	31

THETA-DELTA

a7	a8	a9	a10	a11	a12
32	33	34	35	36	37

THETA-DELTA

a13	a14	a15	a16	a17	a18
38	39	40	41	42	43

THETA-DELTA

a19	a20	a21	a22	a23	a24
44	45	46	47	48	49

THETA-DELTA

a25
50

TI f1

Number of Iterations = 14

LISREL Estimates (Maximum Likelihood)

LAMBDA-X

	f1
a1	0.05
	(0.02)
	2.26
a2	0.00
	(0.02)
	0.09

a3	-0.04
	(0.01)
	-2.54
a4	-0.05
	(0.02)
	-2.34
a5	-0.13
	(0.02)
	-5.56
a6	-0.04
	(0.02)
	-2.78
a7	-0.09
	(0.02)
	-4.47
a8	-0.04
	(0.02)
	-2.41
a9	-0.02
	(0.02)
	-1.35
a10	-0.02
	(0.01)
	-1.61
a11	0.00
	(0.01)
	-0.44
a12	-0.06
	(0.01)
	-4.43
a13	-0.08
	(0.01)
	-6.11
a14	0.04
	(0.02)
	2.24
a15	-0.04
	(0.01)
	-4.46
a16	-0.04
	(0.02)

-2.28

a17 -0.11
(0.02)
-5.07

a18 0.19
(0.02)
8.10

a19 0.04
(0.02)
2.05

a20 -0.08
(0.02)
-3.83

a21 0.10
(0.02)
4.49

a22 0.13
(0.02)
5.80

a23 0.01
(0.01)
0.49

a24 -0.03
(0.02)
-2.03

a25 -0.02
(0.02)
-1.01

PHI

f1
1.00

THETA-DELTA

a1	a2	a3	a4	a5	a6
0.24	0.18	0.10	0.18	0.22	0.10
(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.00)
22.05	22.35	21.97	22.03	20.35	21.89

THETA-DELTA

a7	a8	a9	a10	a11	a12
0.19	0.13	0.12	0.09	0.06	0.07
(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)
21.11	22.00	22.24	22.20	22.34	21.13

THETA-DELTA

a13	a14	a15	a16	a17	a18
0.07	0.16	0.04	0.11	0.19	0.19
(0.00)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)
19.87	22.05	21.12	22.04	20.72	17.29

THETA-DELTA

a19	a20	a21	a22	a23	a24
0.15	0.20	0.23	0.21	0.09	0.13
(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)
22.10	21.46	21.09	20.15	22.34	22.11

THETA-DELTA

a25
0.16
(0.01)
22.29

Squared Multiple Correlations for X - Variables

a1	a2	a3	a4	a5	a6
0.01	0.00	0.01	0.01	0.07	0.02

Squared Multiple Correlations for X - Variables

a7	a8	a9	a10	a11	a12
0.04	0.01	0.00	0.01	0.00	0.04

Squared Multiple Correlations for X - Variables

a13	a14	a15	a16	a17	a18
0.08	0.01	0.04	0.01	0.06	0.16

Squared Multiple Correlations for X - Variables

a19	a20	a21	a22	a23	a24

0.01 0.03 0.04 0.08 0.00 0.01

Squared Multiple Correlations for X - Variables

a25
0.00

Goodness of Fit Statistics

Degrees of Freedom = 275
Minimum Fit Function Chi-Square = 343.09 (P = 0.0033)
Normal Theory Weighted Least Squares Chi-Square = 338.41 (P = 0.0054)
Estimated Non-centrality Parameter (NCP) = 63.41
90 Percent Confidence Interval for NCP = (20.83 ; 114.16)

Minimum Fit Function Value = 0.34
Population Discrepancy Function Value (F0) = 0.063
90 Percent Confidence Interval for F0 = (0.021 ; 0.11)
Root Mean Square Error of Approximation (RMSEA) = 0.015
90 Percent Confidence Interval for RMSEA = (0.0087 ; 0.020)
P-Value for Test of Close Fit (RMSEA < 0.05) = 1.00

Expected Cross-Validation Index (ECVI) = 0.44
90 Percent Confidence Interval for ECVI = (0.40 ; 0.49)
ECVI for Saturated Model = 0.65
ECVI for Independence Model = 0.64

Chi-Square for Independence Model with 300 Degrees of Freedom = 590.84
Independence AIC = 640.84
Model AIC = 438.41
Saturated AIC = 650.00
Independence CAIC = 788.53
Model CAIC = 733.79
Saturated CAIC = 2570.02

Normed Fit Index (NFI) = 0.42
Non-Normed Fit Index (NNFI) = 0.74
Parsimony Normed Fit Index (PNFI) = 0.38
Comparative Fit Index (CFI) = 0.77
Incremental Fit Index (IFI) = 0.78
Relative Fit Index (RFI) = 0.37

Critical N (CN) = 969.11

Root Mean Square Residual (RMR) = 0.0046
Standardized RMR = 0.031
Goodness of Fit Index (GFI) = 0.97
Adjusted Goodness of Fit Index (AGFI) = 0.97
Parsimony Goodness of Fit Index (PGFI) = 0.82

TI f1

Modification Indices and Expected Change

No Non-Zero Modification Indices for LAMBDA-X

No Non-Zero Modification Indices for PHI

Modification Indices for THETA-DELTA

	a1	a2	a3	a4	a5	a6
a1				- -		
a2			0.27		- -	
a3		2.52		2.37		- -
a4		0.13	0.44		0.45	- -
a5		0.07	1.24	0.48		0.02	- -
a6	1.35	2.13	0.09	0.07	0.02	- -
a7	0.03	0.17	0.05	0.44	0.19	1.26
a8	0.63	0.00	2.37	0.00	0.45	4.88
a9	0.15	3.68	0.63	0.71	0.14	2.01
a10	5.50	1.24	0.99	0.31	1.75	1.25
a11	1.27	0.02	0.38	0.06	0.00	0.08
a12	7.48	1.26	0.06	0.54	1.04	3.86
a13	0.41	0.84	4.31	1.08	5.50	1.10
a14	1.04	0.38	2.94	0.00	0.12	0.20
a15	0.16	0.04	0.17	0.16	0.10	0.06
a16	1.78	0.13	1.31	1.25	0.69	2.13
a17	0.86	0.92	0.24	5.30	1.51	0.17
a18	0.54	0.08	0.13	0.64	5.55	1.45
a19	0.93	1.89	2.00	1.16	1.72	0.04
a20	3.95	0.04	0.69	0.23	2.75	0.00
a21	6.02	3.74	0.01	3.49	2.81	0.00
a22	0.29	3.81	0.36	0.21	0.00	0.22
a23	0.13	0.66	0.42	0.59	0.19	0.54
a24	5.97	0.02	0.46	5.78	3.10	0.25
a25	1.62	0.15	5.30	0.43	0.73	1.29

Modification Indices for THETA-DELTA

	a7	a8	a9	a10	a11	a12
a7				- -		
a8			2.92		- -	
a9		0.61		0.70		- -
a10		1.52	0.07		1.10	- -
a11		0.00	0.01	1.46		0.34	- -
a12	0.57	2.20	0.80	2.26	4.70	- -
a13	0.47	1.49	0.95	0.07	0.06	3.84
a14	0.23	0.96	0.85	0.08	1.00	0.02
a15	2.73	1.29	0.05	1.54	1.17	19.61
a16	0.04	0.11	0.29	2.70	4.27	0.31
a17	0.16	0.12	3.44	0.12	0.10	3.12
a18	0.04	0.79	0.55	0.08	1.46	0.45
a19	0.12	1.31	3.81	0.63	4.89	0.11
a20	0.05	0.35	0.55	0.37	2.53	0.03
a21	0.22	0.97	0.35	0.55	1.09	0.47
a22	0.83	0.09	0.63	1.04	1.31	1.10
a23	0.12	0.00	0.07	0.72	0.29	0.09
a24	2.69	0.18	0.40	0.20	0.00	1.48
a25	0.11	1.54	0.22	0.26	0.88	0.78

Modification Indices for THETA-DELTA

	a13	a14	a15	a16	a17	a18
a13	- -					
a14	0.49	- -				
a15	0.04	1.32	- -			
a16	0.48	1.88	1.58	- -		
a17	4.39	0.45	1.87	1.23	- -	
a18	0.03	0.32	0.30	2.54	11.58	- -
a19	0.74	0.15	0.00	1.36	1.57	3.40
a20	0.07	0.53	1.43	3.32	0.71	1.51
a21	2.70	1.39	0.06	0.13	1.89	0.18
a22	0.07	1.10	0.73	4.43	0.28	0.21
a23	2.75	1.52	3.16	2.52	0.78	0.78
a24	1.47	0.08	0.01	0.83	0.89	2.09
a25	0.67	0.19	3.18	0.81	1.45	0.14

Modification Indices for THETA-DELTA

	a19	a20	a21	a22	a23	a24
a19	- -					
a20	1.70	- -				
a21	0.00	0.13	- -			
a22	0.53	0.14	0.43	- -		
a23	0.34	0.34	1.21	4.41	- -	
a24	0.37	0.64	0.32	2.45	0.16	- -
a25	2.89	0.43	0.37	1.67	0.74	2.76

Modification Indices for THETA-DELTA

	a25
a25	- -

Expected Change for THETA-DELTA

	a1	a2	a3	a4	a5	a6
a1	- -					
a2	0.00	- -				
a3	0.01	-0.01	- -			
a4	0.00	0.00	0.00	- -		
a5	0.00	0.01	0.00	0.00	- -	
a6	0.01	-0.01	0.00	0.00	0.00	- -
a7	0.00	0.00	0.00	0.00	0.00	0.01
a8	0.00	0.00	-0.01	0.00	0.00	0.01
a9	0.00	-0.01	0.00	0.00	0.00	0.00
a10	0.01	0.00	0.00	0.00	0.01	0.00
a11	0.00	0.00	0.00	0.00	0.00	0.00
a12	0.01	0.00	0.00	0.00	0.00	-0.01
a13	0.00	0.00	-0.01	0.00	-0.01	0.00
a14	0.01	0.00	-0.01	0.00	0.00	0.00
a15	0.00	0.00	0.00	0.00	0.00	0.00
a16	0.01	0.00	0.00	0.01	0.00	0.00
a17	-0.01	0.01	0.00	0.01	0.01	0.00

a18	-0.01	0.00	0.00	0.01	-0.02	-0.01
a19	0.01	-0.01	-0.01	-0.01	-0.01	0.00
a20	-0.01	0.00	0.00	0.00	-0.01	0.00
a21	0.02	-0.01	0.00	0.01	0.01	0.00
a22	0.00	0.01	0.00	0.00	0.00	0.00
a23	0.00	0.00	0.00	0.00	0.00	0.00
a24	0.01	0.00	0.00	0.01	-0.01	0.00
a25	-0.01	0.00	0.01	0.00	0.01	0.00

Expected Change for THETA-DELTA

	a7	a8	a9	a10	a11	a12
a7	- -					
a8	-0.01	- -				
a9	0.00	0.00	- -			
a10	-0.01	0.00	0.00	- -		
a11	0.00	0.00	0.00	0.00	- -	
a12	0.00	0.00	0.00	0.00	0.00	- -
a13	0.00	0.00	0.00	0.00	0.00	0.00
a14	0.00	0.00	0.00	0.00	0.00	0.00
a15	-0.01	0.00	0.00	0.00	0.00	0.01
a16	0.00	0.00	0.00	-0.01	-0.01	0.00
a17	0.00	0.00	0.01	0.00	0.00	-0.01
a18	0.00	0.01	0.00	0.00	0.00	0.00
a19	0.00	0.01	0.01	0.00	0.01	0.00
a20	0.00	0.00	0.00	0.00	0.01	0.00
a21	0.00	-0.01	0.00	0.00	0.00	0.00
a22	-0.01	0.00	0.00	0.00	0.00	0.00
a23	0.00	0.00	0.00	0.00	0.00	0.00
a24	0.01	0.00	0.00	0.00	0.00	0.00
a25	0.00	-0.01	0.00	0.00	0.00	0.00

Expected Change for THETA-DELTA

	a13	a14	a15	a16	a17	a18
a13	- -					
a14	0.00	- -				
a15	0.00	0.00	- -			
a16	0.00	0.01	0.00	- -		
a17	0.01	0.00	0.00	0.01	- -	
a18	0.00	0.00	0.00	0.01	0.03	- -
a19	0.00	0.00	0.00	0.00	-0.01	-0.01
a20	0.00	0.00	0.00	0.01	-0.01	-0.01
a21	-0.01	-0.01	0.00	0.00	-0.01	0.00
a22	0.00	0.01	0.00	-0.01	0.00	0.00
a23	0.00	0.00	0.00	0.00	0.00	0.00
a24	0.00	0.00	0.00	0.00	0.00	-0.01
a25	0.00	0.00	0.00	0.00	0.01	0.00

Expected Change for THETA-DELTA

	a19	a20	a21	a22	a23	a24
a19	- -					
a20	-0.01	- -				
a21	0.00	0.00	- -			

a22	0.00	0.00	-0.01	- -		
a23	0.00	0.00	-0.01	0.01	- -	
a24	0.00	0.00	0.00	0.01	0.00	- -
a25	-0.01	0.00	0.00	0.01	0.00	0.01

Expected Change for THETA-DELTA

	a25
a25	- -

Maximum Modification Index is 19.61 for Element (15,12) of THETA-DELTA

Time used: 0.109 Seconds

DATE: 10/13/2009
TIME: 20:44

L I S R E L 8.72

BY

Karl G. J”reskog & Dag S”rbom

TI f1

Covariance Matrix

	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10
a1	0.24									
a2	0.00	0.18								
a3	0.01	-0.01	0.10							
a4	0.00	0.00	0.00	0.19						
a5	-0.01	0.01	0.01	0.01	0.24					
a6	0.00	-0.01	0.00	0.00	0.00	0.10				
a7	0.00	0.00	0.00	0.01	0.01	0.01	0.20			
a8	-0.01	0.00	0.00	0.00	0.01	0.01	0.00	0.13		
a9	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.12	

a10	0.01	0.00	0.00	0.00	0.01	0.00
	0.00	0.00	0.00	0.09		
a11	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00		
a12	0.01	0.00	0.00	0.01	0.00	0.00
	0.01	0.00	0.00	0.00		
a13	-0.01	0.00	0.00	0.00	0.00	0.00
	0.01	0.01	0.00	0.00		
a14	0.01	0.00	-0.01	0.00	0.00	0.00
	-0.01	-0.01	0.00	0.00		
a15	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00		
a16	0.00	0.00	0.00	0.01	0.01	0.01
	0.00	0.00	0.00	0.00		
a17	-0.01	0.01	0.01	0.02	0.02	0.01
	0.01	0.00	0.01	0.00		
a18	0.01	0.00	-0.01	0.00	-0.04	-0.01
	-0.02	0.00	0.00	-0.01		
a19	0.01	-0.01	-0.01	-0.01	-0.01	0.00
	-0.01	0.00	0.01	0.00		
a20	-0.02	0.00	0.00	0.00	0.00	0.00
	0.01	0.01	0.01	0.00		
a21	0.02	-0.01	0.00	0.01	0.00	0.00
	-0.01	-0.01	0.00	-0.01		
a22	0.01	0.01	-0.01	0.00	-0.02	0.00
	-0.02	0.00	-0.01	0.00		
a23	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00		
a24	0.01	0.00	0.00	0.01	0.00	0.00
	0.01	0.00	0.00	0.00		
a25	-0.01	0.00	0.01	0.00	0.01	0.00
	0.00	0.00	0.00	0.00		

Covariance Matrix

a11	a12	a13	a14	a15	a16	a17
		a18	a19	a20		
---	---	---	---	---	---	---
		---	---	---	---	

		a11	0.06			
	a12	0.00	0.08			
a13	0.00	0.01	0.07			
a14	0.00	0.00	0.00	0.16		
a15	0.00	0.01	0.00	0.00	0.05	
a16	-0.01	0.00	0.00	0.00	0.00	0.11
a17	0.00	0.00	0.02	0.00	0.00	0.01
			0.21			
a18	0.00	-0.01	-0.01	0.01	-0.01	0.00
			0.00	0.22		
a19	0.01	0.00	0.00	0.00	0.00	-0.01
		-0.01	0.00	0.15		
a20	0.01	0.01	0.01	-0.01	0.00	0.01
	0.00	-0.02	-0.01	0.20		
a21	0.00	0.00	-0.01	0.00	0.00	-0.01
	-0.02	0.02	0.00	-0.01		
a22	0.00	0.00	-0.01	0.01	0.00	-0.01
	-0.02	0.03	0.00	-0.01		

a23	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00		
a24	0.00	0.00	0.01	0.00	0.00	0.00
	0.00	-0.01	0.00	0.01		
a25	0.00	0.00	0.00	0.00	0.00	0.00
	0.01	-0.01	-0.01	0.01		

Covariance Matrix

	a21	a22	a23	a24	a25
a21			0.24		
a22		0.01	0.23		
a23	0.00	0.01	0.09		
a24	0.00	0.00	0.00	0.13	
a25	0.00	0.00	0.00	0.01	0.16

TI f1

Number of Iterations = 2

LISREL Estimates (Maximum Likelihood)

Measurement Equations

a1 = 0.052*f1, Errorvar.= 0.24 , R8 = 0.011
(0.023) (0.011)
2.26 22.05

a2 = 0.0018*f1, Errorvar.= 0.18 , R8 = 0.00
(0.020) (0.0082)
0.088 22.35

a3 = - 0.038*f1, Errorvar.= 0.100 , R8 = 0.014
(0.015) (0.0045)
-2.54 21.97

a4 = - 0.047*f1, Errorvar.= 0.18 , R8 = 0.012
(0.020) (0.0084)
-2.34 22.03

a5 = - 0.13*f1, Errorvar.= 0.22 , R8 = 0.069
(0.023) (0.011)
-5.56 20.35

a6 = - 0.042*f1, Errorvar.= 0.10 , R8 = 0.017
(0.015) (0.0046)
-2.78 21.89

a7 = - 0.094*f1, Errorvar.= 0.19 , R8 = 0.044
(0.021) (0.0091)
-4.47 21.11

a8 = - 0.041*f1, Errorvar.= 0.13 , R8 = 0.013
(0.017) (0.0059)
-2.41 22.00

a9 = - 0.022*f1, Errorvar.= 0.12 , R8 = 0.0040
(0.016) (0.0053)
-1.35 22.24

a10 = - 0.022*f1, Errorvar.= 0.087 , R8 = 0.0057
(0.014) (0.0039)
-1.61 22.20

a11 = - 0.0050*f1, Errorvar.= 0.060 , R8 = 0.00042
(0.011) (0.0027)
-0.44 22.34

a12 = - 0.058*f1, Errorvar.= 0.073 , R8 = 0.044
(0.013) (0.0034)
-4.43 21.13

a13 = - 0.079*f1, Errorvar.= 0.067 , R8 = 0.085
(0.013) (0.0034)
-6.11 19.87

a14 = 0.042*f1, Errorvar.= 0.16 , R8 = 0.011
(0.019) (0.0073)
2.24 22.05

a15 = - 0.045*f1, Errorvar.= 0.044 , R8 = 0.044
(0.010) (0.0021)
-4.46 21.12

a16 = - 0.035*f1, Errorvar.= 0.11 , R8 = 0.011
(0.016) (0.0049)
-2.28 22.04

a17 = - 0.11*f1, Errorvar.= 0.19 , R8 = 0.057
(0.021) (0.0093)
-5.07 20.72

a18 = 0.19*f1, Errorvar.= 0.19 , R8 = 0.16
(0.023) (0.011)
8.10 17.29

a19 = 0.037*f1, Errorvar.= 0.15 , R8 = 0.0092
(0.018) (0.0067)
2.05 22.10

a20 = - 0.081*f1, Errorvar.= 0.20 , R8 = 0.032
(0.021) (0.0092)
-3.83 21.46

a21 = 0.10*f1, Errorvar.= 0.23 , R8 = 0.045
(0.023) (0.011)
4.49 21.09

a22 = 0.13*f1, Errorvar.= 0.21 , R8 = 0.076
(0.023) (0.011)
5.80 20.15

a23 = 0.0069*f1, Errorvar.= 0.088 , R8 = 0.00053
(0.014) (0.0040)
0.49 22.34

a24 = - 0.034*f1, Errorvar.= 0.13 , R8 = 0.0091
(0.017) (0.0058)
-2.03 22.11

a25 = - 0.019*f1, Errorvar.= 0.16 , R8 = 0.0022
(0.019) (0.0072)
-1.01 22.29

Correlation Matrix of Independent Variables

f1

1.00

Goodness of Fit Statistics

Degrees of Freedom = 275
Minimum Fit Function Chi-Square = 343.09 (P = 0.0033)
Normal Theory Weighted Least Squares Chi-Square = 338.41 (P = 0.0054)
Chi-Square Difference with 0 Degree of Freedom = 0.00 (P = 1.00)
Estimated Non-centrality Parameter (NCP) = 63.41
90 Percent Confidence Interval for NCP = (20.83 ; 114.16)

Minimum Fit Function Value = 0.34
Population Discrepancy Function Value (F0) = 0.063
90 Percent Confidence Interval for F0 = (0.021 ; 0.11)
Root Mean Square Error of Approximation (RMSEA) = 0.015
90 Percent Confidence Interval for RMSEA = (0.0087 ; 0.020)
P-Value for Test of Close Fit (RMSEA < 0.05) = 1.00

Expected Cross-Validation Index (ECVI) = 0.44
90 Percent Confidence Interval for ECVI = (0.40 ; 0.49)
ECVI for Saturated Model = 0.65
ECVI for Independence Model = 0.64

Chi-Square for Independence Model with 300 Degrees of Freedom = 590.84
Independence AIC = 640.84
Model AIC = 438.41
Saturated AIC = 650.00
Independence CAIC = 788.53
Model CAIC = 733.79
Saturated CAIC = 2570.02

Normed Fit Index (NFI) = 0.42
Non-Normed Fit Index (NNFI) = 0.74
Parsimony Normed Fit Index (PNFI) = 0.38
Comparative Fit Index (CFI) = 0.77
Incremental Fit Index (IFI) = 0.78
Relative Fit Index (RFI) = 0.37

Critical N (CN) = 969.11

Root Mean Square Residual (RMR) = 0.0046
Standardized RMR = 0.031
Goodness of Fit Index (GFI) = 0.97
Adjusted Goodness of Fit Index (AGFI) = 0.97
Parsimony Goodness of Fit Index (PGFI) = 0.82

The Modification Indices Suggest to Add an Error Covariance

Between	and	Decrease in Chi-Square	New Estimate
a15	a12	19.6	0.01
a18	a17	11.6	0.03

Time used: 0.188 Seconds

2. แสดงผลการวิเคราะห์องค์ประกอบเชิงยืนยันอันดับสองในแต่ละตัวแปรขององค์ประกอบความสามารถด้านภาษา

DATE: 10/13/2009
TIME: 21:34

L I S R E L 8.72

BY

Karl G. J”reskog & Dag S”rbom

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The following lines were read from file D:\จาก desktop\ครั้งที่ 2\f1\f1.SPJ:

```
TI f1
f1path
SYSTEM FILE from file 'C:\f1\f1.dsf'
Sample Size = 1000
Latent Variables  f1
Relationships
a1 = f1
a2 = f1
a3 = f1
a4 = f1
a5 = f1
a6 = f1
a7 = f1
a8 = f1
a9 = f1
a10 = f1
a11 = f1
a12 = f1
a13 = f1
a14 = f1
a15 = f1
a16 = f1
a17 = f1
a18 = f1
a19 = f1
a20 = f1
a21 = f1
a22 = f1
a23 = f1
a24 = f1
a25 = f1
Set the Variance of f1 to 1.00
Set the Error Covariance of a3 and a1 Free
Set the Error Covariance of a3 and a2 Free
Set the Error Covariance of a6 and a2 Free
Set the Error Covariance of a8 and a6 Free
Set the Error Covariance of a9 and a2 Free
Set the Error Covariance of a10 and a1 Free
Set the Error Covariance of a12 and a1 Free
Set the Error Covariance of a12 and a7 Free
Set the Error Covariance of a12 and a10 Free
Set the Error Covariance of a12 and a11 Free
Set the Error Covariance of a13 and a3 Free
Set the Error Covariance of a13 and a5 Free
Set the Error Covariance of a13 and a12 Free
Set the Error Covariance of a14 and a3 Free
Set the Error Covariance of a15 and a12 Free
Set the Error Covariance of a16 and a6 Free
Set the Error Covariance of a16 and a8 Free
Set the Error Covariance of a16 and a11 Free
Set the Error Covariance of a17 and a4 Free
Set the Error Covariance of a18 and a6 Free
Set the Error Covariance of a18 and a12 Free
Set the Error Covariance of a18 and a17 Free
Set the Error Covariance of a19 and a9 Free
Set the Error Covariance of a19 and a11 Free
Set the Error Covariance of a19 and a18 Free
```

Set the Error Covariance of a20 and a1 Free
Set the Error Covariance of a20 and a5 Free
Set the Error Covariance of a20 and a11 Free
Set the Error Covariance of a20 and a16 Free
Set the Error Covariance of a21 and a1 Free
Set the Error Covariance of a21 and a5 Free
Set the Error Covariance of a22 and a2 Free
Set the Error Covariance of a22 and a16 Free
Set the Error Covariance of a23 and a15 Free
Set the Error Covariance of a23 and a22 Free
Set the Error Covariance of a24 and a1 Free
Set the Error Covariance of a24 and a4 Free
Set the Error Covariance of a24 and a5 Free
Set the Error Covariance of a24 and a7 Free
Set the Error Covariance of a25 and a3 Free
Set the Error Covariance of a25 and a15 Free
Set the Error Covariance of a25 and a19 Free
Set the Error Covariance of a25 and a24 Free
Path Diagram
End of Problem

Sample Size = 1000

TI f1

Covariance Matrix

	a1	a2	a3	a4	a5	a6
a1	0.24					
a2	0.00	0.18				
a3	0.01	-0.01	0.10			
a4	0.00	0.00	0.00	0.19		
a5	-0.01	0.01	0.01	0.01	0.24	
a6	0.00	-0.01	0.00	0.00	0.00	0.10
a7	0.00	0.00	0.00	0.01	0.01	0.01
a8	-0.01	0.00	0.00	0.00	0.01	0.01
a9	0.00	-0.01	0.00	0.00	0.00	0.00
a10	0.01	0.00	0.00	0.00	0.01	0.00
a11	0.00	0.00	0.00	0.00	0.00	0.00
a12	0.01	0.00	0.00	0.01	0.00	0.00
a13	-0.01	0.00	0.00	0.00	0.00	0.00
a14	0.01	0.00	-0.01	0.00	0.00	0.00
a15	0.00	0.00	0.00	0.00	0.00	0.00
a16	0.00	0.00	0.00	0.01	0.01	0.01
a17	-0.01	0.01	0.01	0.02	0.02	0.01
a18	0.01	0.00	-0.01	0.00	-0.04	-0.01
a19	0.01	-0.01	-0.01	-0.01	-0.01	0.00
a20	-0.02	0.00	0.00	0.00	0.00	0.00
a21	0.02	-0.01	0.00	0.01	0.00	0.00
a22	0.01	0.01	-0.01	0.00	-0.02	0.00
a23	0.00	0.00	0.00	0.00	0.00	0.00
a24	0.01	0.00	0.00	0.01	0.00	0.00
a25	-0.01	0.00	0.01	0.00	0.01	0.00

Covariance Matrix

	a7	a8	a9	a10	a11	a12

			a7	0.20		
		a8	0.00	0.13		
	a9	0.00	0.00	0.12		
a10	0.00	0.00	0.00	0.00	0.09	
a11	0.00	0.00	0.00	0.00	0.06	
a12	0.01	0.00	0.00	0.00	0.00	0.08
a13	0.01	0.01	0.00	0.00	0.00	0.01
a14	-0.01	-0.01	0.00	0.00	0.00	0.00
a15	0.00	0.00	0.00	0.00	0.00	0.01
a16	0.00	0.00	0.00	0.00	-0.01	0.00
a17	0.01	0.00	0.01	0.00	0.00	0.00
a18	-0.02	0.00	0.00	-0.01	0.00	-0.01
a19	-0.01	0.00	0.01	0.00	0.01	0.00
a20	0.01	0.01	0.01	0.00	0.01	0.01
a21	-0.01	-0.01	0.00	-0.01	0.00	0.00
a22	-0.02	0.00	-0.01	0.00	0.00	0.00
a23	0.00	0.00	0.00	0.00	0.00	0.00
a24	0.01	0.00	0.00	0.00	0.00	0.00
a25	0.00	0.00	0.00	0.00	0.00	0.00

Covariance Matrix

a13	a14	a15	a16	a17	a18
		a13	0.07		
	a14	0.00	0.16		
a15	0.00	0.00	0.05		
a16	0.00	0.00	0.00	0.11	
a17	0.02	0.00	0.00	0.01	0.21
a18	-0.01	0.01	-0.01	0.00	0.00	0.22
a19	0.00	0.00	0.00	-0.01	-0.01	0.00
a20	0.01	-0.01	0.00	0.01	0.00	-0.02
a21	-0.01	0.00	0.00	-0.01	-0.02	0.02
a22	-0.01	0.01	0.00	-0.01	-0.02	0.03
a23	0.00	0.00	0.00	0.00	0.00	0.00
a24	0.01	0.00	0.00	0.00	0.00	-0.01
a25	0.00	0.00	0.00	0.00	0.01	-0.01

Covariance Matrix

a19	a20	a21	a22	a23	a24
		a19	0.15		
	a20	-0.01	0.20		
a21	0.00	-0.01	0.24		
a22	0.00	-0.01	0.01	0.23	
a23	0.00	0.00	0.00	0.01	0.09	
a24	0.00	0.01	0.00	0.00	0.00	0.13
a25	-0.01	0.01	0.00	0.00	0.00	0.01

Covariance Matrix

	a25
a25	0.16

TI f1

Number of Iterations = 20

LISREL Estimates (Maximum Likelihood)

Measurement Equations

a1 = 0.059*f1, Errorvar.= 0.24 , R8 = 0.015
(0.023) (0.011)
2.62 21.98

a2 = - 0.027*f1, Errorvar.= 0.18 , R8 = 0.0039
(0.019) (0.0082)
-1.38 22.26

a3 = - 0.044*f1, Errorvar.= 0.099 , R8 = 0.019
(0.015) (0.0045)
-2.95 21.84

a4 = - 0.024*f1, Errorvar.= 0.19 , R8 = 0.0030
(0.020) (0.0084)
-1.18 22.28

a5 = - 0.17*f1, Errorvar.= 0.21 , R8 = 0.13
(0.025) (0.012)
-6.80 17.62

a6 = - 0.028*f1, Errorvar.= 0.10 , R8 = 0.0075
(0.015) (0.0046)
-1.80 22.13

a7 = - 0.078*f1, Errorvar.= 0.19 , R8 = 0.031
(0.020) (0.0090)
-3.94 21.66

a8 = - 0.038*f1, Errorvar.= 0.13 , R8 = 0.011
(0.016) (0.0059)
-2.38 22.11

a9 = - 0.031*f1, Errorvar.= 0.12 , R8 = 0.0081
(0.015) (0.0053)
-2.02 22.17

a10 = - 0.024*f1, Errorvar.= 0.087 , R8 = 0.0065
(0.013) (0.0039)
-1.82 22.21

a11 = - 0.0020*f1, Errorvar.= 0.060 , R8 = 0.00
(0.011) (0.0027)
-0.18 22.35

a12 = - 0.015*f1, Errorvar.= 0.076 , R8 = 0.0029
(0.015) (0.0034)

-1.01 22.26

a13 = - 0.089*f1, Errorvar.= 0.065 , R8 = 0.11
(0.013) (0.0035)
-6.60 18.76

a14 = 0.029*f1, Errorvar.= 0.16 , R8 = 0.0051
(0.018) (0.0073)
1.61 22.24

a15 = - 0.034*f1, Errorvar.= 0.045 , R8 = 0.025
(0.0095) (0.0020)
-3.54 21.81

a16 = - 0.023*f1, Errorvar.= 0.11 , R8 = 0.0049
(0.015) (0.0049)
-1.54 22.24

a17 = - 0.14*f1, Errorvar.= 0.19 , R8 = 0.098
(0.023) (0.0097)
-6.24 19.08

a18 = 0.20*f1, Errorvar.= 0.19 , R8 = 0.17
(0.024) (0.011)
8.09 16.37

a19 = 0.054*f1, Errorvar.= 0.15 , R8 = 0.020
(0.019) (0.0067)
2.91 21.77

a20 = - 0.075*f1, Errorvar.= 0.20 , R8 = 0.027
(0.021) (0.0092)
-3.49 21.58

a21 = 0.12*f1, Errorvar.= 0.23 , R8 = 0.060
(0.024) (0.011)
5.11 20.56

a22 = 0.12*f1, Errorvar.= 0.22 , R8 = 0.060
(0.021) (0.010)
5.48 20.96

a23 = - 0.012*f1, Errorvar.= 0.088 , R8 = 0.0015
(0.013) (0.0040)
-0.86 22.31

a24 = - 0.038*f1, Errorvar.= 0.13 , R8 = 0.011
(0.017) (0.0058)
-2.20 22.04

a25 = - 0.021*f1, Errorvar.= 0.16 , R8 = 0.0027
(0.018) (0.0072)
-1.15 22.29

Error Covariance for a3 and a1 = 0.0086
(0.0049)
1.77

Error Covariance for a3 and a2 = -0.01
(0.0043)
-1.63

Error Covariance for a6 and a2 = -0.01
(0.0043)
-1.65

Error Covariance for a8 and a6 = 0.0087
(0.0037)
2.35

Error Covariance for a9 and a2 = -0.01
(0.0046)
-2.02

Error Covariance for a10 and a1 = 0.011
(0.0046)
2.42

Error Covariance for a12 and a1 = 0.0095
(0.0042)
2.29

Error Covariance for a12 and a7 = 0.0081
(0.0038)
2.10

Error Covariance for a12 and a10 = 0.0043
(0.0025)
1.71

Error Covariance for a12 and a11 = 0.0046
(0.0021)
2.21

Error Covariance for a13 and a3 = -0.01
(0.0028)
-2.06

Error Covariance for a13 and a5 = -0.01
(0.0046)
-2.78

Error Covariance for a13 and a12 = 0.0075
(0.0025)
3.04

Error Covariance for a14 and a3 = -0.01
(0.0041)
-1.76

Error Covariance for a15 and a12 = 0.0091
(0.0019)

4.87

Error Covariance for a16 and a6 = 0.0057
(0.0033)
1.71

Error Covariance for a16 and a8 = 0.00
(0.0038)
-0.22

Error Covariance for a16 and a11 = 0.00
(0.0025)
-1.86

Error Covariance for a17 and a4 = 0.016
(0.0063)
2.45

Error Covariance for a18 and a6 = -0.01
(0.0050)
-1.60

Error Covariance for a18 and a12 = -0.01
(0.0044)
-2.22

Error Covariance for a18 and a17 = 0.024
(0.0075)
3.18

Error Covariance for a19 and a9 = 0.0084
(0.0042)
2.01

Error Covariance for a19 and a11 = 0.0066
(0.0030)
2.22

Error Covariance for a19 and a18 = -0.01
(0.0060)
-2.12

Error Covariance for a20 and a1 = -0.01
(0.0070)
-1.98

Error Covariance for a20 and a5 = -0.01
(0.0072)
-1.85

Error Covariance for a20 and a11 = 0.0054
(0.0035)
1.55

Error Covariance for a20 and a16 = 0.010
(0.0047)
2.13

Error Covariance for a21 and a1 = 0.016
(0.0077)
2.09

Error Covariance for a21 and a5 = 0.018
(0.0081)
2.26

Error Covariance for a22 and a2 = 0.014
(0.0065)
2.21

Error Covariance for a22 and a16 = -0.01
(0.0050)
-2.36

Error Covariance for a23 and a15 = 0.00
(0.0020)
-1.96

Error Covariance for a23 and a22 = 0.011
(0.0045)
2.50

Error Covariance for a24 and a1 = 0.014
(0.0055)
2.57

Error Covariance for a24 and a4 = 0.012
(0.0049)
2.55

Error Covariance for a24 and a5 = -0.01
(0.0057)
-1.88

Error Covariance for a24 and a7 = 0.0081
(0.0051)
1.59

Error Covariance for a25 and a3 = 0.0086
(0.0040)
2.14

Error Covariance for a25 and a15 = 0.00
(0.0027)
-1.58

Error Covariance for a25 and a19 = -0.01
(0.0049)
-1.63

Error Covariance for a25 and a24 = 0.0079
(0.0045)
1.74

Correlation Matrix of Independent Variables

f1
1.00

Goodness of Fit Statistics

Degrees of Freedom = 232
Minimum Fit Function Chi-Square = 148.20 (P = 1.00)
Normal Theory Weighted Least Squares Chi-Square = 148.18 (P = 1.00)
Estimated Non-centrality Parameter (NCP) = 0.0
90 Percent Confidence Interval for NCP = (0.0 ; 0.0)

Minimum Fit Function Value = 0.15
Population Discrepancy Function Value (F0) = 0.0
90 Percent Confidence Interval for F0 = (0.0 ; 0.0)
Root Mean Square Error of Approximation (RMSEA) = 0.0
90 Percent Confidence Interval for RMSEA = (0.0 ; 0.0)
P-Value for Test of Close Fit (RMSEA < 0.05) = 1.00

Expected Cross-Validation Index (ECVI) = 0.42
90 Percent Confidence Interval for ECVI = (0.42 ; 0.42)
ECVI for Saturated Model = 0.65
ECVI for Independence Model = 0.64

Chi-Square for Independence Model with 300 Degrees of Freedom = 590.84
Independence AIC = 640.84
Model AIC = 334.18
Saturated AIC = 650.00
Independence CAIC = 788.53
Model CAIC = 883.60
Saturated CAIC = 2570.02

Normed Fit Index (NFI) = 0.75
Non-Normed Fit Index (NNFI) = 1.37
Parsimony Normed Fit Index (PNFI) = 0.58
Comparative Fit Index (CFI) = 1.00
Incremental Fit Index (IFI) = 1.23
Relative Fit Index (RFI) = 0.68

Critical N (CN) = 1922.41

Root Mean Square Residual (RMR) = 0.0030
Standardized RMR = 0.021
Goodness of Fit Index (GFI) = 0.99
Adjusted Goodness of Fit Index (AGFI) = 0.98
Parsimony Goodness of Fit Index (PGFI) = 0.71

Time used: 0.203 Seconds

3. แสดงผลการวิเคราะห์องค์ประกอบเชิงยืนยันอันดับแรกในแต่ละตัวแปรขององค์ประกอบความสามารถด้านเหตุผล

DATE: 10/13/2009
TIME: 21:24

L I S R E L 8.72

BY

Karl G. J”reskog & Dag S”rbom

The following lines were read from file D:\จาก desktop\ครั้งที่ 1\f2\f2.SPJ:

TI f2
f2path
SYSTEM FILE from file 'C:\f2\f2.dsf'
Sample Size = 1000
Latent Variables f2
Relationships
a1_27 = f2
a2_28 = f2
a3_29 = f2
a4_30 = f2
a5_31 = f2
a6_32 = f2
a7_33 = f2
a8_34 = f2
a9_35 = f2
a10_36 = f2
a11_37 = f2
a12_38 = f2
a13_39 = f2
a14_40 = f2
a15_41 = f2
a16_42 = f2
a17_43 = f2
a18_44 = f2
a19_45 = f2
a20_46 = f2
a21_47 = f2
a22_48 = f2
a23_49 = f2

```
a24_50 = f2
a25_51 = f2
a26_52 = f2
a27_53 = f2
a28_54 = f2
a29_55 = f2
a30_56 = f2
a31_57 = f2
a32_58 = f2
a33_59 = f2
a34_60 = f2
a35_61 = f2
Set the Variance of f2 to 1.00
Path Diagram
Wide Print
End of Problem

Sample Size =  1000

TI f2

Covariance Matrix

    a1_27      a2_28      a3_29      a4_30      a5_31      a6_32
               a7_33      a8_34      a9_35     a10_36
--------   --------   --------   --------   --------   --------   ---
           -----   --------   --------   --------
                      a1_27       1.00
                a2_28       0.10       1.00
          a3_29      -0.05       0.35       1.00
    a4_30      -0.21      -0.35      -0.23       1.00
a5_31       0.18       0.00      -0.13      -0.56       1.00
a6_32      -0.30      -0.27      -0.14       0.36      -0.27
                 1.00
a7_33       0.13       0.02       0.24      -0.32       0.23      -
              0.12       1.00
a8_34       0.10       0.03       0.08      -0.41       0.10      -
         0.23      -0.02       1.00
a9_35       0.18       0.23       0.19      -0.29       0.14      -
    0.20       0.10       0.13       1.00
  a10_36      -0.27      -0.10      -0.10       0.26      -0.32
0.28      -0.15      -0.26      -0.40       1.00
a11_37       0.03       0.15       0.13      -0.12       0.24      -
0.22       0.16       0.06       0.25      -0.19
a12_38       0.08       0.06       0.08      -0.21       0.28      -
0.29       0.19       0.15       0.13      -0.28
a13_39       0.15       0.16       0.11      -0.24       0.31      -
0.21       0.04       0.13       0.21      -0.21
a14_40       0.04       0.03       0.04      -0.06       0.10      -
0.04       0.04      -0.19       0.01      -0.05
  a15_41      -0.12      -0.10      -0.16       0.12      -0.03
0.01      -0.15      -0.07      -0.08       0.07
a16_42       0.17       0.05       0.13      -0.19      -0.01      -
0.13      -0.01       0.04       0.24      -0.12
a17_43       0.08       0.07       0.06      -0.13       0.29      -
0.14       0.07       0.06       0.23      -0.11
a18_44       0.11       0.06       0.03      -0.16       0.15      -
0.04       0.12       0.03       0.10      -0.06
```

```
    a19_45       0.06      -0.01      -0.08       0.01       0.11
          0.00      -0.10       0.08      -0.10       0.03
a20_46      -0.12       0.03       0.05      -0.08      -0.11      -
          0.03      -0.09      -0.03       0.09      -0.02
a21_47      -0.02       0.21       0.11      -0.13       0.03      -
          0.03       0.08       0.00       0.22      -0.19
a22_48       0.06       0.01      -0.02      -0.03       0.03      -
          0.04       0.07      -0.07      -0.12      -0.15
    a23_49      -0.16      -0.08       0.02       0.01      -0.01
          0.00      -0.04      -0.01      -0.08       0.08
a24_50       0.11       0.07      -0.02      -0.05       0.31      -
          0.09      -0.09      -0.02      -0.01      -0.07
    a25_51      -0.03      -0.04       0.01       0.10      -0.20
          0.01       0.01      -0.10      -0.01      -0.02
a26_52       0.04       0.16      -0.03       0.00      -0.11      -
          0.06      -0.01       0.02       0.13      -0.06
    a27_53      -0.05      -0.21      -0.05       0.17      -0.15
          0.08      -0.08      -0.08      -0.10       0.10
a28_54       0.19      -0.07       0.09      -0.07       0.09      -
          0.12       0.05       0.05      -0.03      -0.07
a29_55       0.12       0.25       0.10      -0.12       0.08      -
          0.15       0.12       0.10       0.08      -0.17
    a30_56      -0.03       0.13      -0.13      -0.03       0.09
          0.03      -0.12       0.03      -0.16      -0.07
a31_57       0.07      -0.23       0.13      -0.16       0.05      -
          0.02       0.05       0.16       0.16      -0.20
a32_58       0.24       0.11       0.09      -0.03       0.01      -
          0.25       0.04       0.01       0.21      -0.12
    a33_59       0.00      -0.18       0.08       0.04      -0.21
          0.08       0.04      -0.02      -0.12      -0.02
    a34_60      -0.03       0.06      -0.02       0.04      -0.11
          0.02      -0.05      -0.08      -0.09       0.07
a35_61      -0.06       0.10       0.04      -0.05       0.17      -
          0.09       0.05       0.16       0.07      -0.05
```

Covariance Matrix

```
    a11_37     a12_38     a13_39     a14_40     a15_41     a16_42
               a17_43     a18_44     a19_45     a20_46
--------   --------   --------   --------   --------   --------   ---
                -----   --------   --------   --------
                       a11_37       1.00
                  a12_38       0.20       1.00
               a13_39       0.12       0.29       1.00
         a14_40       0.04      -0.08      -0.02       1.00
    a15_41      -0.05      -0.08      -0.10       0.01       1.00
    a16_42      -0.02       0.12       0.23       0.05      -0.22
                                1.00
    a17_43      -0.04       0.06       0.11      -0.07       0.01
                           0.08       1.00
a18_44      -0.03       0.06       0.08       0.06       0.02      -
                     0.01      -0.02       1.00
a19_45      -0.03      -0.06       0.00      -0.04       0.00      -
                0.15       0.10      -0.40       1.00
    a20_46       0.09       0.05       0.04       0.07      -0.04
          0.05      -0.04       0.01      -0.05       1.00
    a21_47       0.10       0.11       0.05      -0.02      -0.05
          0.07       0.00       0.14      -0.07       0.02
```

```
a22_48       0.02       0.05       0.11       0.06      -0.04      -
         0.11      -0.09      -0.05       0.10       0.01
a23_49      -0.06      -0.03      -0.01      -0.10       0.06      -
         0.06       0.02      -0.10       0.03      -0.08
a24_50      -0.09       0.09      -0.04       0.02      -0.06      -
         0.15       0.00       0.08      -0.04       0.10
a25_51       0.07       0.04      -0.16      -0.07       0.05      -
         0.04      -0.01      -0.05      -0.01      -0.09
a26_52      -0.09       0.05       0.07      -0.07       0.05      -
         0.02      -0.08      -0.01       0.02       0.03
a27_53      -0.17      -0.11      -0.13      -0.05      -0.02      -
         0.08       0.03      -0.16      -0.03      -0.05
    a28_54       0.00       0.11      -0.04       0.00       0.00
         0.08       0.06      -0.01       0.06       0.05
    a29_55       0.10       0.06       0.06      -0.02      -0.11
         0.10       0.08       0.08       0.01       0.00
a30_56      -0.02      -0.03       0.12      -0.05       0.06      -
         0.01      -0.07      -0.07      -0.11      -0.03
    a31_57       0.00       0.20       0.09       0.05      -0.12
         0.25      -0.04       0.14      -0.01       0.02
    a32_58       0.22       0.13      -0.02       0.10       0.05
         0.06      -0.02       0.04      -0.04      -0.01
a33_59      -0.01      -0.10      -0.01      -0.10      -0.03      -
         0.07       0.05      -0.02       0.11      -0.03
a34_60      -0.06      -0.11      -0.15       0.07       0.01      -
         0.08      -0.10      -0.12      -0.01       0.03
    a35_61       0.02       0.05      -0.03       0.13      -0.10
         0.14       0.10       0.08       0.00      -0.04

                        Covariance Matrix

   a21_47     a22_48     a23_49     a24_50     a25_51     a26_52
              a27_53     a28_54     a29_55     a30_56
--------   --------   --------   --------   --------   --------   ---
               -----   --------   --------   --------
                       a21_47       1.00
                   a22_48      -0.03       1.00
               a23_49      -0.16      -0.01       1.00
         a24_50       0.10      -0.08      -0.12       1.00
    a25_51      -0.11      -0.06       0.00      -0.12       1.00
    a26_52      -0.06      -0.05       0.02      -0.08       0.15
                                1.00
a27_53      -0.08      -0.07       0.01       0.01       0.08      -
                           0.03       1.00
a28_54      -0.16      -0.04       0.01      -0.06       0.05      -
                    0.04       0.05       1.00
    a29_55       0.11       0.08      -0.08      -0.14       0.01
                0.06      -0.20       0.14       1.00
    a30_56       0.02      -0.08       0.07       0.12      -0.06
         0.06      -0.13      -0.09      -0.04       1.00
    a31_57       0.13       0.03      -0.11      -0.01       0.04
         0.11      -0.01       0.22       0.11       0.00
    a32_58       0.15      -0.06       0.04      -0.06      -0.04
         0.06      -0.17       0.14       0.06       0.09
a33_59      -0.06      -0.01      -0.02      -0.08       0.06      -
         0.07       0.20       0.03      -0.06      -0.25
    a34_60      -0.22       0.08       0.07      -0.18      -0.05
         0.03       0.01      -0.15      -0.14       0.19
```

a35_61 0.16 0.04 -0.10 0.08 -0.14 -
0.13 -0.06 0.01 -0.04 0.18

Covariance Matrix

	a31_57	a32_58	a33_59	a34_60	a35_61
a31_57	1.00				
a32_58	0.24	1.00			
a33_59	-0.23	-0.27	1.00		
a34_60	-0.21	-0.14	-0.07	1.00	
a35_61	0.11	0.19	-0.28	0.17	1.00

TI f2

Number of Iterations = 12

LISREL Estimates (Maximum Likelihood)

Measurement Equations

a1_27 = 0.36*f2, Errorvar.= 0.87 , R8 = 0.13
(0.034) (0.040)
10.52 21.58

a2_28 = 0.35*f2, Errorvar.= 0.88 , R8 = 0.12
(0.034) (0.041)
10.35 21.61

a3_29 = 0.26*f2, Errorvar.= 0.93 , R8 = 0.068
(0.035) (0.042)
7.53 21.97

a4_30 = - 0.68*f2, Errorvar.= 0.54 , R8 = 0.46
(0.031) (0.030)
-21.91 17.91

a5_31 = 0.55*f2, Errorvar.= 0.69 , R8 = 0.31
(0.032) (0.035)
17.17 20.02

a6_32 = - 0.52*f2, Errorvar.= 0.72 , R8 = 0.28
(0.033) (0.036)
-16.12 20.35

a7_33 = 0.32*f2, Errorvar.= 0.90 , R8 = 0.10
(0.034) (0.041)
9.35 21.75

a8_34 = 0.35*f2, Errorvar.= 0.87 , R8 = 0.13
(0.034) (0.041)
10.42 21.60

a9_35 = 0.48*f2, Errorvar.= 0.77 , R8 = 0.23
(0.033) (0.037)
14.64 20.75

a10_36 = - 0.53*f2, Errorvar.= 0.72 , R8 = 0.28
(0.032) (0.035)
-16.37 20.27

a11_37 = 0.32*f2, Errorvar.= 0.90 , R8 = 0.100
(0.034) (0.041)
9.22 21.77

a12_38 = 0.43*f2, Errorvar.= 0.82 , R8 = 0.18
(0.033) (0.039)
12.71 21.19

a13_39 = 0.41*f2, Errorvar.= 0.83 , R8 = 0.17
(0.034) (0.039)
12.21 21.29

a14_40 = 0.063*f2, Errorvar.= 1.00 , R8 = 0.0039
(0.035) (0.045)
1.79 22.33

a15_41 = - 0.18*f2, Errorvar.= 0.97 , R8 = 0.031
(0.035) (0.044)
-5.07 22.18

a16_42 = 0.28*f2, Errorvar.= 0.92 , R8 = 0.076
(0.034) (0.042)
8.00 21.92

a17_43 = 0.23*f2, Errorvar.= 0.95 , R8 = 0.052
(0.035) (0.043)
6.59 22.06

a18_44 = 0.21*f2, Errorvar.= 0.96 , R8 = 0.043
(0.035) (0.043)
5.99 22.11

a19_45 = - 0.049*f2, Errorvar.= 1.00 , R8 = 0.0024
(0.035) (0.045)
-1.40 22.34

a20_46 = 0.045*f2, Errorvar.= 1.00 , R8 = 0.0020
(0.035) (0.045)
1.28 22.34

a21_47 = 0.25*f2, Errorvar.= 0.94 , R8 = 0.061
(0.035) (0.043)
7.15 22.01

a22_48 = 0.045*f2, Errorvar.= 1.00 , R8 = 0.0021
(0.035) (0.045)
1.29 22.34

```
a23_49 =  - 0.11*f2, Errorvar.= 0.99  , R8 = 0.013
           (0.035)             (0.044)
            -3.20               22.28

 a24_50 = 0.11*f2, Errorvar.= 0.99  , R8 = 0.013
           (0.035)             (0.044)
            3.23               22.28

a25_51 =  - 0.12*f2, Errorvar.= 0.99  , R8 = 0.014
           (0.035)             (0.044)
            -3.35               22.28

 a26_52 = 0.036*f2, Errorvar.= 1.00  , R8 = 0.0013
          (0.035)              (0.045)
            1.02               22.34

a27_53 =  - 0.27*f2, Errorvar.= 0.93  , R8 = 0.073
           (0.034)             (0.042)
            -7.82               21.94

 a28_54 = 0.13*f2, Errorvar.= 0.98  , R8 = 0.017
           (0.035)             (0.044)
            3.76               22.26

 a29_55 = 0.27*f2, Errorvar.= 0.93  , R8 = 0.072
           (0.034)             (0.042)
            7.80               21.94

a30_56 = 0.026*f2, Errorvar.= 1.00  , R8 = 0.00069
           (0.035)             (0.045)
            0.75               22.35

 a31_57 = 0.26*f2, Errorvar.= 0.93  , R8 = 0.069
           (0.035)             (0.042)
            7.60               21.96

 a32_58 = 0.26*f2, Errorvar.= 0.93  , R8 = 0.067
           (0.035)             (0.042)
            7.50               21.97

a33_59 =  - 0.18*f2, Errorvar.= 0.97  , R8 = 0.031
           (0.035)             (0.044)
            -5.07               22.18

a34_60 =  - 0.17*f2, Errorvar.= 0.97  , R8 = 0.029
           (0.035)             (0.044)
            -4.87               22.19

 a35_61 = 0.18*f2, Errorvar.= 0.97  , R8 = 0.033
           (0.035)             (0.044)
            5.20               22.17
```

Correlation Matrix of Independent Variables

f2
1.00

Goodness of Fit Statistics

Degrees of Freedom = 560
Minimum Fit Function Chi-Square = 7067.83 (P = 0.0)
Normal Theory Weighted Least Squares Chi-Square = 4758.57 (P = 0.0)
Estimated Non-centrality Parameter (NCP) = 4198.57
90 Percent Confidence Interval for NCP = (3981.97 ; 4422.46)

Minimum Fit Function Value = 7.07
Population Discrepancy Function Value (F0) = 4.20
90 Percent Confidence Interval for F0 = (3.99 ; 4.43)
Root Mean Square Error of Approximation (RMSEA) = 0.087
90 Percent Confidence Interval for RMSEA = (0.084 ; 0.089)
P-Value for Test of Close Fit (RMSEA < 0.05) = 0.00

Expected Cross-Validation Index (ECVI) = 4.90
90 Percent Confidence Interval for ECVI = (4.69 ; 5.13)
ECVI for Saturated Model = 1.26
ECVI for Independence Model = 8.87

Chi-Square for Independence Model with 595 Degrees of Freedom = 8787.18
Independence AIC = 8857.18
Model AIC = 4898.57
Saturated AIC = 1260.00
Independence CAIC = 9063.95
Model CAIC = 5312.11
Saturated CAIC = 4981.89

Normed Fit Index (NFI) = 0.20
Non-Normed Fit Index (NNFI) = 0.16
Parsimony Normed Fit Index (PNFI) = 0.18
Comparative Fit Index (CFI) = 0.21
Incremental Fit Index (IFI) = 0.21
Relative Fit Index (RFI) = 0.15

Critical N (CN) = 91.57

Root Mean Square Residual (RMR) = 0.078
Standardized RMR = 0.078
Goodness of Fit Index (GFI) = 0.79
Adjusted Goodness of Fit Index (AGFI) = 0.76
Parsimony Goodness of Fit Index (PGFI) = 0.70

The Modification Indices Suggest to Add an Error Covariance

Between	and	Decrease in Chi-Square	New Estimate
a3_29	a1_27	26.4	-0.15

a3_29	a2_28	88.7	0.28
a4_30	a2_28	32.9	-0.14
a5_31	a2_28	72.6	-0.23
a5_31	a3_29	132.1	-0.31
a5_31	a4_30	136.2	-0.28
a6_32	a1_27	21.8	-0.13
a6_32	a2_28	13.0	-0.10
a7_33	a2_28	10.5	-0.09
a7_33	a3_29	30.0	0.16
a7_33	a4_30	31.4	-0.14
a8_34	a2_28	12.0	-0.10
a8_34	a4_30	80.4	-0.23
a8_34	a5_31	17.9	-0.11
a8_34	a7_33	24.1	-0.14
a9_35	a5_31	38.1	-0.16
a10_36	a1_27	11.8	-0.09
a10_36	a2_28	14.3	0.10
a10_36	a4_30	35.9	-0.14
a10_36	a8_34	10.6	-0.09
a10_36	a9_35	42.9	-0.17
a11_37	a1_27	9.3	-0.09
a11_37	a4_30	21.7	0.12
a11_37	a9_35	14.1	0.10
a12_38	a1_27	8.9	-0.08
a12_38	a2_28	11.9	-0.10
a12_38	a4_30	17.3	0.10
a12_38	a9_35	10.1	-0.09
a13_39	a5_31	14.6	0.10
a13_39	a7_33	13.2	-0.10
a13_39	a12_38	23.1	0.13
a14_40	a8_34	52.3	-0.22
a14_40	a12_38	16.1	-0.12
a15_41	a3_29	15.8	-0.12
a15_41	a5_31	8.8	0.08
a15_41	a6_32	9.9	-0.09
a15_41	a7_33	10.7	-0.10
a16_42	a5_31	46.9	-0.19
a16_42	a7_33	12.9	-0.11
a16_42	a9_35	16.8	0.11
a16_42	a11_37	15.2	-0.12
a16_42	a13_39	18.9	0.12
a16_42	a15_41	33.6	-0.18
a17_43	a5_31	48.6	0.19
a17_43	a9_35	21.4	0.13
a17_43	a11_37	16.3	-0.12
a18_44	a6_32	8.1	0.08
a18_44	a11_37	10.3	-0.10
a19_45	a5_31	29.5	0.15
a19_45	a8_34	10.7	0.10
a19_45	a16_42	20.0	-0.14
a19_45	a17_43	12.5	0.11
a19_45	a18_44	163.6	-0.40
a20_46	a1_27	21.8	-0.14
a20_46	a5_31	31.1	-0.16
a20_46	a7_33	12.2	-0.11
a21_47	a1_27	15.0	-0.11
a21_47	a2_28	20.0	0.13
a21_47	a5_31	19.0	-0.12

a21_47	a6_32	15.4	0.11
a21_47	a8_34	8.8	-0.09
a21_47	a9_35	15.4	0.11
a21_47	a18_44	8.6	0.09
a22_48	a8_34	9.7	-0.09
a22_48	a9_35	29.7	-0.16
a22_48	a10_36	25.7	-0.14
a22_48	a13_39	9.9	0.09
a22_48	a16_42	15.7	-0.12
a22_48	a17_43	10.8	-0.10
a22_48	a19_45	10.1	0.10
a23_49	a1_27	17.7	-0.13
a23_49	a4_30	8.8	-0.08
a23_49	a14_40	8.2	-0.09
a23_49	a21_47	19.8	-0.14
a24_50	a5_31	98.6	0.28
a24_50	a7_33	19.2	-0.13
a24_50	a11_37	19.2	-0.13
a24_50	a13_39	9.6	-0.09
a24_50	a16_42	36.1	-0.18
a24_50	a20_46	8.4	0.09
a24_50	a23_49	12.7	-0.11
a25_51	a5_31	31.6	-0.16
a25_51	a10_36	10.3	-0.09
a25_51	a11_37	13.8	0.11
a25_51	a12_38	9.8	0.09
a25_51	a13_39	14.8	-0.11
a25_51	a20_46	8.2	-0.09
a25_51	a24_50	11.3	-0.11
a26_52	a2_28	26.6	0.16
a26_52	a5_31	26.4	-0.14
a26_52	a9_35	17.5	0.12
a26_52	a11_37	12.7	-0.11
a26_52	a17_43	8.3	-0.09
a26_52	a25_51	24.6	0.16
a27_53	a2_28	16.1	-0.12
a27_53	a11_37	9.0	-0.09
a27_53	a17_43	9.1	0.09
a27_53	a18_44	11.8	-0.10
a28_54	a1_27	25.8	0.15
a28_54	a2_28	16.6	-0.12
a28_54	a9_35	12.6	-0.10
a28_54	a13_39	10.6	-0.10
a28_54	a21_47	39.7	-0.19
a28_54	a27_53	7.9	0.09
a29_55	a2_28	32.6	0.17
a29_55	a4_30	8.5	0.07
a29_55	a24_50	34.3	-0.18
a29_55	a27_53	20.1	-0.13
a29_55	a28_54	12.4	0.11
a30_56	a2_28	17.6	0.13
a30_56	a3_29	20.0	-0.14
a30_56	a5_31	8.8	0.08
a30_56	a7_33	19.0	-0.13
a30_56	a9_35	42.4	-0.19
a30_56	a13_39	15.7	0.12
a30_56	a19_45	12.8	-0.11
a30_56	a24_50	13.6	0.12

a30_56	a27_53	17.9	-0.13
a30_56	a28_54	9.9	-0.10
a31_57	a2_28	135.0	-0.34
a31_57	a5_31	17.4	-0.11
a31_57	a6_32	21.2	0.13
a31_57	a11_37	8.6	-0.09
a31_57	a12_38	11.4	0.10
a31_57	a16_42	38.5	0.19
a31_57	a17_43	12.0	-0.10
a31_57	a18_44	8.2	0.09
a31_57	a26_52	11.7	0.11
a31_57	a28_54	39.5	0.19
a32_58	a1_27	27.3	0.15
a32_58	a4_30	51.4	0.18
a32_58	a5_31	33.6	-0.16
a32_58	a6_32	23.0	-0.13
a32_58	a8_34	8.7	-0.09
a32_58	a9_35	10.9	0.09
a32_58	a11_37	22.4	0.14
a32_58	a13_39	22.0	-0.14
a32_58	a15_41	11.3	0.10
a32_58	a21_47	8.9	0.09
a32_58	a24_50	8.2	-0.09
a32_58	a27_53	11.2	-0.10
a32_58	a28_54	12.4	0.11
a32_58	a31_57	34.7	0.18
a33_59	a2_28	15.6	-0.12
a33_59	a3_29	18.5	0.13
a33_59	a4_30	13.9	-0.10
a33_59	a5_31	20.8	-0.13
a33_59	a7_33	11.9	0.10
a33_59	a10_36	20.1	-0.12
a33_59	a17_43	8.8	0.09
a33_59	a19_45	10.7	0.10
a33_59	a27_53	25.0	0.15
a33_59	a30_56	60.2	-0.24
a33_59	a31_57	37.4	-0.19
a33_59	a32_58	59.3	-0.23
a34_60	a2_28	18.9	0.13
a34_60	a4_30	12.7	-0.09
a34_60	a13_39	8.5	-0.09
a34_60	a21_47	36.6	-0.18
a34_60	a24_50	26.9	-0.16
a34_60	a28_54	17.1	-0.13
a34_60	a29_55	10.4	-0.10
a34_60	a30_56	37.3	0.19
a34_60	a31_57	29.3	-0.16
a34_60	a32_58	10.9	-0.10
a34_60	a33_59	10.6	-0.10
a35_61	a1_27	18.8	-0.13
a35_61	a4_30	12.1	0.09
a35_61	a8_34	10.5	0.10
a35_61	a13_39	14.0	-0.11
a35_61	a14_40	14.5	0.12
a35_61	a16_42	8.7	0.09
a35_61	a21_47	16.2	0.12
a35_61	a25_51	15.1	-0.12
a35_61	a26_52	20.9	-0.14

a35_61	a29_55	9.4	-0.09
a35_61	a30_56	30.9	0.17
a35_61	a32_58	24.0	0.15
a35_61	a33_59	64.9	-0.25
a35_61	a34_60	43.4	0.20

Time used: 0.453 Seconds

4. แสดงผลการวิเคราะห์องค์ประกอบเชิงยืนยันอันดับสองในแต่ละตัวแปรขององค์ประกอบความสามารถด้านเหตุผล

DATE: 10/13/2009
TIME: 21:37

L I S R E L 8.72

BY

Karl G. J”reskog & Dag S”rbom

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The following lines were read from file D:\จาก desktop\ครั้งที่ 2\f2\f2.SPJ:

TI f2
f2path
SYSTEM FILE from file 'C:\f2\f2.dsf'
Sample Size = 1000
Latent Variables f2
Relationships
a1_27 = f2
a2_28 = f2
a3_29 = f2
a4_30 = f2
a5_31 = f2
a6_32 = f2
a7_33 = f2
a8_34 = f2
a9_35 = f2
a10_36 = f2
a11_37 = f2
a12_38 = f2
a13_39 = f2
a14_40 = f2

a15_41 = f2
a16_42 = f2
a17_43 = f2
a18_44 = f2
a19_45 = f2
a20_46 = f2
a21_47 = f2
a22_48 = f2
a23_49 = f2
a24_50 = f2
a25_51 = f2
a26_52 = f2
a27_53 = f2
a28_54 = f2
a29_55 = f2
a30_56 = f2
a31_57 = f2
a32_58 = f2
a33_59 = f2
a34_60 = f2
a35_61 = f2
Set the Variance of f2 to 1.00
Set the Error Covariance of a3_29 and a1_27 Free
Set the Error Covariance of a3_29 and a2_28 Free
Set the Error Covariance of a4_30 and a2_28 Free
Set the Error Covariance of a4_30 and a3_29 Free
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Set the Error Covariance of a21_47 and a18_44 Free
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Set the Error Covariance of a22_48 and a9_35 Free

Set the Error Covariance of a22_48 and a10_36 Free
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Set the Error Covariance of a28_54 and a2_28 Free
Set the Error Covariance of a28_54 and a5_31 Free
Set the Error Covariance of a28_54 and a9_35 Free
Set the Error Covariance of a28_54 and a11_37 Free

Set the Error Covariance of a28_54 and a13_39 Free
Set the Error Covariance of a28_54 and a14_40 Free
Set the Error Covariance of a28_54 and a20_46 Free
Set the Error Covariance of a28_54 and a21_47 Free
Set the Error Covariance of a28_54 and a24_50 Free
Set the Error Covariance of a28_54 and a26_52 Free
Set the Error Covariance of a28_54 and a27_53 Free
Set the Error Covariance of a29_55 and a2_28 Free
Set the Error Covariance of a29_55 and a9_35 Free
Set the Error Covariance of a29_55 and a10_36 Free
Set the Error Covariance of a29_55 and a12_38 Free
Set the Error Covariance of a29_55 and a14_40 Free
Set the Error Covariance of a29_55 and a18_44 Free
Set the Error Covariance of a29_55 and a22_48 Free
Set the Error Covariance of a29_55 and a24_50 Free
Set the Error Covariance of a29_55 and a27_53 Free
Set the Error Covariance of a29_55 and a28_54 Free
Set the Error Covariance of a30_56 and a2_28 Free
Set the Error Covariance of a30_56 and a3_29 Free
Set the Error Covariance of a30_56 and a5_31 Free
Set the Error Covariance of a30_56 and a7_33 Free
Set the Error Covariance of a30_56 and a9_35 Free
Set the Error Covariance of a30_56 and a10_36 Free
Set the Error Covariance of a30_56 and a13_39 Free
Set the Error Covariance of a30_56 and a14_40 Free
Set the Error Covariance of a30_56 and a15_41 Free
Set the Error Covariance of a30_56 and a18_44 Free
Set the Error Covariance of a30_56 and a19_45 Free
Set the Error Covariance of a30_56 and a22_48 Free
Set the Error Covariance of a30_56 and a24_50 Free
Set the Error Covariance of a30_56 and a27_53 Free
Set the Error Covariance of a30_56 and a28_54 Free
Set the Error Covariance of a31_57 and a1_27 Free
Set the Error Covariance of a31_57 and a2_28 Free
Set the Error Covariance of a31_57 and a6_32 Free
Set the Error Covariance of a31_57 and a7_33 Free
Set the Error Covariance of a31_57 and a11_37 Free
Set the Error Covariance of a31_57 and a15_41 Free
Set the Error Covariance of a31_57 and a16_42 Free
Set the Error Covariance of a31_57 and a17_43 Free
Set the Error Covariance of a31_57 and a18_44 Free
Set the Error Covariance of a31_57 and a24_50 Free
Set the Error Covariance of a31_57 and a26_52 Free
Set the Error Covariance of a31_57 and a27_53 Free
Set the Error Covariance of a31_57 and a28_54 Free
Set the Error Covariance of a32_58 and a1_27 Free
Set the Error Covariance of a32_58 and a2_28 Free
Set the Error Covariance of a32_58 and a4_30 Free
Set the Error Covariance of a32_58 and a5_31 Free
Set the Error Covariance of a32_58 and a6_32 Free
Set the Error Covariance of a32_58 and a7_33 Free
Set the Error Covariance of a32_58 and a8_34 Free
Set the Error Covariance of a32_58 and a9_35 Free
Set the Error Covariance of a32_58 and a11_37 Free
Set the Error Covariance of a32_58 and a13_39 Free
Set the Error Covariance of a32_58 and a14_40 Free
Set the Error Covariance of a32_58 and a15_41 Free
Set the Error Covariance of a32_58 and a16_42 Free

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Set the Error Covariance of a32_58 and a21_47 Free
Set the Error Covariance of a32_58 and a22_48 Free
Set the Error Covariance of a32_58 and a23_49 Free
Set the Error Covariance of a32_58 and a24_50 Free
Set the Error Covariance of a32_58 and a27_53 Free
Set the Error Covariance of a32_58 and a28_54 Free
Set the Error Covariance of a32_58 and a30_56 Free
Set the Error Covariance of a32_58 and a31_57 Free
 Set the Error Covariance of a33_59 and a2_28 Free
 Set the Error Covariance of a33_59 and a3_29 Free
 Set the Error Covariance of a33_59 and a5_31 Free
 Set the Error Covariance of a33_59 and a7_33 Free
 Set the Error Covariance of a33_59 and a9_35 Free
Set the Error Covariance of a33_59 and a10_36 Free
Set the Error Covariance of a33_59 and a12_38 Free
Set the Error Covariance of a33_59 and a14_40 Free
Set the Error Covariance of a33_59 and a16_42 Free
Set the Error Covariance of a33_59 and a19_45 Free
Set the Error Covariance of a33_59 and a27_53 Free
Set the Error Covariance of a33_59 and a30_56 Free
Set the Error Covariance of a33_59 and a31_57 Free
Set the Error Covariance of a33_59 and a32_58 Free
 Set the Error Covariance of a34_60 and a2_28 Free
 Set the Error Covariance of a34_60 and a5_31 Free
 Set the Error Covariance of a34_60 and a6_32 Free
Set the Error Covariance of a34_60 and a13_39 Free
Set the Error Covariance of a34_60 and a14_40 Free
Set the Error Covariance of a34_60 and a18_44 Free
Set the Error Covariance of a34_60 and a21_47 Free
Set the Error Covariance of a34_60 and a24_50 Free
Set the Error Covariance of a34_60 and a28_54 Free
Set the Error Covariance of a34_60 and a29_55 Free
Set the Error Covariance of a34_60 and a30_56 Free
Set the Error Covariance of a34_60 and a31_57 Free
Set the Error Covariance of a34_60 and a32_58 Free
Set the Error Covariance of a34_60 and a33_59 Free
 Set the Error Covariance of a35_61 and a1_27 Free
 Set the Error Covariance of a35_61 and a2_28 Free
 Set the Error Covariance of a35_61 and a4_30 Free
 Set the Error Covariance of a35_61 and a5_31 Free
 Set the Error Covariance of a35_61 and a8_34 Free
Set the Error Covariance of a35_61 and a13_39 Free
Set the Error Covariance of a35_61 and a14_40 Free
Set the Error Covariance of a35_61 and a15_41 Free
Set the Error Covariance of a35_61 and a16_42 Free
Set the Error Covariance of a35_61 and a17_43 Free
Set the Error Covariance of a35_61 and a18_44 Free
Set the Error Covariance of a35_61 and a21_47 Free
Set the Error Covariance of a35_61 and a23_49 Free
Set the Error Covariance of a35_61 and a25_51 Free
Set the Error Covariance of a35_61 and a26_52 Free
Set the Error Covariance of a35_61 and a29_55 Free
Set the Error Covariance of a35_61 and a30_56 Free
Set the Error Covariance of a35_61 and a32_58 Free
Set the Error Covariance of a35_61 and a33_59 Free
Set the Error Covariance of a35_61 and a34_60 Free
                  Path Diagram
                End of Problem
```

Sample Size = 1000

TI f2

Covariance Matrix

	a1_27	a2_28	a3_29	a4_30	a5_31	a6_32
a1_27	1.00					
a2_28	0.10	1.00				
a3_29	-0.05	0.35	1.00			
a4_30	-0.21	-0.35	-0.23	1.00		
a5_31	0.18	0.00	-0.13	-0.56	1.00	
a6_32	-0.30	-0.27	-0.14	0.36	-0.27	1.00
a7_33	0.13	0.02	0.24	-0.32	0.23	-0.12
a8_34	0.10	0.03	0.08	-0.41	0.10	-0.23
a9_35	0.18	0.23	0.19	-0.29	0.14	-0.20
a10_36	-0.27	-0.10	-0.10	0.26	-0.32	0.28
a11_37	0.03	0.15	0.13	-0.12	0.24	-0.22
a12_38	0.08	0.06	0.08	-0.21	0.28	-0.29
a13_39	0.15	0.16	0.11	-0.24	0.31	-0.21
a14_40	0.04	0.03	0.04	-0.06	0.10	-0.04
a15_41	-0.12	-0.10	-0.16	0.12	-0.03	0.01
a16_42	0.17	0.05	0.13	-0.19	-0.01	-0.13
a17_43	0.08	0.07	0.06	-0.13	0.29	-0.14
a18_44	0.11	0.06	0.03	-0.16	0.15	-0.04
a19_45	0.06	-0.01	-0.08	0.01	0.11	0.00
a20_46	-0.12	0.03	0.05	-0.08	-0.11	-0.03
a21_47	-0.02	0.21	0.11	-0.13	0.03	-0.03
a22_48	0.06	0.01	-0.02	-0.03	0.03	-0.04
a23_49	-0.16	-0.08	0.02	0.01	-0.01	0.00
a24_50	0.11	0.07	-0.02	-0.05	0.31	-0.09
a25_51	-0.03	-0.04	0.01	0.10	-0.20	0.01
a26_52	0.04	0.16	-0.03	0.00	-0.11	-0.06
a27_53	-0.05	-0.21	-0.05	0.17	-0.15	0.08

a28_54	0.19	-0.07	0.09	-0.07	0.09	-0.12
a29_55	0.12	0.25	0.10	-0.12	0.08	-0.15
a30_56	-0.03	0.13	-0.13	-0.03	0.09	-0.03
a31_57	0.07	-0.23	0.13	-0.16	0.05	-0.02
a32_58	0.24	0.11	0.09	-0.03	0.01	-0.25
a33_59	0.00	-0.18	0.08	0.04	-0.21	0.08
a34_60	-0.03	0.06	-0.02	0.04	-0.11	0.02
a35_61	-0.06	0.10	0.04	-0.05	0.17	-0.09

Covariance Matrix

	a7_33	a8_34	a9_35	a10_36	a11_37	a12_38
a7_33	1.00					
a8_34	-0.02	1.00				
a9_35	0.10	0.13	1.00			
a10_36	-0.15	-0.26	-0.40	1.00		
a11_37	0.16	0.06	0.25	-0.19	1.00	
a12_38	0.19	0.15	0.13	-0.28	0.20	1.00
a13_39	0.04	0.13	0.21	-0.21	0.12	0.29
a14_40	0.04	-0.19	0.01	-0.05	0.04	-0.08
a15_41	-0.15	-0.07	-0.08	0.07	-0.05	-0.08
a16_42	-0.01	0.04	0.24	-0.12	-0.02	0.12
a17_43	0.07	0.06	0.23	-0.11	-0.04	0.06
a18_44	0.12	0.03	0.10	-0.06	-0.03	0.06
a19_45	-0.10	0.08	-0.10	0.03	-0.03	-0.06
a20_46	-0.09	-0.03	0.09	-0.02	0.09	0.05
a21_47	0.08	0.00	0.22	-0.19	0.10	0.11
a22_48	0.07	-0.07	-0.12	-0.15	0.02	0.05
a23_49	-0.04	-0.01	-0.08	0.08	-0.06	-0.03
a24_50	-0.09	-0.02	-0.01	-0.07	-0.09	0.09
a25_51	0.01	-0.10	-0.01	-0.02	0.07	0.04
a26_52	-0.01	0.02	0.13	-0.06	-0.09	0.05
a27_53	-0.08	-0.08	-0.10	0.10	-0.17	-0.11

a28_54	0.05	0.05	-0.03	-0.07	0.00	0.11
a29_55	0.12	0.10	0.08	-0.17	0.10	0.06
a30_56	-0.12	0.03	-0.16	-0.07	-0.02	-0.03
a31_57	0.05	0.16	0.16	-0.20	0.00	0.20
a32_58	0.04	0.01	0.21	-0.12	0.22	0.13
a33_59	0.04	-0.02	-0.12	-0.02	-0.01	-0.10
a34_60	-0.05	-0.08	-0.09	0.07	-0.06	-0.11
a35_61	0.05	0.16	0.07	-0.05	0.02	0.05

Covariance Matrix

	a13_39	a14_40	a15_41	a16_42	a17_43	a18_44
a13_39	1.00					
a14_40	-0.02	1.00				
a15_41	-0.10	0.01	1.00			
a16_42	0.23	0.05	-0.22	1.00		
a17_43	0.11	-0.07	0.01	0.08	1.00	
a18_44	0.08	0.06	0.02	-0.01	-0.02	1.00
a19_45	0.00	-0.04	0.00	-0.15	0.10	-0.40
a20_46	0.04	0.07	-0.04	0.05	-0.04	0.01
a21_47	0.05	-0.02	-0.05	0.07	0.00	0.14
a22_48	0.11	0.06	-0.04	-0.11	-0.09	-0.05
a23_49	-0.01	-0.10	0.06	-0.06	0.02	-0.10
a24_50	-0.04	0.02	-0.06	-0.15	0.00	0.08
a25_51	-0.16	-0.07	0.05	-0.04	-0.01	-0.05
a26_52	0.07	-0.07	0.05	-0.02	-0.08	-0.01
a27_53	-0.13	-0.05	-0.02	-0.08	0.03	-0.16
a28_54	-0.04	0.00	0.00	0.08	0.06	-0.01
a29_55	0.06	-0.02	-0.11	0.10	0.08	0.08
a30_56	0.12	-0.05	0.06	-0.01	-0.07	-0.07
a31_57	0.09	0.05	-0.12	0.25	-0.04	0.14
a32_58	-0.02	0.10	0.05	0.06	-0.02	0.04
a33_59	-0.01	-0.10	-0.03	-0.07	0.05	-0.02

```
a34_60      -0.15       0.07       0.01      -0.08      -0.10      -
                                    0.12
   a35_61      -0.03       0.13      -0.10       0.14       0.10
                                    0.08

                        Covariance Matrix

   a19_45     a20_46     a21_47     a22_48     a23_49     a24_50
  --------   --------   --------   --------   --------   --------
                        a19_45       1.00
                  a20_46      -0.05       1.00
             a21_47      -0.07       0.02       1.00
        a22_48       0.10       0.01      -0.03       1.00
   a23_49       0.03      -0.08      -0.16      -0.01       1.00
   a24_50      -0.04       0.10       0.10      -0.08      -0.12
                                    1.00
a25_51      -0.01      -0.09      -0.11      -0.06       0.00      -
                                    0.12
a26_52       0.02       0.03      -0.06      -0.05       0.02      -
                                    0.08
   a27_53      -0.03      -0.05      -0.08      -0.07       0.01
                                    0.01
a28_54       0.06       0.05      -0.16      -0.04       0.01      -
                                    0.06
a29_55       0.01       0.00       0.11       0.08      -0.08      -
                                    0.14
   a30_56      -0.11      -0.03       0.02      -0.08       0.07
                                    0.12
a31_57      -0.01       0.02       0.13       0.03      -0.11      -
                                    0.01
a32_58      -0.04      -0.01       0.15      -0.06       0.04      -
                                    0.06
a33_59       0.11      -0.03      -0.06      -0.01      -0.02      -
                                    0.08
a34_60      -0.01       0.03      -0.22       0.08       0.07      -
                                    0.18
   a35_61       0.00      -0.04       0.16       0.04      -0.10
                                    0.08

                        Covariance Matrix

   a25_51     a26_52     a27_53     a28_54     a29_55     a30_56
  --------   --------   --------   --------   --------   --------
                        a25_51       1.00
                  a26_52       0.15       1.00
             a27_53       0.08      -0.03       1.00
        a28_54       0.05      -0.04       0.05       1.00
   a29_55       0.01       0.06      -0.20       0.14       1.00
   a30_56      -0.06       0.06      -0.13      -0.09      -0.04
                                    1.00
   a31_57       0.04       0.11      -0.01       0.22       0.11
                                    0.00
   a32_58      -0.04       0.06      -0.17       0.14       0.06
                                    0.09
a33_59       0.06      -0.07       0.20       0.03      -0.06      -
                                    0.25
   a34_60      -0.05       0.03       0.01      -0.15      -0.14
                                    0.19
```

a35_61 -0.14 -0.13 -0.06 0.01 -0.04
0.18

Covariance Matrix

	a31_57	a32_58	a33_59	a34_60	a35_61
a31_57	1.00				
a32_58	0.24	1.00			
a33_59	-0.23	-0.27	1.00		
a34_60	-0.21	-0.14	-0.07	1.00	
a35_61	0.11	0.19	-0.28	0.17	1.00

TI f2

Number of Iterations = 19

LISREL Estimates (Maximum Likelihood)

Measurement Equations

a1_27 = 0.40*f2, Errorvar.= 0.84 , R8 = 0.16
(0.035) (0.040)
11.23 21.17

a2_28 = 0.21*f2, Errorvar.= 0.96 , R8 = 0.045
(0.037) (0.039)
5.71 24.37

a3_29 = 0.27*f2, Errorvar.= 0.93 , R8 = 0.074
(0.034) (0.042)
8.03 22.20

a4_30 = - 0.56*f2, Errorvar.= 0.69 , R8 = 0.31
(0.034) (0.034)
-16.72 20.16

a5_31 = 0.35*f2, Errorvar.= 0.86 , R8 = 0.12
(0.035) (0.034)
9.87 25.49

a6_32 = - 0.59*f2, Errorvar.= 0.66 , R8 = 0.34
(0.035) (0.038)
-16.55 17.31

a7_33 = 0.37*f2, Errorvar.= 0.88 , R8 = 0.13
(0.040) (0.043)
9.30 20.44

a8_34 = 0.28*f2, Errorvar.= 0.92 , R8 = 0.081
(0.036) (0.042)
7.84 22.13

a9_35 = 0.52*f2, Errorvar.= 0.73 , R8 = 0.27
(0.037) (0.040)
14.16 18.30

a10_36 = - 0.47*f2, Errorvar.= 0.78 , R8 = 0.22
(0.035) (0.038)
-13.44 20.40

a11_37 = 0.37*f2, Errorvar.= 0.87 , R8 = 0.14
(0.038) (0.042)
9.80 20.72

a12_38 = 0.51*f2, Errorvar.= 0.74 , R8 = 0.26
(0.039) (0.042)
12.96 17.66

a13_39 = 0.37*f2, Errorvar.= 0.87 , R8 = 0.14
(0.035) (0.040)
10.66 21.51

a14_40 = 0.095*f2, Errorvar.= 0.98 , R8 = 0.0091
(0.034) (0.044)
2.80 22.40

a15_41 = - 0.20*f2, Errorvar.= 0.96 , R8 = 0.040
(0.034) (0.043)
-5.89 22.23

a16_42 = 0.41*f2, Errorvar.= 0.84 , R8 = 0.16
(0.038) (0.042)
10.61 20.18

a17_43 = 0.16*f2, Errorvar.= 0.98 , R8 = 0.026
(0.035) (0.044)
4.66 22.41

a18_44 = 0.17*f2, Errorvar.= 0.98 , R8 = 0.030
(0.038) (0.044)
4.59 22.37

a19_45 = - 0.052*f2, Errorvar.= 1.00 , R8 = 0.0027
(0.035) (0.044)
-1.48 22.55

a20_46 = 0.11*f2, Errorvar.= 0.99 , R8 = 0.012
(0.035) (0.044)
3.14 22.36

a21_47 = 0.22*f2, Errorvar.= 0.94 , R8 = 0.050
(0.037) (0.042)
6.08 22.16

a22_48 = 0.089*f2, Errorvar.= 1.00 , R8 = 0.0080
(0.036) (0.044)
2.48 22.43

a23_49 = - 0.11*f2, Errorvar.= 0.98 , R8 = 0.012
(0.034) (0.044)
-3.24 22.34

a24_50 = 0.18*f2, Errorvar.= 0.98 , R8 = 0.034
(0.039) (0.043)
4.76 22.50

a25_51 = - 0.0077*f2, Errorvar.= 1.00 , R8 = 0.00
(0.035) (0.044)
-0.22 22.46

a26_52 = 0.065*f2, Errorvar.= 1.00 , R8 = 0.0042
(0.036) (0.045)
1.80 22.47

a27_53 = - 0.24*f2, Errorvar.= 0.95 , R8 = 0.056
(0.036) (0.043)
-6.60 22.03

a28_54 = 0.18*f2, Errorvar.= 0.97 , R8 = 0.031
(0.037) (0.044)
4.78 22.29

a29_55 = 0.28*f2, Errorvar.= 0.93 , R8 = 0.077
(0.035) (0.042)
7.90 21.90

a30_56 = - 0.026*f2, Errorvar.= 0.99 , R8 = 0.00067
(0.035) (0.043)
-0.73 22.98

a31_57 = 0.37*f2, Errorvar.= 0.87 , R8 = 0.13
(0.037) (0.041)
10.00 21.32

a32_58 = 0.24*f2, Errorvar.= 0.95 , R8 = 0.055
(0.044) (0.043)
5.40 21.93

a33_59 = - 0.089*f2, Errorvar.= 0.99 , R8 = 0.0080
(0.037) (0.043)
-2.42 22.85

a34_60 = - 0.13*f2, Errorvar.= 0.99 , R8 = 0.017
(0.036) (0.044)
-3.66 22.63

a35_61 = 0.16*f2, Errorvar.= 1.01 , R8 = 0.026
(0.035) (0.044)
4.58 22.98

Error Covariance for a3_29 and a1_27 = -0.17

(0.025)
-7.11

Error Covariance for a3_29 and a2_28 = 0.31
(0.027)
11.34

Error Covariance for a4_30 and a2_28 = -0.21
(0.024)
-9.00

Error Covariance for a4_30 and a3_29 = -0.06
(0.025)
-2.57

Error Covariance for a5_31 and a1_27 = 0.035
(0.017)
2.04

Error Covariance for a5_31 and a2_28 = -0.13
(0.021)
-5.89

Error Covariance for a5_31 and a3_29 = -0.21
(0.023)
-8.98

Error Covariance for a5_31 and a4_30 = -0.35
(0.025)
-13.83

Error Covariance for a6_32 and a1_27 = -0.06
(0.028)
-2.06

Error Covariance for a6_32 and a2_28 = -0.17
(0.024)
-7.04

Error Covariance for a7_33 and a2_28 = -0.06
(0.027)
-2.24

Error Covariance for a7_33 and a3_29 = 0.14
(0.031)
4.70

Error Covariance for a7_33 and a4_30 = -0.13
(0.031)
-4.17

Error Covariance for a7_33 and a5_31 = 0.11
(0.026)
4.49

Error Covariance for a7_33 and a6_32 = 0.12
(0.028)
4.36

Error Covariance for a8_34 and a4_30 = -0.26
(0.022)
-11.83

Error Covariance for a8_34 and a6_32 = -0.07
(0.024)
-3.05

Error Covariance for a8_34 and a7_33 = -0.12
(0.027)
-4.59

Error Covariance for a9_35 and a2_28 = 0.064
(0.022)
2.95

Error Covariance for a9_35 and a6_32 = 0.13
(0.024)
5.40

Error Covariance for a9_35 and a7_33 = -0.09
(0.026)
-3.49

Error Covariance for a10_36 and a1_27 = -0.07
(0.023)
-3.17

Error Covariance for a10_36 and a5_31 = -0.17
(0.017)
-9.75

Error Covariance for a10_36 and a8_34 = -0.14
(0.022)
-6.18

Error Covariance for a10_36 and a9_35 = -0.16
(0.027)
-5.89

Error Covariance for a11_37 and a1_27 = -0.08
(0.028)
-3.02

Error Covariance for a11_37 and a2_28 = 0.065
(0.026)
2.53

Error Covariance for a11_37 and a4_30 = 0.092
(0.024)
3.78

Error Covariance for a11_37 and a5_31 = 0.12
(0.025)
4.98

Error Covariance for a11_37 and a9_35 = 0.061

(0.029)
2.10

Error Covariance for a11_37 and a10_36 = -0.03
(0.026)
-1.07

Error Covariance for a12_38 and a1_27 = -0.13
(0.028)
-4.75

Error Covariance for a12_38 and a4_30 = 0.068
(0.024)
2.90

Error Covariance for a12_38 and a5_31 = 0.092
(0.023)
4.05

Error Covariance for a12_38 and a6_32 = 0.015
(0.029)
0.50

Error Covariance for a12_38 and a9_35 = -0.13
(0.027)
-4.83

Error Covariance for a12_38 and a10_36 = -0.03
(0.026)
-1.20

Error Covariance for a13_39 and a2_28 = 0.081
(0.022)
3.72

Error Covariance for a13_39 and a5_31 = 0.15
(0.018)
8.13

Error Covariance for a13_39 and a7_33 = -0.12
(0.027)
-4.43

Error Covariance for a13_39 and a12_38 = 0.11
(0.029)
3.83

Error Covariance for a14_40 and a5_31 = 0.062
(0.018)
3.46

Error Covariance for a14_40 and a8_34 = -0.20
(0.026)
-7.78

Error Covariance for a14_40 and a12_38 = -0.13
(0.028)
-4.76

Error Covariance for a14_40 and a13_39 = -0.07
(0.028)
-2.52

Error Covariance for a15_41 and a3_29 = -0.09
(0.025)
-3.50

Error Covariance for a15_41 and a6_32 = -0.12
(0.027)
-4.30

Error Covariance for a15_41 and a7_33 = -0.09
(0.028)
-3.32

Error Covariance for a16_42 and a5_31 = -0.14
(0.021)
-6.79

Error Covariance for a16_42 and a6_32 = 0.099
(0.028)
3.51

Error Covariance for a16_42 and a7_33 = -0.15
(0.029)
-5.18

Error Covariance for a16_42 and a8_34 = -0.08
(0.026)
-3.06

Error Covariance for a16_42 and a10_36 = 0.087
(0.024)
3.56

Error Covariance for a16_42 and a11_37 = -0.17
(0.029)
-5.88

Error Covariance for a16_42 and a12_38 = -0.07
(0.032)
-2.18

Error Covariance for a16_42 and a13_39 = 0.077
(0.027)
2.83

Error Covariance for a16_42 and a15_41 = -0.14
(0.028)
-4.94

Error Covariance for a17_43 and a5_31 = 0.23
(0.018)
12.72

Error Covariance for a17_43 and a9_35 = 0.15

(0.027)
5.68

Error Covariance for a17_43 and a10_36 = -0.05
(0.026)
-1.96

Error Covariance for a17_43 and a11_37 = -0.09
(0.028)
-3.31

Error Covariance for a17_43 and a14_40 = -0.06
(0.028)
-1.94

Error Covariance for a18_44 and a4_30 = -0.08
(0.023)
-3.33

Error Covariance for a18_44 and a5_31 = 0.095
(0.023)
4.20

Error Covariance for a18_44 and a6_32 = 0.067
(0.025)
2.68

Error Covariance for a18_44 and a7_33 = 0.069
(0.029)
2.40

Error Covariance for a18_44 and a11_37 = -0.08
(0.026)
-3.25

Error Covariance for a18_44 and a15_41 = 0.058
(0.026)
2.19

Error Covariance for a18_44 and a16_42 = -0.09
(0.029)
-3.04

Error Covariance for a18_44 and a17_43 = -0.06
(0.029)
-2.11

Error Covariance for a19_45 and a1_27 = 0.080
(0.023)
3.42

Error Covariance for a19_45 and a3_29 = -0.07
(0.025)
-2.81

Error Covariance for a19_45 and a5_31 = 0.10
(0.018)
5.87

Error Covariance for a19_45 and a7_33 = -0.10
(0.028)
-3.53

Error Covariance for a19_45 and a8_34 = 0.075
(0.023)
3.32

Error Covariance for a19_45 and a12_38 = -0.06
(0.025)
-2.42

Error Covariance for a19_45 and a16_42 = -0.12
(0.028)
-4.19

Error Covariance for a19_45 and a17_43 = 0.12
(0.029)
4.14

Error Covariance for a19_45 and a18_44 = -0.40
(0.033)
-12.38

Error Covariance for a20_46 and a1_27 = -0.15
(0.027)
-5.66

Error Covariance for a20_46 and a5_31 = -0.16
(0.015)
-10.24

Error Covariance for a20_46 and a7_33 = -0.16
(0.027)
-6.13

Error Covariance for a21_47 and a1_27 = -0.10
(0.028)
-3.65

Error Covariance for a21_47 and a2_28 = 0.17
(0.025)
6.69

Error Covariance for a21_47 and a3_29 = 0.061
(0.026)
2.30

Error Covariance for a21_47 and a5_31 = -0.04
(0.020)
-2.00

Error Covariance for a21_47 and a6_32 = 0.078
(0.027)
2.82

Error Covariance for a21_47 and a8_34 = -0.08

(0.025)
-3.15

Error Covariance for a21_47 and a9_35 = 0.091
(0.026)
3.47

Error Covariance for a21_47 and a10_36 = -0.08
(0.026)
-3.19

Error Covariance for a21_47 and a18_44 = 0.060
(0.025)
2.44

Error Covariance for a22_48 and a7_33 = 0.054
(0.027)
2.00

Error Covariance for a22_48 and a8_34 = -0.09
(0.024)
-3.68

Error Covariance for a22_48 and a9_35 = -0.17
(0.029)
-6.06

Error Covariance for a22_48 and a10_36 = -0.10
(0.027)
-3.88

Error Covariance for a22_48 and a13_39 = 0.086
(0.027)
3.21

Error Covariance for a22_48 and a16_42 = -0.14
(0.028)
-5.03

Error Covariance for a22_48 and a17_43 = -0.13
(0.028)
-4.80

Error Covariance for a22_48 and a21_47 = -0.05
(0.027)
-1.81

Error Covariance for a23_49 and a1_27 = -0.12
(0.028)
-4.42

Error Covariance for a23_49 and a2_28 = -0.10
(0.019)
-5.43

Error Covariance for a23_49 and a3_29 = 0.053
(0.026)
1.99

Error Covariance for a23_49 and a14_40 = -0.08
(0.029)
-2.82

Error Covariance for a23_49 and a20_46 = -0.07
(0.028)
-2.56

Error Covariance for a23_49 and a21_47 = -0.11
(0.028)
-3.88

Error Covariance for a24_50 and a4_30 = 0.069
(0.027)
2.58

Error Covariance for a24_50 and a5_31 = 0.22
(0.025)
8.64

Error Covariance for a24_50 and a7_33 = -0.16
(0.029)
-5.48

Error Covariance for a24_50 and a8_34 = -0.07
(0.024)
-2.99

Error Covariance for a24_50 and a9_35 = -0.11
(0.026)
-4.24

Error Covariance for a24_50 and a11_37 = -0.17
(0.029)
-5.94

Error Covariance for a24_50 and a13_39 = -0.11
(0.029)
-3.94

Error Covariance for a24_50 and a16_42 = -0.25
(0.030)
-8.39

Error Covariance for a24_50 and a20_46 = 0.10
(0.028)
3.55

Error Covariance for a24_50 and a21_47 = 0.045
(0.029)
1.55

Error Covariance for a24_50 and a22_48 = -0.09
(0.026)
-3.63

Error Covariance for a24_50 and a23_49 = -0.10

(0.026)
-3.81

Error Covariance for a25_51 and a4_30 = 0.087
(0.024)
3.67

Error Covariance for a25_51 and a5_31 = -0.19
(0.024)
-7.78

Error Covariance for a25_51 and a8_34 = -0.11
(0.027)
-4.11

Error Covariance for a25_51 and a11_37 = 0.078
(0.028)
2.79

Error Covariance for a25_51 and a13_39 = -0.15
(0.027)
-5.64

Error Covariance for a25_51 and a18_44 = -0.07
(0.026)
-2.58

Error Covariance for a25_51 and a20_46 = -0.11
(0.029)
-3.76

Error Covariance for a25_51 and a21_47 = -0.11
(0.028)
-3.99

Error Covariance for a25_51 and a22_48 = -0.07
(0.028)
-2.55

Error Covariance for a25_51 and a24_50 = -0.12
(0.028)
-4.20

Error Covariance for a26_52 and a2_28 = 0.15
(0.025)
5.96

Error Covariance for a26_52 and a5_31 = -0.15
(0.020)
-7.28

Error Covariance for a26_52 and a9_35 = 0.098
(0.026)
3.76

Error Covariance for a26_52 and a11_37 = -0.13
(0.029)
-4.50

Error Covariance for a26_52 and a13_39 = 0.050
(0.027)
1.85

Error Covariance for a26_52 and a14_40 = -0.06
(0.028)
-2.28

Error Covariance for a26_52 and a15_41 = 0.063
(0.028)
2.27

Error Covariance for a26_52 and a17_43 = -0.11
(0.030)
-3.66

Error Covariance for a26_52 and a21_47 = -0.07
(0.029)
-2.36

Error Covariance for a26_52 and a22_48 = -0.07
(0.028)
-2.31

Error Covariance for a26_52 and a24_50 = -0.09
(0.027)
-3.11

Error Covariance for a26_52 and a25_51 = 0.14
(0.030)
4.69

Error Covariance for a27_53 and a2_28 = -0.14
(0.025)
-5.64

Error Covariance for a27_53 and a5_31 = -0.05
(0.018)
-2.64

Error Covariance for a27_53 and a6_32 = -0.07
(0.027)
-2.40

Error Covariance for a27_53 and a11_37 = -0.08
(0.028)
-2.98

Error Covariance for a27_53 and a15_41 = -0.07
(0.028)
-2.63

Error Covariance for a27_53 and a18_44 = -0.11
(0.029)
-3.66

Error Covariance for a27_53 and a19_45 = -0.06

(0.029)
-2.02

Error Covariance for a27_53 and a24_50 = 0.058
(0.028)
2.11

Error Covariance for a28_54 and a1_27 = 0.13
(0.028)
4.80

Error Covariance for a28_54 and a2_28 = -0.11
(0.025)
-4.23

Error Covariance for a28_54 and a5_31 = 0.062
(0.019)
3.31

Error Covariance for a28_54 and a9_35 = -0.12
(0.026)
-4.51

Error Covariance for a28_54 and a11_37 = -0.06
(0.029)
-2.21

Error Covariance for a28_54 and a13_39 = -0.09
(0.026)
-3.30

Error Covariance for a28_54 and a14_40 = -0.02
(0.028)
-0.87

Error Covariance for a28_54 and a20_46 = 0.062
(0.028)
2.20

Error Covariance for a28_54 and a21_47 = -0.20
(0.029)
-6.94

Error Covariance for a28_54 and a24_50 = -0.08
(0.029)
-2.78

Error Covariance for a28_54 and a26_52 = -0.07
(0.029)
-2.31

Error Covariance for a28_54 and a27_53 = 0.068
(0.028)
2.45

Error Covariance for a29_55 and a2_28 = 0.19
(0.020)
9.45

Error Covariance for a29_55 and a9_35 = -0.09
(0.025)
-3.67

Error Covariance for a29_55 and a10_36 = -0.03
(0.024)
-1.27

Error Covariance for a29_55 and a12_38 = -0.08
(0.026)
-3.14

Error Covariance for a29_55 and a14_40 = -0.06
(0.028)
-2.21

Error Covariance for a29_55 and a18_44 = 0.052
(0.026)
2.05

Error Covariance for a29_55 and a22_48 = 0.081
(0.028)
2.90

Error Covariance for a29_55 and a24_50 = -0.20
(0.026)
-7.86

Error Covariance for a29_55 and a27_53 = -0.14
(0.029)
-4.77

Error Covariance for a29_55 and a28_54 = 0.11
(0.028)
3.89

Error Covariance for a30_56 and a2_28 = 0.13
(0.024)
5.26

Error Covariance for a30_56 and a3_29 = -0.11
(0.026)
-4.37

Error Covariance for a30_56 and a5_31 = 0.073
(0.020)
3.72

Error Covariance for a30_56 and a7_33 = -0.11
(0.028)
-3.98

Error Covariance for a30_56 and a9_35 = -0.16
(0.026)
-6.12

Error Covariance for a30_56 and a10_36 = -0.07

(0.025)
-2.97

Error Covariance for a30_56 and a13_39 = 0.13
(0.026)
4.75

Error Covariance for a30_56 and a14_40 = -0.06
(0.027)
-2.14

Error Covariance for a30_56 and a15_41 = 0.058
(0.026)
2.20

Error Covariance for a30_56 and a18_44 = -0.09
(0.027)
-3.32

Error Covariance for a30_56 and a19_45 = -0.10
(0.027)
-3.86

Error Covariance for a30_56 and a22_48 = -0.09
(0.027)
-3.27

Error Covariance for a30_56 and a24_50 = 0.10
(0.027)
3.83

Error Covariance for a30_56 and a27_53 = -0.12
(0.027)
-4.54

Error Covariance for a30_56 and a28_54 = -0.05
(0.027)
-2.02

Error Covariance for a31_57 and a1_27 = -0.06
(0.024)
-2.63

Error Covariance for a31_57 and a2_28 = -0.32
(0.026)
-12.48

Error Covariance for a31_57 and a6_32 = 0.21
(0.027)
7.63

Error Covariance for a31_57 and a7_33 = -0.06
(0.027)
-2.32

Error Covariance for a31_57 and a11_37 = -0.13
(0.027)
-4.79

Error Covariance for a31_57 and a15_41 = -0.08
(0.023)
-3.67

Error Covariance for a31_57 and a16_42 = 0.096
(0.025)
3.88

Error Covariance for a31_57 and a17_43 = -0.06
(0.023)
-2.87

Error Covariance for a31_57 and a18_44 = 0.10
(0.023)
4.28

Error Covariance for a31_57 and a24_50 = -0.07
(0.025)
-2.74

Error Covariance for a31_57 and a26_52 = 0.091
(0.026)
3.43

Error Covariance for a31_57 and a27_53 = 0.077
(0.028)
2.75

Error Covariance for a31_57 and a28_54 = 0.17
(0.028)
6.16

Error Covariance for a32_58 and a1_27 = 0.17
(0.030)
5.73

Error Covariance for a32_58 and a2_28 = 0.049
(0.026)
1.87

Error Covariance for a32_58 and a4_30 = 0.11
(0.028)
3.83

Error Covariance for a32_58 and a5_31 = -0.07
(0.023)
-3.08

Error Covariance for a32_58 and a6_32 = -0.11
(0.030)
-3.56

Error Covariance for a32_58 and a7_33 = -0.06
(0.027)
-2.07

Error Covariance for a32_58 and a8_34 = -0.07

(0.026)
-2.57

Error Covariance for a32_58 and a9_35 = 0.10
(0.027)
3.78

Error Covariance for a32_58 and a11_37 = 0.14
(0.028)
4.82

Error Covariance for a32_58 and a13_39 = -0.09
(0.026)
-3.62

Error Covariance for a32_58 and a14_40 = 0.083
(0.027)
3.08

Error Covariance for a32_58 and a15_41 = 0.081
(0.026)
3.07

Error Covariance for a32_58 and a16_42 = -0.04
(0.029)
-1.29

Error Covariance for a32_58 and a21_47 = 0.078
(0.028)
2.83

Error Covariance for a32_58 and a22_48 = -0.09
(0.025)
-3.60

Error Covariance for a32_58 and a23_49 = 0.064
(0.026)
2.43

Error Covariance for a32_58 and a24_50 = -0.12
(0.028)
-4.16

Error Covariance for a32_58 and a27_53 = -0.13
(0.027)
-4.95

Error Covariance for a32_58 and a28_54 = 0.10
(0.029)
3.56

Error Covariance for a32_58 and a30_56 = 0.10
(0.027)
3.80

Error Covariance for a32_58 and a31_57 = 0.14
(0.029)
4.75

Error Covariance for a33_59 and a2_28 = -0.12
(0.026)
-4.63

Error Covariance for a33_59 and a3_29 = 0.12
(0.027)
4.38

Error Covariance for a33_59 and a5_31 = -0.19
(0.019)
-10.08

Error Covariance for a33_59 and a7_33 = 0.061
(0.027)
2.23

Error Covariance for a33_59 and a9_35 = -0.09
(0.025)
-3.81

Error Covariance for a33_59 and a10_36 = -0.06
(0.024)
-2.64

Error Covariance for a33_59 and a12_38 = -0.06
(0.026)
-2.24

Error Covariance for a33_59 and a14_40 = -0.08
(0.027)
-3.06

Error Covariance for a33_59 and a16_42 = -0.06
(0.027)
-2.18

Error Covariance for a33_59 and a19_45 = 0.094
(0.025)
3.69

Error Covariance for a33_59 and a27_53 = 0.16
(0.028)
5.57

Error Covariance for a33_59 and a30_56 = -0.23
(0.030)
-7.70

Error Covariance for a33_59 and a31_57 = -0.21
(0.027)
-7.92

Error Covariance for a33_59 and a32_58 = -0.25
(0.028)
-8.91

Error Covariance for a34_60 and a2_28 = 0.081

(0.025)
3.25

Error Covariance for a34_60 and a5_31 = -0.07
(0.018)
-3.93

Error Covariance for a34_60 and a6_32 = -0.05
(0.026)
-1.89

Error Covariance for a34_60 and a13_39 = -0.13
(0.027)
-4.72

Error Covariance for a34_60 and a14_40 = 0.069
(0.028)
2.43

Error Covariance for a34_60 and a18_44 = -0.11
(0.026)
-4.28

Error Covariance for a34_60 and a21_47 = -0.18
(0.028)
-6.25

Error Covariance for a34_60 and a24_50 = -0.18
(0.029)
-6.02

Error Covariance for a34_60 and a28_54 = -0.13
(0.029)
-4.34

Error Covariance for a34_60 and a29_55 = -0.12
(0.028)
-4.21

Error Covariance for a34_60 and a30_56 = 0.18
(0.028)
6.34

Error Covariance for a34_60 and a31_57 = -0.17
(0.027)
-6.21

Error Covariance for a34_60 and a32_58 = -0.11
(0.028)
-4.02

Error Covariance for a34_60 and a33_59 = -0.09
(0.028)
-3.15

Error Covariance for a35_61 and a1_27 = -0.14
(0.025)
-5.45

Error Covariance for a35_61 and a2_28 = 0.073
(0.024)
2.98

Error Covariance for a35_61 and a4_30 = 0.049
(0.024)
2.06

Error Covariance for a35_61 and a5_31 = 0.10
(0.023)
4.60

Error Covariance for a35_61 and a8_34 = 0.12
(0.027)
4.66

Error Covariance for a35_61 and a13_39 = -0.10
(0.027)
-3.69

Error Covariance for a35_61 and a14_40 = 0.11
(0.030)
3.77

Error Covariance for a35_61 and a15_41 = -0.08
(0.026)
-3.16

Error Covariance for a35_61 and a16_42 = 0.073
(0.027)
2.67

Error Covariance for a35_61 and a17_43 = 0.14
(0.026)
5.36

Error Covariance for a35_61 and a18_44 = 0.045
(0.026)
1.74

Error Covariance for a35_61 and a21_47 = 0.13
(0.028)
4.58

Error Covariance for a35_61 and a23_49 = -0.10
(0.027)
-3.70

Error Covariance for a35_61 and a25_51 = -0.10
(0.027)
-3.62

Error Covariance for a35_61 and a26_52 = -0.17
(0.027)
-6.38

Error Covariance for a35_61 and a29_55 = -0.11

(0.026)
-4.28

Error Covariance for a35_61 and a30_56 = 0.18
(0.028)
6.46

Error Covariance for a35_61 and a32_58 = 0.16
(0.028)
5.55

Error Covariance for a35_61 and a33_59 = -0.27
(0.028)
-9.31

Error Covariance for a35_61 and a34_60 = 0.24
(0.029)
8.34

Correlation Matrix of Independent Variables

f2
1.00

Goodness of Fit Statistics

Degrees of Freedom = 294
Minimum Fit Function Chi-Square = 339.24 (P = 0.036)
Normal Theory Weighted Least Squares Chi-Square = 332.37 (P = 0.061)
Estimated Non-centrality Parameter (NCP) = 38.37
90 Percent Confidence Interval for NCP = (0.0 ; 87.35)

Minimum Fit Function Value = 0.34
Population Discrepancy Function Value (F0) = 0.038
90 Percent Confidence Interval for F0 = (0.0 ; 0.087)
Root Mean Square Error of Approximation (RMSEA) = 0.011
90 Percent Confidence Interval for RMSEA = (0.0 ; 0.017)
P-Value for Test of Close Fit (RMSEA < 0.05) = 1.00

Expected Cross-Validation Index (ECVI) = 1.01
90 Percent Confidence Interval for ECVI = (0.97 ; 1.05)
ECVI for Saturated Model = 1.26
ECVI for Independence Model = 8.87

Chi-Square for Independence Model with 595 Degrees of Freedom = 8787.18
Independence AIC = 8857.18
Model AIC = 1004.37
Saturated AIC = 1260.00
Independence CAIC = 9063.95
Model CAIC = 2989.38
Saturated CAIC = 4981.89

Normed Fit Index (NFI) = 0.96
Non-Normed Fit Index (NNFI) = 0.99
Parsimony Normed Fit Index (PNFI) = 0.48
Comparative Fit Index (CFI) = 0.99
Incremental Fit Index (IFI) = 0.99
Relative Fit Index (RFI) = 0.92

Critical N (CN) = 1041.52

Root Mean Square Residual (RMR) = 0.026
Standardized RMR = 0.026
Goodness of Fit Index (GFI) = 0.98
Adjusted Goodness of Fit Index (AGFI) = 0.96
Parsimony Goodness of Fit Index (PGFI) = 0.46

Time used: 1.141 Seconds

5. แสดงผลการวิเคราะห์องค์ประกอบเชิงยืนยันอันดับแรกในแต่ละตัวแปรขององค์ประกอบความสามารถด้านจำนวน

DATE: 10/13/2009
TIME: 21:28

L I S R E L 8.72

BY

Karl G. J”reskog & Dag S”rbom

The following lines were read from file D:\จาก desktop\ครั้งที่ 1\f3\f3.SPJ:

f3
SYSTEM FILE from file 'D:\จาก desktop\ครั้งที่ 1\f3\f3.DSF'
Sample Size = 1000
Latent Variables f3
Relationships
a1_62 = f3
a2_63 = f3
a3_64 = f3
a4_65 = f3

```
                          a5_66 = f3
                          a6_67 = f3
                          a7_68 = f3
                          a8_69 = f3
                          a9_70 = f3
                         a10_71 = f3
                         a11_72 = f3
                         a12_73 = f3
                         a13_74 = f3
                         a14_75 = f3
                         a15_76 = f3
                         a16_77 = f3
                         a17_78 = f3
                         a18_79 = f3
                         a19_80 = f3
                         a20_81 = f3
                         a21_82 = f3
                         a22_83 = f3
                         a23_84 = f3
                         a24_85 = f3
                         a25_86 = f3
                         a26_87 = f3
                         a27_88 = f3
                         a28_89 = f3
                         a29_90 = f3
                         a30_91 = f3
                 Set the Variance of f3 to 1.00
                       Path Diagram
                       Wide Print
                     End of Problem

                  Sample Size =  1000

                          f3

                   Covariance Matrix

     a1_62       a2_63       a3_64       a4_65       a5_66       a6_67
                 a7_68       a8_69       a9_70      a10_71
---------    ---------    ---------    ---------    ---------    ---------    ---
                 -----    ---------    ---------    ---------
                           a1_62        1.00
                      a2_63       -0.02        1.00
                 a3_64        0.07        0.19        1.00
           a4_65        0.14        0.04        0.22        1.00
     a5_66       -0.07        0.21        0.02        0.41        1.00
     a6_67       -0.22        0.14       -0.11        0.22        0.30
                                1.00
     a7_68        0.00        0.23        0.18        0.27        0.20
                               0.16        1.00
     a8_69       -0.02        0.04        0.14       -0.06       -0.05
                      0.02       -0.03        1.00
     a9_70       -0.15        0.13        0.18        0.25        0.07
                 0.17        0.43        0.10        1.00
    a10_71       -0.08        0.07        0.00        0.03        0.09
           0.07        0.16        0.13        0.14        1.00
a11_72        0.09        0.10        0.07        0.13        0.03       -
           0.05        0.05        0.08        0.09        0.12
```

```
a12_73       0.03      -0.07       0.18       0.14       0.04      -
          0.07      -0.07       0.17       0.19       0.12
    a13_74       0.08       0.13       0.00       0.10       0.19
          0.11       0.14      -0.07       0.14      -0.02
    a14_75      -0.12       0.15       0.10       0.13      -0.11
          0.13       0.24       0.10       0.12       0.10
    a15_76      -0.10       0.06       0.07       0.18       0.13
          0.21       0.11       0.11       0.09       0.09
    a16_77      -0.15       0.20      -0.12      -0.01       0.21
          0.01       0.22      -0.12       0.00      -0.05
    a17_78       0.07       0.19      -0.05       0.24       0.25
          0.12       0.08       0.16       0.01       0.17
    a18_79       0.07      -0.03       0.11       0.19       0.16
          0.21       0.20       0.08       0.16       0.06
a19_80      -0.10       0.18       0.12       0.18       0.04      -
          0.07       0.22       0.06       0.18       0.20
    a20_81      -0.13       0.06      -0.06       0.13       0.17
          0.17       0.23       0.13       0.11       0.05
    a21_82      -0.17       0.18       0.17       0.18       0.14
          0.04       0.29       0.15       0.34       0.10
a22_83      -0.12       0.15       0.06       0.20       0.29      -
          0.03       0.13       0.17       0.10       0.13
    a23_84       0.01       0.02       0.06       0.16      -0.03
          0.01       0.08      -0.01       0.03      -0.01
    a24_85      -0.01       0.09       0.03      -0.02       0.01
          0.03       0.07       0.07      -0.16      -0.03
a25_86       0.02      -0.01       0.13       0.10       0.03      -
          0.02      -0.06       0.02      -0.02       0.18
    a26_87       0.07      -0.05      -0.01      -0.02       0.00
          0.07      -0.17      -0.06      -0.05      -0.06
a27_88       0.01      -0.11      -0.09      -0.28      -0.22      -
          0.21      -0.23      -0.06      -0.30      -0.25
a28_89      -0.15      -0.06       0.05      -0.03      -0.09      -
          0.04       0.08      -0.01      -0.10       0.03
a29_90      -0.14       0.10      -0.11      -0.01       0.15      -
          0.02       0.05      -0.09      -0.07       0.18
a30_91      -0.07       0.02      -0.07      -0.11      -0.01      -
          0.02       0.02      -0.02       0.01       0.05
```

Covariance Matrix

```
    a11_72     a12_73     a13_74     a14_75     a15_76     a16_77
               a17_78     a18_79     a19_80     a20_81
--------   --------   --------   --------   --------   --------   ---
                -----   --------   --------   --------
                          a11_72       1.00
                    a12_73       0.47       1.00
               a13_74       0.07       0.07       1.00
         a14_75       0.03       0.17       0.19       1.00
    a15_76       0.16       0.24       0.26       0.20       1.00
    a16_77      -0.21      -0.17       0.06       0.03       0.18
                                1.00
    a17_78       0.11       0.24       0.11       0.01       0.06
                              0.16       1.00
    a18_79      -0.07       0.02       0.19       0.22       0.06
                    0.24       0.15       1.00
a19_80       0.30       0.32      -0.01       0.05       0.08      -
               0.06       0.01      -0.05       1.00
```

```
a20_81       -0.01       -0.09        0.16        0.02        0.01       -
          0.08       -0.10        0.12       -0.06        1.00
    a21_82        0.10        0.07        0.11        0.20       -0.02
          0.15        0.17        0.06        0.15        0.07
    a22_83        0.08        0.19        0.15        0.10        0.07
          0.19        0.12        0.19       -0.03        0.20
    a23_84       -0.09        0.14       -0.07        0.07        0.01
          0.04        0.05       -0.04        0.01        0.02
    a24_85       -0.08        0.02       -0.10       -0.04        0.12
          0.18        0.09        0.02       -0.06       -0.02
    a25_86        0.03        0.14        0.01       -0.04        0.10
          0.13        0.07        0.04        0.14       -0.11
    a26_87       -0.12       -0.09        0.08       -0.03       -0.14
          0.03       -0.01       -0.07       -0.09        0.12
a27_88       -0.23       -0.31       -0.15       -0.18       -0.25       -
          0.23       -0.25       -0.13       -0.25       -0.01
a28_89        0.15        0.11       -0.03        0.06       -0.01       -
          0.19       -0.02        0.01        0.10        0.02
a29_90        0.14        0.03       -0.03        0.10        0.02       -
          0.02        0.18       -0.09        0.07        0.18
    a30_91        0.00       -0.05        0.18        0.01       -0.04
          0.15        0.04        0.06       -0.05       -0.05

                        Covariance Matrix

    a21_82     a22_83     a23_84     a24_85     a25_86     a26_87
               a27_88     a28_89     a29_90     a30_91
--------   --------   --------   --------   --------   --------   ---
                -----   --------   --------   --------   --------
                        a21_82        1.00
                    a22_83        0.11        1.00
                a23_84        0.12       -0.03        1.00
          a24_85        0.15        0.22        0.00        1.00
    a25_86        0.03       -0.04       -0.01        0.17        1.00
    a26_87       -0.04       -0.09        0.00        0.09        0.03
                                1.00
    a27_88       -0.20       -0.13       -0.11       -0.06       -0.15
                             0.03        1.00
a28_89       -0.05       -0.03       -0.05       -0.04       -0.10       -
                         0.04        0.10        1.00
    a29_90        0.09        0.06        0.02        0.08        0.06
                  0.00       -0.12        0.02        1.00
a30_91        0.02        0.00       -0.09        0.05        0.01       -
          0.01        0.00        0.05       -0.10        1.00


                                f3

                Number of Iterations = 36

            LISREL Estimates (Maximum Likelihood)

                    Measurement Equations


          a1_62 = 0.096*f3, Errorvar.= 0.99  , R8 = 0.0093
                    (0.036)              (0.044)
```

```
            2.70                  22.29

a2_63 =  - 0.32*f3, Errorvar.= 0.90  , R8 = 0.10
           (0.035)              (0.042)
            -9.12                21.64

a3_64 =  - 0.23*f3, Errorvar.= 0.94  , R8 = 0.055
           (0.035)              (0.043)
            -6.65                21.98

a4_65 =  - 0.51*f3, Errorvar.= 0.74  , R8 = 0.26
           (0.033)              (0.037)
            -15.17               20.16

a5_66 =  - 0.43*f3, Errorvar.= 0.82  , R8 = 0.18
           (0.034)              (0.039)
            -12.57               20.93

a6_67 =  - 0.30*f3, Errorvar.= 0.91  , R8 = 0.090
           (0.035)              (0.042)
            -8.56                21.73

a7_68 =  - 0.52*f3, Errorvar.= 0.73  , R8 = 0.27
           (0.033)              (0.037)
            -15.47               20.05

a8_69 =  - 0.15*f3, Errorvar.= 0.98  , R8 = 0.021
           (0.036)              (0.044)
            -4.09                22.21

a9_70 =  - 0.48*f3, Errorvar.= 0.77  , R8 = 0.23
           (0.034)              (0.038)
            -14.16               20.49

a10_71 =  - 0.29*f3, Errorvar.= 0.91  , R8 = 0.085
           (0.035)              (0.042)
            -8.34                21.76

a11_72 =  - 0.27*f3, Errorvar.= 0.93  , R8 = 0.073
           (0.035)              (0.042)
            -7.66                21.86

a12_73 =  - 0.34*f3, Errorvar.= 0.89  , R8 = 0.11
           (0.035)              (0.041)
            -9.72                21.54

a13_74 =  - 0.29*f3, Errorvar.= 0.92  , R8 = 0.083
           (0.035)              (0.042)
            -8.20                21.78

a14_75 =  - 0.32*f3, Errorvar.= 0.90  , R8 = 0.099
           (0.035)              (0.042)
            -9.03                21.65

a15_76 =  - 0.34*f3, Errorvar.= 0.88  , R8 = 0.12
```

(0.035) (0.041)
-9.88 21.51

a16_77 = - 0.22*f3, Errorvar.= 0.95 , R8 = 0.047
(0.035) (0.043)
-6.14 22.04

a17_78 = - 0.35*f3, Errorvar.= 0.88 , R8 = 0.12
(0.035) (0.041)
-10.17 21.45

a18_79 = - 0.30*f3, Errorvar.= 0.91 , R8 = 0.093
(0.035) (0.042)
-8.70 21.71

a19_80 = - 0.32*f3, Errorvar.= 0.90 , R8 = 0.10
(0.035) (0.041)
-9.22 21.62

a20_81 = - 0.18*f3, Errorvar.= 0.97 , R8 = 0.032
(0.036) (0.044)
-5.05 22.14

a21_82 = - 0.42*f3, Errorvar.= 0.82 , R8 = 0.18
(0.034) (0.039)
-12.35 20.98

a22_83 = - 0.34*f3, Errorvar.= 0.88 , R8 = 0.12
(0.035) (0.041)
-9.82 21.52

a23_84 = - 0.11*f3, Errorvar.= 0.99 , R8 = 0.013
(0.036) (0.044)
-3.14 22.27

a24_85 = - 0.077*f3, Errorvar.= 0.99 , R8 = 0.0060
(0.036) (0.045)
-2.16 22.31

a25_86 = - 0.13*f3, Errorvar.= 0.98 , R8 = 0.016
(0.036) (0.044)
-3.60 22.24

a26_87 = 0.11*f3, Errorvar.= 0.99 , R8 = 0.012
(0.036) (0.044)
3.11 22.27

a27_88 = 0.59*f3, Errorvar.= 0.66 , R8 = 0.34
(0.033) (0.034)
17.95 19.04

a28_89 = 0.035*f3, Errorvar.= 1.00 , R8 = 0.0012
(0.036) (0.045)
0.99 22.34

a29_90 = - 0.14*f3, Errorvar.= 0.98 , R8 = 0.021
(0.036) (0.044)
-4.05 22.22

a30_91 = - 0.00018*f3, Errorvar.= 1.00 , R8 = 0.00
(0.036) (0.045)
-0.0051 22.35

Correlation Matrix of Independent Variables

f3
1.00

Goodness of Fit Statistics

Degrees of Freedom = 405
Minimum Fit Function Chi-Square = 5073.59 (P = 0.0)
Normal Theory Weighted Least Squares Chi-Square = 4110.35 (P = 0.0)
Estimated Non-centrality Parameter (NCP) = 3705.35
90 Percent Confidence Interval for NCP = (3503.28 ; 3914.74)

Minimum Fit Function Value = 5.08
Population Discrepancy Function Value (F0) = 3.71
90 Percent Confidence Interval for F0 = (3.51 ; 3.92)
Root Mean Square Error of Approximation (RMSEA) = 0.096
90 Percent Confidence Interval for RMSEA = (0.093 ; 0.098)
P-Value for Test of Close Fit (RMSEA < 0.05) = 0.00

Expected Cross-Validation Index (ECVI) = 4.23
90 Percent Confidence Interval for ECVI = (4.03 ; 4.44)
ECVI for Saturated Model = 0.93
ECVI for Independence Model = 7.31

Chi-Square for Independence Model with 435 Degrees of Freedom = 7241.86
Independence AIC = 7301.86
Model AIC = 4230.35
Saturated AIC = 930.00
Independence CAIC = 7479.09
Model CAIC = 4584.82
Saturated CAIC = 3677.11

Normed Fit Index (NFI) = 0.30
Non-Normed Fit Index (NNFI) = 0.26
Parsimony Normed Fit Index (PNFI) = 0.28
Comparative Fit Index (CFI) = 0.31
Incremental Fit Index (IFI) = 0.32
Relative Fit Index (RFI) = 0.25

Critical N (CN) = 94.36

Root Mean Square Residual (RMR) = 0.085
Standardized RMR = 0.085
Goodness of Fit Index (GFI) = 0.78
Adjusted Goodness of Fit Index (AGFI) = 0.75
Parsimony Goodness of Fit Index (PGFI) = 0.68

The Modification Indices Suggest to Add an Error Covariance

Between	and	Decrease in Chi-Square	New Estimate
a3_64	a1_62	9.7	0.10
a3_64	a2_63	15.1	0.12
a4_65	a1_62	53.6	0.21
a4_65	a2_63	24.9	-0.14
a4_65	a3_64	18.0	0.12
a5_66	a2_63	8.2	0.08
a5_66	a3_64	10.2	-0.09
a5_66	a4_65	73.5	0.23
a6_67	a1_62	39.7	-0.19
a6_67	a3_64	38.4	-0.19
a6_67	a4_65	8.5	0.08
a6_67	a5_66	45.1	0.19
a7_68	a2_63	8.8	0.08
a8_69	a3_64	11.3	0.10
a8_69	a4_65	27.8	-0.15
a8_69	a5_66	17.6	-0.12
a8_69	a7_68	17.2	-0.12
a9_70	a1_62	14.1	-0.11
a9_70	a5_66	32.5	-0.16
a9_70	a7_68	71.2	0.23
a10_71	a4_65	25.6	-0.14
a10_71	a8_69	8.0	0.09
a11_72	a1_62	15.5	0.12
a11_72	a5_66	11.0	-0.10
a11_72	a6_67	22.6	-0.14
a11_72	a7_68	12.3	-0.10
a12_73	a2_63	42.4	-0.19
a12_73	a3_64	11.9	0.10
a12_73	a5_66	16.5	-0.12
a12_73	a6_67	36.7	-0.18
a12_73	a7_68	107.6	-0.29
a12_73	a8_69	17.6	0.13
a12_73	a11_72	187.3	0.40
a13_74	a1_62	12.9	0.11
a13_74	a8_69	14.8	-0.12
a13_74	a10_71	13.9	-0.11
a14_75	a1_62	10.0	-0.10
a14_75	a5_66	90.6	-0.27
a14_75	a7_68	10.6	0.09
a14_75	a13_74	11.9	0.10
a15_76	a6_67	16.0	0.12
a15_76	a9_70	9.0	-0.08
a15_76	a12_73	21.5	0.13
a15_76	a13_74	34.6	0.17
a15_76	a14_75	10.5	0.09
a16_77	a1_62	16.9	-0.13
a16_77	a2_63	22.1	0.14
a16_77	a3_64	32.1	-0.17
a16_77	a4_65	22.6	-0.13

a16_77	a5_66	17.8	0.12
a16_77	a7_68	19.4	0.12
a16_77	a8_69	25.4	-0.16
a16_77	a9_70	15.4	-0.11
a16_77	a10_71	16.3	-0.12
a16_77	a11_72	87.7	-0.28
a16_77	a12_73	76.5	-0.26
a16_77	a15_76	14.5	0.11
a17_78	a1_62	12.5	0.11
a17_78	a2_63	9.2	0.09
a17_78	a3_64	23.3	-0.14
a17_78	a5_66	16.7	0.12
a17_78	a7_68	18.6	-0.12
a17_78	a8_69	13.4	0.11
a17_78	a9_70	40.5	-0.18
a17_78	a12_73	21.6	0.14
a17_78	a14_75	14.2	-0.11
a17_78	a16_77	9.5	0.09
a18_79	a1_62	10.4	0.10
a18_79	a2_63	20.5	-0.13
a18_79	a6_67	18.1	0.13
a18_79	a11_72	28.9	-0.16
a18_79	a12_73	8.5	-0.09
a18_79	a13_74	14.3	0.11
a18_79	a14_75	21.5	0.14
a18_79	a16_77	36.6	0.18
a19_80	a5_66	13.9	-0.11
a19_80	a6_67	34.6	-0.17
a19_80	a10_71	14.3	0.11
a19_80	a11_72	59.6	0.23
a19_80	a12_73	61.0	0.23
a19_80	a13_74	12.5	-0.10
a19_80	a16_77	19.9	-0.13
a19_80	a17_78	14.8	-0.11
a19_80	a18_79	29.9	-0.16
a20_81	a1_62	14.6	-0.12
a20_81	a3_64	11.8	-0.11
a20_81	a5_66	12.0	0.10
a20_81	a6_67	15.0	0.12
a20_81	a7_68	32.1	0.16
a20_81	a8_69	11.3	0.10
a20_81	a12_73	28.2	-0.16
a20_81	a13_74	14.5	0.12
a20_81	a16_77	16.5	-0.12
a20_81	a17_78	33.7	-0.17
a20_81	a19_80	16.8	-0.12
a21_82	a1_62	20.8	-0.13
a21_82	a6_67	11.5	-0.10
a21_82	a7_68	10.1	0.09
a21_82	a8_69	9.7	0.09
a21_82	a9_70	33.4	0.16
a21_82	a12_73	9.0	-0.09
a21_82	a15_76	43.1	-0.19
a22_83	a1_62	8.3	-0.09
a22_83	a5_66	31.8	0.16
a22_83	a6_67	23.0	-0.14
a22_83	a8_69	18.6	0.13
a22_83	a16_77	17.6	0.13

a22_83	a18_79	9.2	0.09
a22_83	a19_80	27.9	-0.15
a22_83	a20_81	24.2	0.15
a23_84	a4_65	16.4	0.12
a23_84	a5_66	7.9	-0.08
a23_84	a11_72	16.8	-0.13
a23_84	a12_73	11.9	0.10
a23_84	a13_74	12.7	-0.11
a24_85	a9_70	54.7	-0.21
a24_85	a11_72	11.7	-0.11
a24_85	a13_74	17.1	-0.13
a24_85	a15_76	10.6	0.10
a24_85	a16_77	29.4	0.17
a24_85	a21_82	17.9	0.13
a24_85	a22_83	44.4	0.20
a25_86	a3_64	10.3	0.10
a25_86	a7_68	26.0	-0.15
a25_86	a9_70	10.6	-0.09
a25_86	a10_71	21.9	0.14
a25_86	a12_73	10.4	0.10
a25_86	a16_77	10.6	0.10
a25_86	a19_80	11.8	0.10
a25_86	a20_81	17.7	-0.13
a25_86	a22_83	9.3	-0.09
a25_86	a24_85	26.5	0.16
a26_87	a6_67	12.4	0.11
a26_87	a7_68	18.1	-0.12
a26_87	a11_72	10.1	-0.10
a26_87	a13_74	14.3	0.12
a26_87	a15_76	13.0	-0.11
a26_87	a20_81	22.2	0.15
a26_87	a24_85	10.6	0.10
a27_88	a2_63	11.4	0.09
a27_88	a7_68	15.8	0.10
a27_88	a10_71	12.8	-0.10
a27_88	a11_72	11.7	-0.09
a27_88	a12_73	26.9	-0.14
a27_88	a16_77	20.1	-0.12
a27_88	a20_81	18.1	0.12
a27_88	a22_83	9.1	0.08
a27_88	a25_86	10.7	-0.09
a28_89	a1_62	24.5	-0.16
a28_89	a7_68	14.8	0.11
a28_89	a9_70	8.8	-0.09
a28_89	a11_72	26.8	0.16
a28_89	a12_73	18.1	0.13
a28_89	a16_77	35.4	-0.19
a28_89	a19_80	15.2	0.12
a28_89	a25_86	9.7	-0.10
a28_89	a27_88	10.4	0.09
a29_90	a1_62	16.0	-0.13
a29_90	a3_64	21.9	-0.14
a29_90	a4_65	10.3	-0.09
a29_90	a5_66	11.1	0.10
a29_90	a8_69	12.4	-0.11
a29_90	a9_70	26.3	-0.15
a29_90	a10_71	21.2	0.14
a29_90	a11_72	12.3	0.11

a29_90	a17_78	20.8	0.14
a29_90	a18_79	19.8	-0.14
a29_90	a20_81	24.4	0.15
a30_91	a4_65	17.7	-0.12
a30_91	a13_74	35.9	0.18
a30_91	a16_77	24.0	0.15
a30_91	a23_84	8.3	-0.09
a30_91	a29_90	10.7	-0.10

Time used: 0.453 Seconds

6. แสดงผลการวิเคราะห์องค์ประกอบเชิงยืนยันอันดับสองในแต่ละตัวแปรขององค์ประกอบความสามารถด้านจำนวน

DATE: 10/13/2009
TIME: 21:39

L I S R E L 8.72

BY

Karl G. J”reskog & Dag S”rbom

The following lines were read from file D:\จาก desktop\ครั้งที่ 2\f3\f3.SPJ:

TI f3
f3path
SYSTEM FILE from file 'C:\f3\f3.dsf'
Sample Size = 1000
Latent Variables f3
Relationships
a1_62 = f3
a2_63 = f3
a3_64 = f3
a4_65 = f3
a5_66 = f3
a6_67 = f3
a7_68 = f3
a8_69 = f3
a9_70 = f3
a10_71 = f3
a11_72 = f3

a12_73 = f3
a13_74 = f3
a14_75 = f3
a15_76 = f3
a16_77 = f3
a17_78 = f3
a18_79 = f3
a19_80 = f3
a20_81 = f3
a21_82 = f3
a22_83 = f3
a23_84 = f3
a24_85 = f3
a25_86 = f3
a26_87 = f3
a27_88 = f3
a28_89 = f3
a29_90 = f3
a30_91 = f3
Set the Variance of f3 to 1.00
Set the Error Covariance of a3_64 and a1_62 Free
Set the Error Covariance of a3_64 and a2_63 Free
Set the Error Covariance of a4_65 and a1_62 Free
Set the Error Covariance of a4_65 and a2_63 Free
Set the Error Covariance of a5_66 and a1_62 Free
Set the Error Covariance of a5_66 and a3_64 Free
Set the Error Covariance of a5_66 and a4_65 Free
Set the Error Covariance of a6_67 and a1_62 Free
Set the Error Covariance of a6_67 and a3_64 Free
Set the Error Covariance of a6_67 and a5_66 Free
Set the Error Covariance of a7_68 and a2_63 Free
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Set the Error Covariance of a19_80 and a11_72 Free
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Set the Error Covariance of a19_80 and a16_77 Free

Set the Error Covariance of a19_80 and a17_78 Free
Set the Error Covariance of a19_80 and a18_79 Free
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Set the Error Covariance of a20_81 and a3_64 Free
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Set the Error Covariance of a22_83 and a9_70 Free
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Set the Error Covariance of a23_84 and a21_82 Free
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Set the Error Covariance of a24_85 and a7_68 Free
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Set the Error Covariance of a24_85 and a9_70 Free
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Set the Error Covariance of a24_85 and a16_77 Free
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Set the Error Covariance of a25_86 and a7_68 Free
Set the Error Covariance of a25_86 and a8_69 Free
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Set the Error Covariance of a25_86 and a11_72 Free
Set the Error Covariance of a25_86 and a13_74 Free
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Set the Error Covariance of a25_86 and a24_85 Free
Set the Error Covariance of a26_87 and a1_62 Free
Set the Error Covariance of a26_87 and a6_67 Free
Set the Error Covariance of a26_87 and a7_68 Free
Set the Error Covariance of a26_87 and a11_72 Free
Set the Error Covariance of a26_87 and a12_73 Free
Set the Error Covariance of a26_87 and a13_74 Free
Set the Error Covariance of a26_87 and a15_76 Free
Set the Error Covariance of a26_87 and a16_77 Free
Set the Error Covariance of a26_87 and a18_79 Free
Set the Error Covariance of a26_87 and a19_80 Free
Set the Error Covariance of a26_87 and a20_81 Free
Set the Error Covariance of a26_87 and a22_83 Free
Set the Error Covariance of a26_87 and a24_85 Free
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Set the Error Covariance of a27_88 and a15_76 Free
Set the Error Covariance of a27_88 and a16_77 Free
Set the Error Covariance of a27_88 and a18_79 Free
Set the Error Covariance of a27_88 and a20_81 Free
Set the Error Covariance of a27_88 and a21_82 Free
Set the Error Covariance of a27_88 and a22_83 Free
Set the Error Covariance of a27_88 and a23_84 Free
Set the Error Covariance of a28_89 and a1_62 Free
Set the Error Covariance of a28_89 and a3_64 Free
Set the Error Covariance of a28_89 and a5_66 Free
Set the Error Covariance of a28_89 and a7_68 Free
Set the Error Covariance of a28_89 and a9_70 Free
Set the Error Covariance of a28_89 and a11_72 Free
Set the Error Covariance of a28_89 and a12_73 Free
Set the Error Covariance of a28_89 and a14_75 Free

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Set the Error Covariance of a28_89 and a16_77 Free
Set the Error Covariance of a28_89 and a19_80 Free
Set the Error Covariance of a28_89 and a25_86 Free
Set the Error Covariance of a28_89 and a27_88 Free
 Set the Error Covariance of a29_90 and a1_62 Free
 Set the Error Covariance of a29_90 and a3_64 Free
 Set the Error Covariance of a29_90 and a4_65 Free
 Set the Error Covariance of a29_90 and a5_66 Free
 Set the Error Covariance of a29_90 and a6_67 Free
 Set the Error Covariance of a29_90 and a8_69 Free
 Set the Error Covariance of a29_90 and a9_70 Free
Set the Error Covariance of a29_90 and a10_71 Free
Set the Error Covariance of a29_90 and a11_72 Free
Set the Error Covariance of a29_90 and a12_73 Free
Set the Error Covariance of a29_90 and a13_74 Free
Set the Error Covariance of a29_90 and a14_75 Free
Set the Error Covariance of a29_90 and a16_77 Free
Set the Error Covariance of a29_90 and a17_78 Free
Set the Error Covariance of a29_90 and a18_79 Free
Set the Error Covariance of a29_90 and a20_81 Free
Set the Error Covariance of a29_90 and a24_85 Free
 Set the Error Covariance of a30_91 and a1_62 Free
 Set the Error Covariance of a30_91 and a3_64 Free
 Set the Error Covariance of a30_91 and a4_65 Free
Set the Error Covariance of a30_91 and a13_74 Free
Set the Error Covariance of a30_91 and a16_77 Free
Set the Error Covariance of a30_91 and a17_78 Free
Set the Error Covariance of a30_91 and a18_79 Free
Set the Error Covariance of a30_91 and a19_80 Free
Set the Error Covariance of a30_91 and a20_81 Free
Set the Error Covariance of a30_91 and a23_84 Free
Set the Error Covariance of a30_91 and a24_85 Free
Set the Error Covariance of a30_91 and a28_89 Free
Set the Error Covariance of a30_91 and a29_90 Free
                  Path Diagram
                   Wide Print
                 End of Problem

              Sample Size =  1000

                     TI f3

                Covariance Matrix

     a1_62      a2_63      a3_64      a4_65      a5_66      a6_67
                a7_68      a8_69      a9_70     a10_71
--------   --------   --------   --------   --------   --------   ---
                -----   --------   --------   --------
                           a1_62       1.00
                     a2_63      -0.02       1.00
                a3_64       0.07       0.19       1.00
           a4_65       0.14       0.04       0.22       1.00
     a5_66      -0.07       0.21       0.02       0.41       1.00
     a6_67      -0.22       0.14      -0.11       0.22       0.30
                                1.00
     a7_68       0.00       0.23       0.18       0.27       0.20
                           0.16       1.00
```

```
    a8_69       -0.02        0.04        0.14       -0.06       -0.05
                 0.02       -0.03        1.00
    a9_70       -0.15        0.13        0.18        0.25        0.07
                 0.17        0.43        0.10        1.00
   a10_71       -0.08        0.07        0.00        0.03        0.09
          0.07        0.16        0.13        0.14        1.00
a11_72        0.09        0.10        0.07        0.13        0.03       -
          0.05        0.05        0.08        0.09        0.12
a12_73        0.03       -0.07        0.18        0.14        0.04       -
          0.07       -0.07        0.17        0.19        0.12
   a13_74        0.08        0.13        0.00        0.10        0.19
          0.11        0.14       -0.07        0.14       -0.02
   a14_75       -0.12        0.15        0.10        0.13       -0.11
          0.13        0.24        0.10        0.12        0.10
   a15_76       -0.10        0.06        0.07        0.18        0.13
          0.21        0.11        0.11        0.09        0.09
   a16_77       -0.15        0.20       -0.12       -0.01        0.21
          0.01        0.22       -0.12        0.00       -0.05
   a17_78        0.07        0.19       -0.05        0.24        0.25
          0.12        0.08        0.16        0.01        0.17
   a18_79        0.07       -0.03        0.11        0.19        0.16
          0.21        0.20        0.08        0.16        0.06
a19_80       -0.10        0.18        0.12        0.18        0.04       -
          0.07        0.22        0.06        0.18        0.20
   a20_81       -0.13        0.06       -0.06        0.13        0.17
          0.17        0.23        0.13        0.11        0.05
   a21_82       -0.17        0.18        0.17        0.18        0.14
          0.04        0.29        0.15        0.34        0.10
a22_83       -0.12        0.15        0.06        0.20        0.29       -
          0.03        0.13        0.17        0.10        0.13
   a23_84        0.01        0.02        0.06        0.16       -0.03
          0.01        0.08       -0.01        0.03       -0.01
   a24_85       -0.01        0.09        0.03       -0.02        0.01
          0.03        0.07        0.07       -0.16       -0.03
a25_86        0.02       -0.01        0.13        0.10        0.03       -
          0.02       -0.06        0.02       -0.02        0.18
   a26_87        0.07       -0.05       -0.01       -0.02        0.00
          0.07       -0.17       -0.06       -0.05       -0.06
a27_88        0.01       -0.11       -0.09       -0.28       -0.22       -
          0.21       -0.23       -0.06       -0.30       -0.25
a28_89       -0.15       -0.06        0.05       -0.03       -0.09       -
          0.04        0.08       -0.01       -0.10        0.03
a29_90       -0.14        0.10       -0.11       -0.01        0.15       -
          0.02        0.05       -0.09       -0.07        0.18
a30_91       -0.07        0.02       -0.07       -0.11       -0.01       -
          0.02        0.02       -0.02        0.01        0.05
```

Covariance Matrix

```
    a11_72      a12_73      a13_74      a14_75      a15_76      a16_77
                a17_78      a18_79      a19_80      a20_81
--------    --------    --------    --------    --------    --------    ---
                -----    --------    --------    --------
                         a11_72        1.00
                    a12_73        0.47        1.00
                a13_74        0.07        0.07        1.00
          a14_75        0.03        0.17        0.19        1.00
    a15_76        0.16        0.24        0.26        0.20        1.00
```

```
    a16_77      -0.21      -0.17       0.06       0.03       0.18
                                1.00
    a17_78       0.11       0.24       0.11       0.01       0.06
                              0.16       1.00
    a18_79      -0.07       0.02       0.19       0.22       0.06
                         0.24       0.15       1.00
a19_80       0.30       0.32      -0.01       0.05       0.08      -
                   0.06       0.01      -0.05       1.00
a20_81      -0.01      -0.09       0.16       0.02       0.01      -
          0.08      -0.10       0.12      -0.06       1.00
    a21_82       0.10       0.07       0.11       0.20      -0.02
          0.15       0.17       0.06       0.15       0.07
    a22_83       0.08       0.19       0.15       0.10       0.07
          0.19       0.12       0.19      -0.03       0.20
    a23_84      -0.09       0.14      -0.07       0.07       0.01
          0.04       0.05      -0.04       0.01       0.02
    a24_85      -0.08       0.02      -0.10      -0.04       0.12
          0.18       0.09       0.02      -0.06      -0.02
    a25_86       0.03       0.14       0.01      -0.04       0.10
          0.13       0.07       0.04       0.14      -0.11
    a26_87      -0.12      -0.09       0.08      -0.03      -0.14
          0.03      -0.01      -0.07      -0.09       0.12
a27_88      -0.23      -0.31      -0.15      -0.18      -0.25      -
          0.23      -0.25      -0.13      -0.25      -0.01
a28_89       0.15       0.11      -0.03       0.06      -0.01      -
          0.19      -0.02       0.01       0.10       0.02
a29_90       0.14       0.03      -0.03       0.10       0.02      -
          0.02       0.18      -0.09       0.07       0.18
    a30_91       0.00      -0.05       0.18       0.01      -0.04
          0.15       0.04       0.06      -0.05      -0.05

                        Covariance Matrix

    a21_82     a22_83     a23_84     a24_85     a25_86     a26_87
               a27_88     a28_89     a29_90     a30_91
--------   --------   --------   --------   --------   --------   ---
               -----   --------   --------   --------
                         a21_82       1.00
                    a22_83       0.11       1.00
               a23_84       0.12      -0.03       1.00
          a24_85       0.15       0.22       0.00       1.00
    a25_86       0.03      -0.04      -0.01       0.17       1.00
    a26_87      -0.04      -0.09       0.00       0.09       0.03
                              1.00
    a27_88      -0.20      -0.13      -0.11      -0.06      -0.15
                            0.03       1.00
a28_89      -0.05      -0.03      -0.05      -0.04      -0.10      -
                    0.04       0.10       1.00
    a29_90       0.09       0.06       0.02       0.08       0.06
               0.00      -0.12       0.02       1.00
a30_91       0.02       0.00      -0.09       0.05       0.01      -
          0.01       0.00       0.05      -0.10       1.00

       W_A_R_N_I_N_G: THETA-DELTA is not positive definite
```

W_A_R_N_I_N_G: The solution was found non-admissible after 50 iterations.
The following solution is preliminary and is provided only for the purpose of tracing the source of the problem.
Setting AD> 50 or AD=OFF may solve the problem

LISREL Estimates(Intermediate Solution)

Measurement Equations

a1_62 = 0.0021*f3, Errorvar.= 1.00 , R8 = 0.00
(0.037) (0.046)
0.056 21.78

a2_63 = - 0.44*f3, Errorvar.= 0.81 , R8 = 0.20
(0.037) (0.041)
-12.04 19.50

a3_64 = - 0.39*f3, Errorvar.= 0.86 , R8 = 0.15
(0.035) (0.043)
-11.10 19.78

a4_65 = - 0.56*f3, Errorvar.= 0.69 , R8 = 0.31
(0.036) (0.039)
-15.69 17.40

a5_66 = - 0.43*f3, Errorvar.= 0.81 , R8 = 0.19
(0.038) (0.038)
-11.26 21.43

a6_67 = - 0.34*f3, Errorvar.= 0.87 , R8 = 0.12
(0.036) (0.044)
-9.37 20.07

a7_68 = - 0.47*f3, Errorvar.= 0.76 , R8 = 0.23
(0.039) (0.041)
-12.12 18.70

a8_69 = - 0.38*f3, Errorvar.= 0.85 , R8 = 0.14
(0.037) (0.045)
-10.21 18.99

a9_70 = - 0.46*f3, Errorvar.= 0.78 , R8 = 0.21
(0.036) (0.044)
-12.78 18.01

a10_71 = - 0.30*f3, Errorvar.= 0.91 , R8 = 0.088
(0.036) (0.044)
-8.20 20.65

a11_72 = - 0.23*f3, Errorvar.= 0.94 , R8 = 0.052
(0.040) (0.043)
-5.67 22.08

```
a12_73 =  - 0.48*f3, Errorvar.= 0.79  , R8 = 0.22
           (0.039)             (0.043)
            -12.33               18.43

a13_74 =  - 0.27*f3, Errorvar.= 0.92  , R8 = 0.075
           (0.036)             (0.044)
            -7.51                21.09

a14_75 =  - 0.28*f3, Errorvar.= 0.93  , R8 = 0.076
           (0.037)             (0.044)
            -7.49                21.31

a15_76 =  - 0.25*f3, Errorvar.= 0.94  , R8 = 0.063
           (0.038)             (0.043)
            -6.67                21.69

a16_77 =  - 0.45*f3, Errorvar.= 0.78  , R8 = 0.21
           (0.037)             (0.043)
            -12.16               18.07

a17_78 =  - 0.41*f3, Errorvar.= 0.84  , R8 = 0.17
           (0.039)             (0.042)
            -10.57               19.99

a18_79 =  - 0.35*f3, Errorvar.= 0.87  , R8 = 0.12
           (0.039)             (0.045)
            -8.93                19.57

a19_80 =  - 0.37*f3, Errorvar.= 0.86  , R8 = 0.13
           (0.038)             (0.043)
            -9.70                20.05

a20_81 =  - 0.22*f3, Errorvar.= 0.96  , R8 = 0.049
           (0.040)             (0.044)
            -5.51                21.88

a21_82 =  - 0.37*f3, Errorvar.= 0.86  , R8 = 0.13
           (0.034)             (0.043)
            -10.61               20.00

a22_83 =  - 0.38*f3, Errorvar.= 0.86  , R8 = 0.15
           (0.037)             (0.042)
            -10.27               20.31

a23_84 =  - 0.045*f3, Errorvar.= 1.00  , R8 = 0.0020
           (0.033)              (0.045)
            -1.38                22.30

a24_85 =  - 0.054*f3, Errorvar.= 1.00  , R8 = 0.0029
           (0.034)              (0.044)
            -1.58                22.66

a25_86 =  - 0.24*f3, Errorvar.= 0.94  , R8 = 0.057
           (0.036)             (0.044)
            -6.58                21.27
```

a26_87 = 0.065*f3, Errorvar.= 1.00 , R8 = 0.0042
(0.034) (0.045)
1.91 22.37

a27_88 = 0.64*f3, Errorvar.= 0.59 , R8 = 0.41
(0.038) (0.038)
17.00 15.62

a28_89 = 0.060*f3, Errorvar.= 1.00 , R8 = 0.0036
(0.035) (0.045)
1.70 22.35

a29_90 = - 0.19*f3, Errorvar.= 0.97 , R8 = 0.035
(0.039) (0.045)
-4.81 21.71

a30_91 = 0.0098*f3, Errorvar.= 1.00 , R8 = 0.00
(0.033) (0.045)
0.29 22.43

Error Covariance for a3_64 and a1_62 = 0.072
(0.029)
2.47

Error Covariance for a3_64 and a2_63 = 0.0082
(0.030)
0.28

Error Covariance for a4_65 and a1_62 = 0.13
(0.025)
5.11

Error Covariance for a4_65 and a2_63 = -0.21
(0.022)
-9.47

Error Covariance for a5_66 and a1_62 = -0.08
(0.028)
-2.68

Error Covariance for a5_66 and a3_64 = -0.16
(0.026)
-6.25

Error Covariance for a5_66 and a4_65 = 0.16
(0.026)
5.90

Error Covariance for a6_67 and a1_62 = -0.21
(0.032)
-6.77

Error Covariance for a6_67 and a3_64 = -0.24
(0.028)
-8.65

Error Covariance for a6_67 and a5_66 = 0.16
(0.026)
5.95

Error Covariance for a7_68 and a2_63 = 0.033
(0.025)
1.28

Error Covariance for a8_69 and a2_63 = -0.13
(0.029)
-4.41

Error Covariance for a8_69 and a4_65 = -0.27
(0.028)
-9.43

Error Covariance for a8_69 and a5_66 = -0.22
(0.028)
-7.86

Error Covariance for a8_69 and a6_67 = -0.10
(0.029)
-3.58

Error Covariance for a8_69 and a7_68 = -0.22
(0.028)
-7.87

Error Covariance for a9_70 and a1_62 = -0.15
(0.026)
-5.63

Error Covariance for a9_70 and a2_63 = -0.09
(0.027)
-3.47

Error Covariance for a9_70 and a5_66 = -0.12
(0.020)
-6.06

Error Covariance for a9_70 and a7_68 = 0.19
(0.029)
6.70

Error Covariance for a9_70 and a8_69 = -0.08
(0.029)
-2.77

Error Covariance for a10_71 and a1_62 = -0.08
(0.027)
-2.81

Error Covariance for a10_71 and a2_63 = -0.07
(0.028)
-2.67

Error Covariance for a10_71 and a3_64 = -0.12

(0.030)
-4.04

Error Covariance for a10_71 and a4_65 = -0.12
(0.025)
-5.03

Error Covariance for a11_72 and a1_62 = 0.077
(0.026)
2.94

Error Covariance for a11_72 and a5_66 = -0.08
(0.024)
-3.44

Error Covariance for a11_72 and a6_67 = -0.12
(0.029)
-4.22

Error Covariance for a11_72 and a7_68 = -0.04
(0.025)
-1.78

Error Covariance for a12_73 and a2_63 = -0.29
(0.024)
-12.00

Error Covariance for a12_73 and a4_65 = -0.12
(0.022)
-5.59

Error Covariance for a12_73 and a5_66 = -0.16
(0.027)
-6.06

Error Covariance for a12_73 and a6_67 = -0.22
(0.028)
-7.93

Error Covariance for a12_73 and a7_68 = -0.29
(0.025)
-11.51

Error Covariance for a12_73 and a10_71 = -0.04
(0.024)
-1.68

Error Covariance for a12_73 and a11_72 = 0.37
(0.031)
11.66

Error Covariance for a13_74 and a1_62 = 0.077
(0.030)
2.60

Error Covariance for a13_74 and a3_64 = -0.11
(0.027)
-3.88

Error Covariance for a13_74 and a4_65 = -0.06
(0.027)
-2.37

Error Covariance for a13_74 and a5_66 = 0.065
(0.026)
2.50

Error Covariance for a13_74 and a8_69 = -0.18
(0.029)
-6.14

Error Covariance for a13_74 and a10_71 = -0.11
(0.026)
-4.02

Error Covariance for a13_74 and a12_73 = -0.05
(0.026)
-2.06

Error Covariance for a14_75 and a1_62 = -0.11
(0.029)
-4.00

Error Covariance for a14_75 and a5_66 = -0.24
(0.023)
-10.47

Error Covariance for a14_75 and a7_68 = 0.11
(0.025)
4.35

Error Covariance for a14_75 and a12_73 = 0.065
(0.025)
2.58

Error Covariance for a14_75 and a13_74 = 0.11
(0.029)
3.72

Error Covariance for a15_76 and a1_62 = -0.11
(0.028)
-4.01

Error Covariance for a15_76 and a2_63 = -0.05
(0.026)
-2.08

Error Covariance for a15_76 and a6_67 = 0.11
(0.027)
4.08

Error Covariance for a15_76 and a11_72 = 0.11
(0.027)
4.13

Error Covariance for a15_76 and a12_73 = 0.14

(0.028)
5.03

Error Covariance for a15_76 and a13_74 = 0.20
(0.029)
7.00

Error Covariance for a15_76 and a14_75 = 0.14
(0.028)
4.93

Error Covariance for a16_77 and a1_62 = -0.14
(0.030)
-4.70

Error Covariance for a16_77 and a3_64 = -0.30
(0.027)
-10.88

Error Covariance for a16_77 and a4_65 = -0.27
(0.024)
-11.55

Error Covariance for a16_77 and a6_67 = -0.14
(0.027)
-5.24

Error Covariance for a16_77 and a8_69 = -0.30
(0.029)
-10.29

Error Covariance for a16_77 and a9_70 = -0.20
(0.025)
-8.24

Error Covariance for a16_77 and a10_71 = -0.18
(0.027)
-6.77

Error Covariance for a16_77 and a11_72 = -0.31
(0.030)
-10.26

Error Covariance for a16_77 and a12_73 = -0.39
(0.029)
-13.15

Error Covariance for a16_77 and a13_74 = -0.05
(0.028)
-1.87

Error Covariance for a16_77 and a14_75 = -0.11
(0.026)
-4.10

Error Covariance for a16_77 and a15_76 = 0.070
(0.029)
2.40

Error Covariance for a17_78 and a1_62 = 0.062
(0.028)
2.21

Error Covariance for a17_78 and a3_64 = -0.23
(0.027)
-8.60

Error Covariance for a17_78 and a5_66 = 0.085
(0.025)
3.45

Error Covariance for a17_78 and a7_68 = -0.12
(0.026)
-4.54

Error Covariance for a17_78 and a9_70 = -0.18
(0.026)
-7.16

Error Covariance for a17_78 and a10_71 = 0.053
(0.028)
1.90

Error Covariance for a17_78 and a12_73 = 0.036
(0.027)
1.34

Error Covariance for a17_78 and a14_75 = -0.12
(0.028)
-4.35

Error Covariance for a17_78 and a15_76 = -0.04
(0.025)
-1.57

Error Covariance for a18_79 and a1_62 = 0.070
(0.030)
2.34

Error Covariance for a18_79 and a2_63 = -0.19
(0.025)
-7.33

Error Covariance for a18_79 and a6_67 = 0.074
(0.028)
2.62

Error Covariance for a18_79 and a8_69 = -0.05
(0.029)
-1.87

Error Covariance for a18_79 and a10_71 = -0.04
(0.028)
-1.58

Error Covariance for a18_79 and a11_72 = -0.14

(0.029)
-4.94

Error Covariance for a18_79 and a12_73 = -0.12
(0.028)
-4.39

Error Covariance for a18_79 and a13_74 = 0.098
(0.029)
3.38

Error Covariance for a18_79 and a14_75 = 0.12
(0.029)
4.25

Error Covariance for a18_79 and a16_77 = 0.087
(0.030)
2.91

Error Covariance for a19_80 and a1_62 = -0.11
(0.028)
-3.93

Error Covariance for a19_80 and a5_66 = -0.12
(0.025)
-4.75

Error Covariance for a19_80 and a6_67 = -0.18
(0.028)
-6.52

Error Covariance for a19_80 and a7_68 = 0.055
(0.026)
2.11

Error Covariance for a19_80 and a8_69 = -0.08
(0.028)
-2.77

Error Covariance for a19_80 and a10_71 = 0.074
(0.028)
2.67

Error Covariance for a19_80 and a11_72 = 0.21
(0.030)
7.11

Error Covariance for a19_80 and a12_73 = 0.15
(0.030)
4.98

Error Covariance for a19_80 and a13_74 = -0.11
(0.027)
-3.96

Error Covariance for a19_80 and a16_77 = -0.23
(0.028)
-8.24

Error Covariance for a19_80 and a17_78 = -0.15
(0.028)
-5.52

Error Covariance for a19_80 and a18_79 = -0.16
(0.028)
-5.89

Error Covariance for a20_81 and a1_62 = -0.12
(0.031)
-4.03

Error Covariance for a20_81 and a3_64 = -0.15
(0.028)
-5.29

Error Covariance for a20_81 and a5_66 = 0.076
(0.027)
2.84

Error Covariance for a20_81 and a6_67 = 0.082
(0.029)
2.88

Error Covariance for a20_81 and a7_68 = 0.13
(0.027)
4.87

Error Covariance for a20_81 and a8_69 = 0.038
(0.030)
1.28

Error Covariance for a20_81 and a11_72 = -0.06
(0.028)
-2.15

Error Covariance for a20_81 and a12_73 = -0.21
(0.030)
-6.94

Error Covariance for a20_81 and a13_74 = 0.089
(0.029)
3.12

Error Covariance for a20_81 and a14_75 = -0.05
(0.028)
-1.78

Error Covariance for a20_81 and a15_76 = -0.05
(0.028)
-1.74

Error Covariance for a20_81 and a16_77 = -0.19
(0.027)
-6.82

Error Covariance for a20_81 and a17_78 = -0.20

(0.029)
-6.87

Error Covariance for a20_81 and a19_80 = -0.14
(0.030)
-4.67

Error Covariance for a21_82 and a1_62 = -0.17
(0.028)
-6.01

Error Covariance for a21_82 and a6_67 = -0.09
(0.025)
-3.47

Error Covariance for a21_82 and a7_68 = 0.11
(0.027)
4.15

Error Covariance for a21_82 and a9_70 = 0.16
(0.030)
5.29

Error Covariance for a21_82 and a11_72 = 0.013
(0.026)
0.52

Error Covariance for a21_82 and a12_73 = -0.10
(0.025)
-4.23

Error Covariance for a21_82 and a14_75 = 0.096
(0.028)
3.44

Error Covariance for a21_82 and a15_76 = -0.11
(0.026)
-4.34

Error Covariance for a21_82 and a18_79 = -0.07
(0.026)
-2.59

Error Covariance for a22_83 and a1_62 = -0.11
(0.029)
-3.85

Error Covariance for a22_83 and a3_64 = -0.08
(0.027)
-3.12

Error Covariance for a22_83 and a5_66 = 0.13
(0.026)
4.82

Error Covariance for a22_83 and a6_67 = -0.17
(0.029)
-5.72

Error Covariance for a22_83 and a7_68 = -0.05
(0.026)
-1.92

Error Covariance for a22_83 and a9_70 = -0.07
(0.025)
-2.63

Error Covariance for a22_83 and a12_73 = 0.018
(0.026)
0.70

Error Covariance for a22_83 and a13_74 = 0.048
(0.029)
1.65

Error Covariance for a22_83 and a15_76 = -0.04
(0.027)
-1.36

Error Covariance for a22_83 and a17_78 = -0.04
(0.028)
-1.50

Error Covariance for a22_83 and a18_79 = 0.036
(0.027)
1.35

Error Covariance for a22_83 and a19_80 = -0.16
(0.028)
-5.84

Error Covariance for a22_83 and a20_81 = 0.13
(0.029)
4.33

Error Covariance for a23_84 and a3_64 = 0.052
(0.028)
1.85

Error Covariance for a23_84 and a4_65 = 0.13
(0.031)
4.13

Error Covariance for a23_84 and a5_66 = -0.06
(0.027)
-2.16

Error Covariance for a23_84 and a7_68 = 0.053
(0.023)
2.31

Error Covariance for a23_84 and a11_72 = -0.09
(0.027)
-3.35

Error Covariance for a23_84 and a12_73 = 0.12

(0.027)
4.42

Error Covariance for a23_84 and a13_74 = -0.09
(0.029)
-3.12

Error Covariance for a23_84 and a14_75 = 0.070
(0.030)
2.35

Error Covariance for a23_84 and a18_79 = -0.05
(0.028)
-1.95

Error Covariance for a23_84 and a21_82 = 0.099
(0.028)
3.56

Error Covariance for a23_84 and a22_83 = -0.04
(0.028)
-1.54

Error Covariance for a24_85 and a2_63 = 0.083
(0.028)
3.02

Error Covariance for a24_85 and a4_65 = -0.05
(0.023)
-2.26

Error Covariance for a24_85 and a7_68 = 0.053
(0.028)
1.91

Error Covariance for a24_85 and a8_69 = 0.047
(0.029)
1.63

Error Covariance for a24_85 and a9_70 = -0.18
(0.029)
-6.27

Error Covariance for a24_85 and a10_71 = -0.05
(0.026)
-1.77

Error Covariance for a24_85 and a11_72 = -0.08
(0.024)
-3.53

Error Covariance for a24_85 and a13_74 = -0.11
(0.028)
-3.80

Error Covariance for a24_85 and a14_75 = -0.07
(0.028)
-2.55

Error Covariance for a24_85 and a15_76 = 0.092
(0.026)
3.47

Error Covariance for a24_85 and a16_77 = 0.14
(0.025)
5.64

Error Covariance for a24_85 and a17_78 = 0.064
(0.027)
2.40

Error Covariance for a24_85 and a19_80 = -0.08
(0.027)
-2.88

Error Covariance for a24_85 and a21_82 = 0.14
(0.028)
4.83

Error Covariance for a24_85 and a22_83 = 0.22
(0.027)
7.99

Error Covariance for a25_86 and a2_63 = -0.12
(0.030)
-4.13

Error Covariance for a25_86 and a3_64 = 0.036
(0.029)
1.24

Error Covariance for a25_86 and a5_66 = -0.05
(0.025)
-1.92

Error Covariance for a25_86 and a6_67 = -0.08
(0.027)
-2.91

Error Covariance for a25_86 and a7_68 = -0.16
(0.029)
-5.64

Error Covariance for a25_86 and a8_69 = -0.06
(0.030)
-2.08

Error Covariance for a25_86 and a9_70 = -0.12
(0.029)
-4.25

Error Covariance for a25_86 and a10_71 = 0.12
(0.029)
4.14

Error Covariance for a25_86 and a11_72 = -0.04

(0.023)
-1.70

Error Covariance for a25_86 and a13_74 = -0.07
(0.028)
-2.45

Error Covariance for a25_86 and a14_75 = -0.10
(0.028)
-3.60

Error Covariance for a25_86 and a19_80 = 0.051
(0.029)
1.75

Error Covariance for a25_86 and a20_81 = -0.15
(0.029)
-5.16

Error Covariance for a25_86 and a21_82 = -0.05
(0.028)
-1.82

Error Covariance for a25_86 and a22_83 = -0.13
(0.029)
-4.67

Error Covariance for a25_86 and a24_85 = 0.13
(0.030)
4.33

Error Covariance for a26_87 and a1_62 = 0.067
(0.029)
2.27

Error Covariance for a26_87 and a6_67 = 0.087
(0.028)
3.08

Error Covariance for a26_87 and a7_68 = -0.12
(0.025)
-4.75

Error Covariance for a26_87 and a11_72 = -0.10
(0.029)
-3.56

Error Covariance for a26_87 and a12_73 = -0.06
(0.029)
-2.23

Error Covariance for a26_87 and a13_74 = 0.093
(0.029)
3.23

Error Covariance for a26_87 and a15_76 = -0.13
(0.029)
-4.54

Error Covariance for a26_87 and a16_77 = 0.042
(0.028)
1.50

Error Covariance for a26_87 and a18_79 = -0.06
(0.029)
-1.97

Error Covariance for a26_87 and a19_80 = -0.05
(0.030)
-1.79

Error Covariance for a26_87 and a20_81 = 0.16
(0.029)
5.33

Error Covariance for a26_87 and a22_83 = -0.05
(0.029)
-1.83

Error Covariance for a26_87 and a24_85 = 0.094
(0.029)
3.30

Error Covariance for a27_88 and a2_63 = 0.18
(0.024)
7.42

Error Covariance for a27_88 and a3_64 = 0.17
(0.024)
6.86

Error Covariance for a27_88 and a4_65 = 0.078
(0.025)
3.10

Error Covariance for a27_88 and a5_66 = 0.035
(0.024)
1.45

Error Covariance for a27_88 and a7_68 = 0.078
(0.021)
3.74

Error Covariance for a27_88 and a8_69 = 0.18
(0.025)
7.35

Error Covariance for a27_88 and a10_71 = -0.06
(0.025)
-2.56

Error Covariance for a27_88 and a11_72 = -0.09
(0.025)
-3.56

Error Covariance for a27_88 and a15_76 = -0.09

(0.024)
-3.81

Error Covariance for a27_88 and a16_77 = 0.061
(0.031)
2.01

Error Covariance for a27_88 and a18_79 = 0.076
(0.025)
3.01

Error Covariance for a27_88 and a20_81 = 0.13
(0.026)
5.27

Error Covariance for a27_88 and a21_82 = 0.038
(0.025)
1.54

Error Covariance for a27_88 and a22_83 = 0.11
(0.023)
4.77

Error Covariance for a27_88 and a23_84 = -0.08
(0.027)
-2.83

Error Covariance for a28_89 and a1_62 = -0.16
(0.029)
-5.57

Error Covariance for a28_89 and a3_64 = 0.088
(0.029)
3.02

Error Covariance for a28_89 and a5_66 = -0.07
(0.023)
-2.91

Error Covariance for a28_89 and a7_68 = 0.11
(0.027)
4.21

Error Covariance for a28_89 and a9_70 = -0.06
(0.027)
-2.37

Error Covariance for a28_89 and a11_72 = 0.15
(0.030)
5.17

Error Covariance for a28_89 and a12_73 = 0.15
(0.027)
5.41

Error Covariance for a28_89 and a14_75 = 0.080
(0.028)
2.87

Error Covariance for a28_89 and a16_77 = -0.14
(0.029)
-4.87

Error Covariance for a28_89 and a19_80 = 0.13
(0.030)
4.28

Error Covariance for a28_89 and a25_86 = -0.09
(0.029)
-3.07

Error Covariance for a28_89 and a27_88 = 0.060
(0.025)
2.36

Error Covariance for a29_90 and a1_62 = -0.13
(0.031)
-4.23

Error Covariance for a29_90 and a3_64 = -0.19
(0.029)
-6.44

Error Covariance for a29_90 and a4_65 = -0.10
(0.027)
-3.70

Error Covariance for a29_90 and a5_66 = 0.083
(0.028)
2.95

Error Covariance for a29_90 and a6_67 = -0.07
(0.029)
-2.40

Error Covariance for a29_90 and a8_69 = -0.17
(0.029)
-5.80

Error Covariance for a29_90 and a9_70 = -0.14
(0.025)
-5.67

Error Covariance for a29_90 and a10_71 = 0.13
(0.028)
4.47

Error Covariance for a29_90 and a11_72 = 0.091
(0.027)
3.33

Error Covariance for a29_90 and a12_73 = -0.07
(0.026)
-2.76

Error Covariance for a29_90 and a13_74 = -0.08

(0.029)
-2.67

Error Covariance for a29_90 and a14_75 = 0.045
(0.028)
1.62

Error Covariance for a29_90 and a16_77 = -0.10
(0.029)
-3.36

Error Covariance for a29_90 and a17_78 = 0.093
(0.031)
3.04

Error Covariance for a29_90 and a18_79 = -0.15
(0.029)
-5.29

Error Covariance for a29_90 and a20_81 = 0.15
(0.029)
5.31

Error Covariance for a29_90 and a24_85 = 0.076
(0.028)
2.74

Error Covariance for a30_91 and a1_62 = -0.07
(0.030)
-2.46

Error Covariance for a30_91 and a3_64 = -0.07
(0.030)
-2.20

Error Covariance for a30_91 and a4_65 = -0.10
(0.026)
-3.99

Error Covariance for a30_91 and a13_74 = 0.19
(0.029)
6.57

Error Covariance for a30_91 and a16_77 = 0.15
(0.028)
5.27

Error Covariance for a30_91 and a17_78 = 0.061
(0.027)
2.24

Error Covariance for a30_91 and a18_79 = 0.057
(0.028)
2.06

Error Covariance for a30_91 and a19_80 = -0.06
(0.026)
-2.31

Error Covariance for a30_91 and a20_81 = -0.06
(0.027)
-2.20

Error Covariance for a30_91 and a23_84 = -0.09
(0.029)
-3.93

Error Covariance for a30_91 and a24_85 = 0.060
(0.026)
2.30

Error Covariance for a30_91 and a28_89 = 0.060
(0.029)
2.06

Error Covariance for a30_91 and a29_90 = -0.12
(0.029)
-3.98

Correlation Matrix of Independent Variables

f3
1.00

Goodness of Fit Statistics

Degrees of Freedom = 159
Minimum Fit Function Chi-Square = 93.65 (P = 1.00)
Normal Theory Weighted Least Squares Chi-Square = 93.28 (P = 1.00)
Estimated Non-centrality Parameter (NCP) = 0.0
90 Percent Confidence Interval for NCP = (0.0 ; 0.0)

Minimum Fit Function Value = 0.094
Population Discrepancy Function Value (F0) = 0.0
90 Percent Confidence Interval for F0 = (0.0 ; 0.0)
Root Mean Square Error of Approximation (RMSEA) = 0.0
90 Percent Confidence Interval for RMSEA = (0.0 ; 0.0)
P-Value for Test of Close Fit (RMSEA < 0.05) = 1.00

Expected Cross-Validation Index (ECVI) = 0.77
90 Percent Confidence Interval for ECVI = (0.77 ; 0.77)
ECVI for Saturated Model = 0.93
ECVI for Independence Model = 7.31

Chi-Square for Independence Model with 435 Degrees of Freedom = 7241.86
Independence AIC = 7301.86
Model AIC = 705.28
Saturated AIC = 930.00
Independence CAIC = 7479.09
Model CAIC = 2513.05

Saturated CAIC = 3677.11

Normed Fit Index (NFI) = 0.99
Non-Normed Fit Index (NNFI) = 1.03
Parsimony Normed Fit Index (PNFI) = 0.36
Comparative Fit Index (CFI) = 1.00
Incremental Fit Index (IFI) = 1.01
Relative Fit Index (RFI) = 0.96

Critical N (CN) = 2170.78

Root Mean Square Residual (RMR) = 0.015
Standardized RMR = 0.015
Goodness of Fit Index (GFI) = 0.99
Adjusted Goodness of Fit Index (AGFI) = 0.98
Parsimony Goodness of Fit Index (PGFI) = 0.34

Time used: 0.563 Seconds

7. แสดงผลการวิเคราะห์องค์ประกอบเชิงยืนยันอันดับแรกในแต่ละตัวแปรขององค์ประกอบความสามารถด้านคิดวิเคราะห์

DATE: 10/13/2009
TIME: 21:31

L I S R E L 8.72

BY

Karl G. J”reskog & Dag S”rbom

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The following lines were read from file D:\จาก desktop\ครั้งที่ 1\f4\f4.SPJ:

TI f4
SYSTEM FILE from file 'D:\จาก desktop\ครั้งที่ 1\f4\f4.DSF'
Sample Size = 1000
Latent Variables f4
Relationships
a1_92 = f4
a2_93 = f4

a3_94 = f4
a4_95 = f4
a5_96 = f4
a6_97 = f4
a7_98 = f4
a8_99 = f4
a9_100 = f4
a10_101 = f4
a11_102 = f4
a12_103 = f4
a13_104 = f4
a14_105 = f4
a15_106 = f4
a16_107 = f4
a17_108 = f4
a18_109 = f4
a19_110 = f4
a20_111 = f4
a21_112 = f4
a22_113 = f4
a23_114 = f4
a24_115 = f4
a25_116 = f4
a26_117 = f4
a27_118 = f4
a28_119 = f4
a29_120 = f4
a30_121 = f4
Set the Variance of f4 to 1.00
Path Diagram
Wide Print
End of Problem

Sample Size = 1000

TI f4

Covariance Matrix

	a1_92	a2_93	a3_94	a4_95	a5_96	a6_97	a7_98	a8_99	a9_100	a10_101
a1_92	0.12									
a2_93	-0.01	0.23								
a3_94	0.00	-0.01	0.08							
a4_95	0.00	-0.02	0.01	0.17						
a5_96	-0.01	0.04	-0.02	-0.02	0.19					
a6_97	0.00	0.03	-0.01	-0.02	0.02	0.25				
a7_98	0.01	-0.03	0.01	0.00	-0.02	-0.02	0.13			
a8_99	0.01	-0.02	0.01	0.01	-0.03	-0.01	0.01	0.12		
a9_100	0.00	-0.01	0.00	0.01	-0.01	-0.01	0.00	0.00	0.08	
a10_101	0.00	-0.01	0.01	0.00	-0.02	-0.01	0.01	0.01	0.00	0.07

a11_102	0.00	-0.01	0.00	0.00	-0.01	-0.01
	0.01	0.01	0.00			
a12_103	0.00	-0.01	0.00	0.01	-0.01	-0.01
	0.01	0.01	0.00			
a13_104	0.01	-0.02	0.00	0.01	-0.02	-0.01
	0.02	0.00	0.00			
a14_105	0.00	0.00	0.00	0.00	-0.01	-0.02
	0.00	0.00	0.00			
a15_106	0.00	-0.01	0.00	0.01	-0.02	-0.01
	0.01	0.01	0.00			
a16_107	0.00	-0.01	0.01	0.00	-0.01	0.00
	0.01	0.00	0.01			
a17_108	0.00	-0.01	0.00	0.01	0.00	-0.01
	0.00	0.01	0.01			
a18_109	-0.01	0.03	-0.01	-0.01	0.03	0.02
	-0.01	-0.01	0.00			
a19_110	0.00	-0.01	0.00	0.00	-0.01	0.00
	0.00	0.00	0.00			
a20_111	0.00	-0.01	0.00	0.00	-0.01	-0.01
	0.01	0.01	0.00			
a21_112	0.00	0.00	0.00	-0.01	0.00	0.00
	0.01	0.01	0.00			
a22_113	-0.01	0.03	-0.01	-0.01	0.04	0.03
	-0.02	-0.03	-0.01			
a23_114	0.00	-0.01	0.00	0.00	-0.01	0.00
	0.00	0.00	0.00			
a24_115	0.00	-0.02	0.01	0.01	0.00	0.00
	0.00	0.01	0.01			
a25_116	0.00	-0.01	0.00	0.01	-0.01	-0.01
	0.01	0.01	0.00			
a26_117	0.00	0.01	0.00	0.00	0.01	0.01
	-0.01	0.00	-0.01			
a27_118	0.00	0.03	-0.01	-0.01	0.02	0.00
	-0.01	-0.02	0.00			
a28_119	0.01	-0.01	0.01	0.01	-0.01	-0.01
	0.00	0.00	0.01			
a29_120	-0.01	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.01			
a30_121	0.00	-0.01	0.00	0.01	-0.01	-0.01
	0.00	0.01	0.00	0.00		

Covariance Matrix

	a11_102	a12_103	a13_104	a14_105	a15_106	a16_107	a17_108	a18_109	a19_110	a20_111
a11_102	0.06									
a12_103	0.01	0.11								
a13_104	0.01	0.01	0.09							
a14_105	0.00	0.00	0.00	0.09						
a15_106	0.01	0.00	0.00	0.01	0.14					
a16_107	0.00	0.01	0.01	0.00	0.00	0.13				
a17_108	0.00	0.00	0.00	0.01	0.01	0.00	0.14			
a18_109	-0.01	-0.02	-0.02	-0.02	-0.01	-0.01	-0.02	0.21		

```
    a19_110       0.00        0.01        0.00        0.01        0.01
                  0.01        0.00       -0.02        0.07
    a20_111       0.01        0.01        0.01        0.01        0.01
           0.01        0.01       -0.02        0.01        0.10
    a21_112       0.00        0.00        0.01        0.00        0.00
           0.00        0.00        0.00        0.00        0.00
a22_113       -0.02       -0.01       -0.01       -0.02       -0.02       -
           0.01       -0.01        0.05       -0.01       -0.04
    a23_114       0.00        0.00        0.00        0.00        0.00
           0.01        0.00       -0.02        0.01        0.01
    a24_115       0.01        0.00        0.00        0.00        0.01
           0.01        0.00       -0.02        0.00        0.00
    a25_116       0.01        0.00        0.01       -0.01        0.01
           0.00        0.00       -0.01        0.00        0.00
    a26_117       -0.01       -0.01        0.00        0.00        0.00
           0.00       -0.01        0.01        0.00       -0.01
a27_118       -0.01       -0.01       -0.01       -0.01       -0.01       -
           0.01       -0.01        0.02        0.00       -0.02
    a28_119       0.00        0.00       -0.01        0.00        0.00
           0.01        0.01       -0.01        0.01        0.00
a29_120        0.00        0.00       -0.01        0.00        0.00       -
           0.01        0.00        0.00        0.00        0.01
    a30_121       0.01        0.01        0.00        0.00        0.00
           0.00        0.00        0.01        0.00       -0.01

                        Covariance Matrix

    a21_112    a22_113    a23_114    a24_115    a25_116    a26_117
               a27_118    a28_119    a29_120    a30_121
--------   --------   --------   --------   --------   --------   ---
                -----   --------   --------   --------   --------
                        a21_112        0.14
                a22_113        0.00        0.22
                a23_114        0.00       -0.02        0.08
          a24_115       -0.01       -0.02        0.00        0.17
    a25_116       0.00       -0.03        0.00        0.01        0.19
    a26_117       0.00        0.02        0.00       -0.01       -0.02
                                0.20
    a27_118       0.00        0.03        0.00       -0.02       -0.02
                            0.01        0.22
    a28_119       0.00       -0.02        0.01        0.02        0.00
                        0.00       -0.01        0.13
    a29_120       0.00       -0.01        0.00        0.00       -0.01
                  0.00       -0.02        0.00        0.21
    a30_121       0.00       -0.01        0.00        0.00        0.00
           0.00       -0.01        0.00        0.00        0.15


                              TI f4

                  Number of Iterations =  9

              LISREL Estimates (Maximum Likelihood)

                        Measurement Equations
```

```
a1_92 = 0.036*f4, Errorvar.= 0.12   , R8 = 0.011
          (0.013)              (0.0052)
            2.78                 22.23

a2_93 =  - 0.18*f4, Errorvar.= 0.20   , R8 = 0.14
          (0.018)             (0.0097)
           -9.92                20.70

a3_94 = 0.072*f4, Errorvar.= 0.077  , R8 = 0.064
          (0.011)              (0.0035)
            6.67                 21.64

a4_95 = 0.068*f4, Errorvar.= 0.16   , R8 = 0.028
          (0.016)              (0.0073)
            4.39                 22.05

a5_96 =  - 0.19*f4, Errorvar.= 0.16   , R8 = 0.19
          (0.016)             (0.0080)
           -11.68               19.97

a6_97 =  - 0.12*f4, Errorvar.= 0.23   , R8 = 0.061
          (0.019)              (0.011)
            -6.54                21.67

 a7_98 = 0.11*f4, Errorvar.= 0.12   , R8 = 0.084
          (0.014)             (0.0058)
            7.72                 21.39

 a8_99 = 0.11*f4, Errorvar.= 0.11   , R8 = 0.10
          (0.013)              (0.0052)
            8.47                 21.18

a9_100 = 0.043*f4, Errorvar.= 0.080  , R8 = 0.022
          (0.011)              (0.0036)
            3.91                 22.11

a10_101 = 0.072*f4, Errorvar.= 0.064  , R8 = 0.076
          (0.0099)             (0.0030)
            7.29                 21.50

a11_102 = 0.076*f4, Errorvar.= 0.051  , R8 = 0.10
          (0.0089)             (0.0024)
            8.52                 21.17

a12_103 = 0.073*f4, Errorvar.= 0.11   , R8 = 0.047
          (0.013)              (0.0049)
            5.73                 21.83

a13_104 = 0.079*f4, Errorvar.= 0.080  , R8 = 0.072
          (0.011)              (0.0037)
            7.12                 21.54

a14_105 = 0.055*f4, Errorvar.= 0.083  , R8 = 0.035
          (0.011)              (0.0038)
            4.92                 21.97
```

a15_106 = 0.079*f4, Errorvar.= 0.14 , R8 = 0.043
(0.014) (0.0063)
5.48 21.88

a16_107 = 0.059*f4, Errorvar.= 0.13 , R8 = 0.027
(0.014) (0.0058)
4.29 22.06

a17_108 = 0.038*f4, Errorvar.= 0.14 , R8 = 0.011
(0.014) (0.0061)
2.69 22.24

a18_109 = - 0.19*f4, Errorvar.= 0.17 , R8 = 0.17
(0.017) (0.0085)
-11.08 20.24

a19_110 = 0.054*f4, Errorvar.= 0.066 , R8 = 0.043
(0.010) (0.0030)
5.44 21.89

a20_111 = 0.097*f4, Errorvar.= 0.092 , R8 = 0.093
(0.012) (0.0043)
8.11 21.28

a21_112 = 0.011*f4, Errorvar.= 0.14 , R8 = 0.00088
(0.014) (0.0064)
0.78 22.34

a22_113 = - 0.23*f4, Errorvar.= 0.17 , R8 = 0.24
(0.017) (0.0088)
-13.43 19.05

a23_114 = 0.057*f4, Errorvar.= 0.078 , R8 = 0.041
(0.011) (0.0036)
5.31 21.91

a24_115 = 0.071*f4, Errorvar.= 0.17 , R8 = 0.029
(0.016) (0.0077)
4.48 22.04

a25_116 = 0.080*f4, Errorvar.= 0.18 , R8 = 0.034
(0.017) (0.0083)
4.83 21.99

a26_117 = - 0.070*f4, Errorvar.= 0.19 , R8 = 0.025
(0.017) (0.0088)
-4.13 22.09

a27_118 = - 0.13*f4, Errorvar.= 0.20 , R8 = 0.082
(0.018) (0.0095)
-7.60 21.42

a28_119 = 0.058*f4, Errorvar.= 0.12 , R8 = 0.027
(0.014) (0.0056)

4.28 22.07

a29_120 = 0.011*f4, Errorvar.= 0.21 , R8 = 0.00059
(0.018) (0.0094)
0.63 22.34

a30_121 = 0.033*f4, Errorvar.= 0.15 , R8 = 0.0069
(0.015) (0.0069)
2.17 22.28

Correlation Matrix of Independent Variables

f4
1.00

Goodness of Fit Statistics

Degrees of Freedom = 405
Minimum Fit Function Chi-Square = 579.60 (P = 0.00)
Normal Theory Weighted Least Squares Chi-Square = 596.93 (P = 0.00)
Estimated Non-centrality Parameter (NCP) = 191.93
90 Percent Confidence Interval for NCP = (130.56 ; 261.29)

Minimum Fit Function Value = 0.58
Population Discrepancy Function Value (F0) = 0.19
90 Percent Confidence Interval for F0 = (0.13 ; 0.26)
Root Mean Square Error of Approximation (RMSEA) = 0.022
90 Percent Confidence Interval for RMSEA = (0.018 ; 0.025)
P-Value for Test of Close Fit (RMSEA < 0.05) = 1.00

Expected Cross-Validation Index (ECVI) = 0.72
90 Percent Confidence Interval for ECVI = (0.66 ; 0.79)
ECVI for Saturated Model = 0.93
ECVI for Independence Model = 2.26

Chi-Square for Independence Model with 435 Degrees of Freedom = 2199.76
Independence AIC = 2259.76
Model AIC = 716.93
Saturated AIC = 930.00
Independence CAIC = 2436.99
Model CAIC = 1071.39
Saturated CAIC = 3677.11

Normed Fit Index (NFI) = 0.74
Non-Normed Fit Index (NNFI) = 0.89
Parsimony Normed Fit Index (PNFI) = 0.69
Comparative Fit Index (CFI) = 0.90
Incremental Fit Index (IFI) = 0.90
Relative Fit Index (RFI) = 0.72

Critical N (CN) = 818.22

Root Mean Square Residual (RMR) = 0.0045
Standardized RMR = 0.033
Goodness of Fit Index (GFI) = 0.96
Adjusted Goodness of Fit Index (AGFI) = 0.96
Parsimony Goodness of Fit Index (PGFI) = 0.84

The Modification Indices Suggest to Add an Error Covariance

Between	and	Decrease in Chi-Square	New Estimate
a5_96	a3_94	8.6	-0.01
a22_113	a2_93	9.7	-0.02
a22_113	a20_111	22.6	-0.02
a23_114	a10_101	10.9	0.01
a23_114	a11_102	8.9	-0.01
a23_114	a18_109	14.5	-0.01
a26_117	a10_101	9.5	0.01
a28_119	a11_102	9.2	-0.01
a28_119	a13_104	10.1	-0.01
a30_121	a20_111	11.0	-0.01

Time used: 0.234 Seconds

8. แสดงผลการวิเคราะห์องค์ประกอบเชิงยืนยันอันดับสองในแต่ละตัวแปรขององค์ประกอบความสามารถด้านคิดวิเคราะห์

DATE: 10/13/2009
TIME: 21:43

L I S R E L 8.72

BY

Karl G. J”reskog & Dag S”rbom

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The following lines were read from file D:\จาก desktop\ครั้งที่ 2\f4\f4.LPJ:

TI f4
f4path
!DA NI=30 NO=1000 MA=CM
SY='C:\f4\f4.dsf' NG=1

```
MO NX=30 NK=1 TD=SY
LK
f4
FR LX(1,1) LX(2,1) LX(3,1) LX(4,1) LX(5,1) LX(6,1) LX(7,1) LX(8,1)
LX(9,1)
FR LX(10,1) LX(11,1) LX(12,1) LX(13,1) LX(14,1) LX(15,1) LX(16,1)
LX(17,1) LX(18,1)
FR LX(19,1) LX(20,1) LX(21,1) LX(22,1) LX(23,1) LX(24,1) LX(25,1)
LX(26,1) LX(27,1)
FR LX(28,1) LX(29,1) LX(30,1) TD(2,1) TD(3,1) TD(3,2) TD(4,2) TD(4,3)
TD(5,1)
FR TD(5,2) TD(5,3) TD(5,4) TD(6,3) TD(6,4) TD(6,5) TD(7,1) TD(7,2)
TD(7,3)
FR TD(8,1) TD(8,3) TD(8,4) TD(8,5) TD(8,6) TD(8,7) TD(9,2) TD(9,4)
TD(10,1)
FR TD(10,3) TD(10,5) TD(10,6) TD(10,8) TD(10,9) TD(11,1) TD(11,5)
TD(11,7) TD(11,10)
FR TD(12,3) TD(12,4) TD(12,6) TD(12,7) TD(12,9) TD(12,10) TD(13,1)
TD(13,2) TD(13,4)
FR TD(13,6) TD(13,7) TD(13,8) TD(13,9) TD(13,11) TD(14,1) TD(14,2)
TD(14,4) TD(14,5)
FR TD(14,6) TD(14,7) TD(14,8) TD(14,9) TD(14,10) TD(14,12) TD(14,13)
TD(15,1) TD(15,4)
FR TD(15,5) TD(15,8) TD(15,13) TD(16,1) TD(16,6) TD(16,8) TD(16,9)
TD(16,11) TD(16,13)
FR TD(16,15) TD(17,4) TD(17,5) TD(17,7) TD(17,9) TD(17,10) TD(17,13)
TD(17,14) TD(17,16)
FR TD(18,2) TD(18,8) TD(18,12) TD(18,13) TD(18,14) TD(18,16) TD(19,3)
TD(19,4) TD(19,5)
FR TD(19,6) TD(19,7) TD(19,8) TD(19,11) TD(19,13) TD(19,14) TD(19,16)
TD(19,17) TD(19,18)
FR TD(20,1) TD(20,3) TD(20,10) TD(20,13) TD(20,15) TD(20,17)
TD(20,18) TD(20,19) TD(21,1)
FR TD(21,4) TD(21,5) TD(21,7) TD(21,8) TD(21,9) TD(21,10) TD(21,11)
TD(21,13) TD(21,16)
FR TD(21,20) TD(22,2) TD(22,3) TD(22,9) TD(22,13) TD(22,14) TD(22,15)
TD(22,16) TD(22,18)
FR TD(22,20) TD(23,1) TD(23,5) TD(23,6) TD(23,9) TD(23,10) TD(23,11)
TD(23,12) TD(23,14)
FR TD(23,16) TD(23,18) TD(23,19) TD(23,20) TD(23,22) TD(24,3)
TD(24,5) TD(24,6) TD(24,7)
FR TD(24,8) TD(24,9) TD(24,10) TD(24,12) TD(24,13) TD(24,16)
TD(24,18) TD(24,19) TD(24,20)
FR TD(24,21) TD(25,1) TD(25,4) TD(25,11) TD(25,14) TD(25,15)
TD(25,16) TD(25,20) TD(25,22)
FR TD(26,1) TD(26,3) TD(26,7) TD(26,8) TD(26,9) TD(26,10) TD(26,11)
TD(26,12) TD(26,16)
FR TD(26,17) TD(26,19) TD(26,22) TD(26,25) TD(27,2) TD(27,3) TD(27,6)
TD(27,8) TD(27,11)
FR TD(27,13) TD(27,14) TD(27,16) TD(27,19) TD(27,20) TD(27,25)
TD(28,1) TD(28,3) TD(28,4)
FR TD(28,6) TD(28,7) TD(28,9) TD(28,11) TD(28,13) TD(28,16) TD(28,17)
TD(28,18) TD(28,19)
FR TD(28,22) TD(28,23) TD(28,24) TD(29,1) TD(29,2) TD(29,5) TD(29,9)
TD(29,10) TD(29,11)
FR TD(29,12) TD(29,13) TD(29,16) TD(29,17) TD(29,25) TD(29,27)
TD(30,2) TD(30,4) TD(30,11)
```

```
FR TD(30,12) TD(30,14) TD(30,16) TD(30,18) TD(30,20) TD(30,21)
TD(30,22) TD(30,23) TD(30,24)
FR TD(30,29)
PD
OU AM AD=OFF

TI f4

Number of Input Variables 30
Number of Y - Variables    0
Number of X - Variables   30
Number of ETA - Variables  0
Number of KSI - Variables  1
Number of Observations  1000

TI f4

Covariance Matrix

    a1_92      a2_93      a3_94      a4_95      a5_96      a6_97
--------   --------   --------   --------   --------   --------

a1_92       1.00
a2_93      -0.17       1.00
a3_94       0.12      -0.21       1.00
a4_95      -0.01      -0.14       0.26       1.00
a5_96      -0.18       0.32      -0.38      -0.18       1.00
a6_97      -0.02       0.19      -0.20      -0.18       0.16
a7_98       0.11      -0.32       0.21       0.05      -0.20      -
0.17
a8_99       0.22      -0.23       0.29       0.18      -0.36      -
0.13
a9_100      0.02      -0.16       0.07       0.10      -0.09      -
0.11
a10_101     0.03      -0.23       0.33       0.10      -0.36      -
0.15
a11_102     0.03      -0.24       0.20       0.09      -0.28      -
0.26
a12_103     0.01      -0.15       0.04       0.12      -0.19      -
0.17
a13_104     0.13      -0.29       0.14       0.13      -0.27      -
0.11
a14_105    -0.03      -0.05       0.11       0.00      -0.21      -
0.25
a15_106    -0.01      -0.13       0.08       0.18      -0.20      -
0.08
a16_107    -0.02      -0.12       0.12       0.02      -0.18      -
0.01
a17_108     0.05      -0.12       0.07       0.15       0.00      -
0.10
a18_109    -0.08       0.23      -0.13      -0.07       0.25
0.15
a19_110     0.08      -0.18      -0.03      -0.10      -0.13      -
0.04
a20_111    -0.02      -0.18       0.02       0.03      -0.20      -
0.13
a21_112     0.08      -0.01       0.01      -0.08      -0.05      -
0.03
```

```
    a22_113      -0.08       0.18      -0.21      -0.07       0.30
                                                                0.18
    a23_114      -0.06      -0.09       0.04       0.05      -0.20
                                                                0.01
a24_115       0.04      -0.16       0.17       0.08      -0.05      -
                                                                0.03
a25_116      -0.05      -0.09       0.06       0.12      -0.13      -
                                                                0.10
    a26_117       0.04       0.10      -0.01      -0.01       0.13
                                                                0.07
    a27_118      -0.03       0.21      -0.18      -0.05       0.19
                                                                0.01
a28_119       0.11      -0.12       0.16       0.08      -0.08      -
                                                                0.16
a29_120      -0.07       0.04      -0.02       0.03       0.01      -
                                                                0.03
a30_121      -0.02      -0.08       0.04       0.08      -0.08      -
                                                                0.08
```

Covariance Matrix

	a7_98	a8_99	a9_100	a10_101	a11_102	a12_103
a7_98	1.00					
a8_99	0.11	1.00				
a9_100	0.11	0.10	1.00			
a10_101	0.20	0.22	-0.03	1.00		
a11_102	0.36	0.35	0.12	0.17	1.00	
a12_103	0.22	0.18	0.17	0.13	0.21	1.00
a13_104	0.33	0.08	0.14	0.26	0.39	0.17
a14_105	0.09	0.06	0.20	-0.05	0.18	0.02
a15_106	0.13	0.19	0.01	0.13	0.19	0.07
a16_107	0.12	0.05	0.14	0.17	-0.01	0.09
a17_108	-0.02	0.11	0.14	-0.10	0.10	0.09
a18_109	-0.16	-0.12	-0.06	-0.24	-0.25	-0.23
a19_110	0.06	0.12	0.05	0.25	0.03	0.16
a20_111	0.18	0.21	0.11	0.11	0.28	0.16
a21_112	0.13	0.09	0.08	0.05	-0.12	-0.01
a22_113	-0.24	-0.29	-0.14	-0.28	-0.36	-0.17
a23_114	0.04	0.11	0.14	0.36	-0.08	-0.08
a24_115	0.06	0.09	0.15	0.09	0.21	0.02
a25_116	0.11	0.13	0.00	0.13	0.25	0.03
a26_117	-0.15	-0.01	-0.24	0.11	-0.24	-0.17

```
a27_118      -0.13      -0.25      -0.07      -0.23      -0.42      -
                                                              0.12
    a28_119       0.02       0.07       0.24       0.11      -0.12
                                                              0.06
a29_120       0.00       0.06       0.10      -0.03       0.07      -
                                                              0.03
    a30_121       0.05       0.10      -0.03       0.09       0.23
                                                              0.14

                          Covariance Matrix

    a13_104    a14_105    a15_106    a16_107    a17_108    a18_109
    --------   --------   --------   --------   --------   --------
                          a13_104       1.00
                     a14_105      -0.04       1.00
                a15_106       0.04       0.12       1.00
           a16_107       0.18       0.05      -0.03       1.00
    a17_108      -0.07       0.14       0.08      -0.01       1.00
    a18_109      -0.31      -0.25      -0.14      -0.22      -0.05
                                                              1.00
a19_110       0.17       0.23       0.15       0.21       0.04      -
                                                              0.31
a20_111       0.16       0.14       0.18       0.12       0.12      -
                                                              0.32
    a21_112       0.14       0.01      -0.01       0.07       0.02
                                                              0.01
    a22_113      -0.15      -0.28      -0.19      -0.11      -0.09
                                                              0.38
a23_114       0.05       0.15       0.04       0.12       0.03      -
                                                              0.38
a24_115       0.01       0.05       0.09       0.14       0.03      -
                                                              0.20
a25_116       0.14      -0.12       0.17      -0.06       0.04      -
                                                              0.10
    a26_117      -0.09      -0.05      -0.03       0.00      -0.15
                                                              0.09
    a27_118      -0.24      -0.20      -0.12      -0.07      -0.07
                                                              0.16
a28_119      -0.15       0.02       0.04       0.15       0.15      -
                                                              0.17
a29_120      -0.10       0.02       0.05      -0.12      -0.04      -
                                                              0.01
    a30_121       0.02       0.08       0.06      -0.04       0.04
                                                              0.08

                          Covariance Matrix

    a19_110    a20_111    a21_112    a22_113    a23_114    a24_115
    --------   --------   --------   --------   --------   --------
                          a19_110       1.00
                     a20_111       0.30       1.00
                a21_112       0.00      -0.04       1.00
           a22_113      -0.26      -0.49       0.01       1.00
    a23_114       0.28       0.16      -0.03      -0.33       1.00
    a24_115      -0.07       0.04      -0.09      -0.16       0.04
                                                              1.00
    a25_116       0.09      -0.05       0.03      -0.24       0.03
                                                              0.05
```

a26_117 0.01 -0.10 -0.04 0.20 -0.06 -
0.07
a27_118 -0.10 -0.23 -0.04 0.22 -0.08 -
0.15
a28_119 0.23 0.06 -0.01 -0.21 0.18
0.21
a29_120 0.07 0.08 0.03 -0.05 0.04 -
0.03
a30_121 0.02 -0.19 0.06 -0.15 -0.02 -
0.03

Covariance Matrix

	a25_116	a26_117	a27_118	a28_119	a29_120	a30_121
a25_116	1.00					
a26_117	-0.21	1.00				
a27_118	-0.14	0.10	1.00			
a28_119	0.04	-0.06	-0.09	1.00		
a29_120	-0.06	-0.03	-0.14	-0.01	1.00	
a30_121	0.03	0.01	-0.07	0.02	-0.05	1.00

TI f4

Parameter Specifications

LAMBDA-X

	f4
a1_92	1
a2_93	2
a3_94	3
a4_95	4
a5_96	5
a6_97	6
a7_98	7
a8_99	8
a9_100	9
a10_101	10
a11_102	11
a12_103	12
a13_104	13
a14_105	14
a15_106	15
a16_107	16
a17_108	17
a18_109	18
a19_110	19
a20_111	20
a21_112	21
a22_113	22
a23_114	23
a24_115	24
a25_116	25
a26_117	26

a27_118 27
a28_119 28
a29_120 29
a30_121 30

THETA-DELTA

a1_92	a2_93	a3_94	a4_95	a5_96	a6_97
			a1_92 31		
		a2_93 32		33	
		a3_94 34	35		36
	a4_95 0		37	38	39
a5_96	40	41	42	43	44
a6_97	0	0	45	46	47
			48		
a7_98	49	50	51	0	0
			0		
a8_99	53	0	54	55	56
			57		
a9_100	0	60	0	61	0
			0		
a10_101	63	0	64	0	65
			66		
a11_102	70	0	0	0	71
			0		
a12_103	0	0	75	76	0
			77		
a13_104	82	83	0	84	0
			85		
a14_105	91	92	0	93	94
			95		
a15_106	103	0	0	104	105
			0		
a16_107	109	0	0	0	0
			110		
a17_108	0	0	0	117	118
			0		
a18_109	0	126	0	0	0
			0		
a19_110	0	0	133	134	135
			136		
a20_111	146	0	147	0	0
			0		
a21_112	155	0	0	156	157
			0		
a22_113	0	167	168	0	0
			0		
a23_114	177	0	0	0	178
			179		
a24_115	0	0	191	0	192
			193		
a25_116	206	0	0	207	0
			0		
a26_117	215	0	216	0	0
			0		
a27_118	0	229	230	0	0
			231		

```
a28_119        241          0        242        243          0
                                     244
a29_120        257        258          0          0        259
                                       0
a30_121          0        270          0        271          0
                                       0
```

THETA-DELTA

```
 a7_98      a8_99     a9_100    a10_101    a11_102    a12_103
--------   --------   --------   --------   --------   --------
                      a7_98          52
                 a8_99          58          59
            a9_100           0           0          62
       a10_101           0          67          68          69
a11_102          72          0           0          73          74
a12_103          78          0          79          80           0
                                       81
a13_104          86          87         88           0          89
                                        0
a14_105          96          97         98          99           0
                                      100
a15_106           0         106          0           0           0
                                        0
a16_107           0         111        112           0         113
                                        0
a17_108         119           0        120         121           0
                                        0
a18_109           0         127          0           0           0
                                      128
a19_110         137         138          0           0         139
                                        0
a20_111           0           0          0         148           0
                                        0
a21_112         158         159        160         161         162
                                        0
a22_113           0           0        169           0           0
                                        0
a23_114           0           0        180         181         182
                                      183
a24_115         194         195        196         197           0
                                      198
a25_116           0           0          0           0         208
                                        0
a26_117         217         218        219         220         221
                                      222
a27_118           0         232          0           0         233
                                        0
a28_119         245           0        246           0         247
                                        0
a29_120           0           0        260         261         262
                                      263
a30_121           0           0          0           0         272
                                      273
```

THETA-DELTA

```
a13_104    a14_105    a15_106    a16_107    a17_108    a18_109
```

```
--------   --------   --------   --------   --------   --------
                      a13_104          90
                a14_105          101          102
           a15_106          107            0          108
      a16_107          114            0          115          116
a17_108          122          123            0          124          125
a18_109          129          130            0          131            0
                                 132
a19_110          140          141            0          142          143
                                 144
a20_111          149            0          150            0          151
                                 152
a21_112          163            0            0          164            0
                                   0
a22_113          170          171          172          173            0
                                 174
a23_114            0          184            0          185            0
                                 186
a24_115          199            0            0          200            0
                                 201
a25_116            0          209          210          211            0
                                   0
a26_117            0            0            0          223          224
                                   0
a27_118          234          235            0          236            0
                                   0
a28_119          248            0            0          249          250
                                 251
a29_120          264            0            0          265          266
                                   0
a30_121            0          274            0          275            0
                                 276

                          THETA-DELTA

a19_110    a20_111    a21_112    a22_113    a23_114    a24_115
--------   --------   --------   --------   --------   --------
                      a19_110          145
                a20_111          153          154
           a21_112            0          165          166
      a22_113            0          175            0          176
a23_114          187          188            0          189          190
a24_115          202          203          204            0            0
                                 205
a25_116            0          212            0          213            0
                                   0
a26_117          225            0            0          226            0
                                   0
a27_118          237          238            0            0            0
                                   0
a28_119          252            0            0          253          254
                                 255
a29_120            0            0            0            0            0
                                   0
a30_121            0          277          278          279          280
                                 281

                          THETA-DELTA
```

a25_116	a26_117	a27_118	a28_119	a29_120	a30_121
		a25_116	214		
	a26_117	227	228		
	a27_118	239	0	240	
a28_119	0	0	0	256	
a29_120	267	0	268	0	269
a30_121	0	0	0	0	282
		283			

TI f4

Number of Iterations =163

LISREL Estimates (Maximum Likelihood)

LAMBDA-X

	f4
a1_92	0.11
	(0.04)
	2.96
a2_93	-0.41
	(0.03)
	-12.89
a3_94	0.31
	(0.04)
	8.15
a4_95	0.15
	(0.04)
	4.08
a5_96	-0.55
	(0.04)
	-14.77
a6_97	-0.39
	(0.04)
	-10.14
a7_98	0.41
	(0.04)
	11.43
a8_99	0.55
	(0.04)
	15.14
a9_100	0.18

```
      (0.03)
       5.17

a10_101       0.55
      (0.04)
      15.17

a11_102       0.63
      (0.03)
      18.97

a12_103       0.34
      (0.03)
      10.24

a13_104       0.50
      (0.04)
      12.39

a14_105       0.28
      (0.04)
       7.34

a15_106       0.28
      (0.03)
       8.42

a16_107       0.29
      (0.04)
       7.57

a17_108       0.19
      (0.04)
       5.12

a18_109      -0.42
      (0.03)
      -12.17

a19_110       0.46
      (0.04)
      12.01

a20_111       0.42
      (0.03)
      12.28

a21_112       0.03
      (0.04)
       0.84

a22_113      -0.54
      (0.03)
      -17.32
```

a23_114 0.16
(0.04)
4.28

a24_115 0.32
(0.04)
8.19

a25_116 0.23
(0.03)
7.09

a26_117 -0.21
(0.04)
-5.67

a27_118 -0.39
(0.04)
-11.07

a28_119 0.17
(0.04)
4.66

a29_120 0.07
(0.04)
2.06

a30_121 0.13
(0.03)
3.90

PHI

f4

1.00

THETA-DELTA

a1_92	a2_93	a3_94	a4_95	a5_96	a6_97

a1_92 0.99
(0.04)
22.35

a2_93 -0.13 0.83
(0.03) (0.04)
-4.52 21.81

a3_94 0.10 -0.08 0.90
(0.03) (0.03) (0.04)
3.38 -2.96 21.54

```
          a4_95         - -       -0.07        0.22        0.98
                      (0.03)      (0.03)      (0.04)
                      -2.65        7.81       22.39

     a5_96       -0.13        0.10       -0.21       -0.11        0.70
           (0.03)      (0.03)      (0.03)      (0.03)      (0.04)
           -4.27        4.06       -7.36       -4.00       17.45

     a6_97         - -         - -        -0.08       -0.12       -0.04
                                    0.85
                 (0.03)      (0.03)      (0.03)      (0.04)
                 -2.70       -4.00       -1.50       20.31

a7_98        0.07       -0.16        0.10         - -         - -         -
                                          -
                      (0.03)      (0.03)      (0.02)
                       2.50       -6.12        4.05

     a8_99        0.18         - -        0.13        0.11       -0.07
                                    0.08
    (0.03)                  (0.03)      (0.03)      (0.03)      (0.03)
     5.89                    4.55        3.82       -2.30        2.85

    a9_100         - -       -0.07        - -        0.08         - -
                                          - -
                      (0.03)                  (0.03)
                      -2.78                    2.81

   a10_101       -0.04         - -        0.17         - -       -0.06
                                    0.06
    (0.03)                  (0.03)                  (0.03)      (0.03)
     -1.29                   6.04                    -2.20        1.86

   a11_102       -0.03         - -         - -         - -        0.07
                                          - -
           (0.03)                                          (0.02)
           -0.96                                            3.06

a12_103         - -         - -       -0.06        0.08         - -       -
                                    0.04
                 (0.03)      (0.03)                  (0.03)
                 -2.44        3.14                    -1.33

   a13_104        0.07       -0.11         - -        0.07         - -
                                    0.09
    (0.03)      (0.03)                  (0.03)                  (0.03)
     2.31       -4.23                    2.89                    3.53

a14_105       -0.07        0.07         - -       -0.05       -0.04       -
                                    0.13
    (0.03)      (0.03)                  (0.03)      (0.03)      (0.03)
     -2.50       2.56                    -1.89       -1.66       -4.64

   a15_106       -0.04         - -         - -        0.15       -0.06
                                          - -
           (0.03)                              (0.03)      (0.03)
```

	-1.45		5.14	-2.42	
a16_107	-0.07	- -	- -	- -	- -
		0.10			
	(0.03)				(0.03)
	-2.39				3.36
a17_108	- -	- -	- -	0.11	0.11
		- -			
		(0.03)	(0.03)		
		3.84	4.39		
a18_109	- -	0.04	- -	- -	- -
		- -			
		(0.02)			
		1.72			
a19_110	- -	- -	-0.17	-0.16	0.13
		0.13			
	(0.03)	(0.03)	(0.03)	(0.03)	
	-6.30	-5.62	5.12	4.37	
a20_111	-0.07	- -	-0.09	- -	- -
		- -			
	(0.02)		(0.02)		
	-2.93		-3.77		
a21_112	0.07	- -	- -	-0.07	-0.04
		- -			
	(0.03)		(0.03)	(0.03)	
	2.49		-2.64	-1.44	
a22_113	- -	-0.06	-0.06	- -	- -
		- -			
		(0.02)	(0.02)		
		-2.88	-2.52		
a23_114	-0.11	- -	- -	- -	-0.10
		0.06			
	(0.03)			(0.02)	(0.03)
	-4.14			-4.33	2.38
a24_115	- -	- -	0.05	- -	0.14
		0.09			
	(0.03)		(0.03)	(0.03)	
	1.87		5.01	3.08	
a25_116	-0.09	- -	- -	0.09	- -
		- -			
	(0.03)			(0.03)	
	-3.03			3.28	
a26_117	0.07	- -	0.06	- -	- -
		- -			
	(0.03)		(0.03)		
	2.34		2.26		

```
a27_118        - -       0.06      -0.07        - -         - -      -
                                      0.14
          (0.02)     (0.02)                          (0.03)
           2.49      -2.77                           -5.28

a28_119       0.08        - -       0.10       0.05        - -      -
                                      0.10
     (0.03)                (0.03)     (0.03)                (0.03)
      3.00                  4.02       1.97                 -3.50

    a29_120      -0.06       0.05        - -        - -       0.04
                                        - -
          (0.03)     (0.03)                          (0.03)
          -2.13       1.98                            1.69

    a30_121        - -      -0.04        - -       0.05        - -
                                        - -
                    (0.03)                (0.03)
                    -1.68                  2.04
```

THETA-DELTA

a7_98	a8_99	a9_100	a10_101	a11_102	a12_103

```
                          a7_98       0.84
                                     (0.04)
                                     20.90

                     a8_99      -0.11       0.71
                                (0.03)     (0.04)
                                -4.31      17.89

               a9_100        - -        - -       0.97
                                       (0.04)
                                       22.49

          a10_101        - -      -0.08      -0.13       0.72
                      (0.03)     (0.03)     (0.04)
                      -2.71      -4.92      18.24

    a11_102       0.10        - -        - -      -0.19       0.61
          (0.02)                                 (0.02)     (0.03)
           4.21                                  -7.68      17.80

    a12_103       0.08        - -       0.11      -0.06        - -
                                       0.89
     (0.03)                (0.03)     (0.03)                (0.04)
      3.04                  3.87      -2.18                 21.88

    a13_104       0.15      -0.19       0.05        - -       0.09
                                        - -
          (0.03)     (0.03)     (0.03)                (0.03)
           5.23      -6.82       2.03                  2.91
```

a14_105	-0.04	-0.11	0.16	-0.22	- -	-
			0.08			
	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)	
	-1.57	-4.16	6.13	-7.58	-3.09	
a15_106	- -	0.05	- -	- -	- -	
			- -			
			(0.03)			
			1.69			
a16_107	- -	-0.11	0.10	- -	-0.20	
			- -			
	(0.03)	(0.03)		(0.03)		
	-3.82	3.46		-6.69		
a17_108	-0.12	- -	0.10	-0.22	- -	
			- -			
	(0.03)		(0.03)	(0.03)		
	-4.58		3.52	-8.00		
a18_109	- -	0.11	- -	- -	- -	-
			0.09			
	(0.02)			(0.03)		
	4.93			-3.46		
a19_110	-0.13	-0.14	- -	- -	-0.26	
			- -			
	(0.03)	(0.03)		(0.03)		
	-4.96	-4.95		-8.95		
a20_111	- -	- -	- -	-0.09	- -	
			- -			
			(0.02)			
			-4.04			
a21_112	0.11	0.07	0.07	0.06	-0.16	
			- -			
	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)	
	3.97	2.50	2.75	2.38	-6.46	
a22_113	- -	- -	-0.05	- -	- -	
			- -			
			(0.02)			
			-2.04			
a23_114	- -	- -	0.11	0.29	-0.18	-
			0.14			
	(0.03)	(0.03)	(0.02)	(0.03)		
	4.36	10.55	-8.55	-5.25		
a24_115	-0.09	-0.09	0.10	-0.10	- -	-
			0.10			
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	
	-3.27	-3.34	3.56	-3.50	-3.32	

```
    a25_116        - -        - -        - -        - -       0.10
                                                        - -
                                                     (0.02)
                                                      4.70

a26_117      -0.06       0.11      -0.19       0.24      -0.13      -
                                                     0.11
    (0.03)     (0.03)     (0.03)     (0.03)     (0.02)     (0.03)
     -2.08       4.03      -7.13       8.79      -5.70      -4.14

    a27_118        - -      -0.04        - -        - -      -0.19
                                                        - -
                (0.03)                                (0.02)
                -1.73                                 -7.95

    a28_119      -0.07        - -       0.22        - -      -0.23
                                                        - -
          (0.03)                (0.03)                (0.02)
           -2.53                 7.84                 -9.70

a29_120        - -        - -       0.08      -0.07       0.03      -
                                                     0.05
                (0.03)     (0.03)     (0.02)     (0.03)
                 2.78      -2.85       1.38      -1.96

    a30_121        - -        - -        - -        - -       0.14
                                                     0.10
                           (0.02)     (0.03)
                            6.19       3.93


                                 THETA-DELTA

    a13_104    a14_105    a15_106    a16_107    a17_108    a18_109
    --------   --------   --------   --------   --------   --------
                          a13_104       0.77
                                (0.04)
                                17.82

                     a14_105      -0.17       0.92
                           (0.03)     (0.04)
                            -6.15      21.89

                a15_106      -0.10        - -       0.92
                      (0.02)                (0.04)
                       -4.11                 22.03

           a16_107       0.04        - -      -0.10       0.91
                 (0.03)                (0.03)     (0.04)
                  1.33                 -3.72      21.28

    a17_108      -0.16       0.10        - -      -0.05       0.97
          (0.03)     (0.03)                (0.03)     (0.04)
           -5.72       3.48                 -1.71      22.12
```

```
    a18_109     -0.10      -0.15        - -      -0.10        - -
                                 0.82
    (0.03)     (0.03)                (0.03)                (0.04)
     -4.04      -5.80                 -3.80                 21.28

a19_110      -0.04       0.11        - -        0.09      -0.05      -
                                 0.11
    (0.03)     (0.03)                (0.03)     (0.03)     (0.03)
     -1.40       3.53                  3.30      -1.55      -3.79

a20_111      -0.04        - -       0.07        - -        0.04      -
                                 0.13
    (0.03)                (0.03)                (0.02)     (0.03)
     -1.68                  2.67                  1.91      -5.06

    a21_112      0.12        - -        - -       0.07        - -
                                 - -
               (0.03)                           (0.03)
                4.58                             2.34

    a22_113      0.12      -0.12      -0.03       0.04        - -
                                 0.16
    (0.02)     (0.02)     (0.02)     (0.02)                (0.03)
      4.84      -5.16      -1.42       1.75                  6.19

a23_114        - -       0.11        - -        0.09       - -       -
                                 0.31
          (0.03)                (0.03)                (0.03)
           3.63                  3.24                 -11.50

a24_115      -0.17        - -        - -        0.03       - -       -
                                 0.07
    (0.03)                           (0.03)                (0.03)
     -5.87                             1.04                 -2.72

    a25_116        - -     -0.18       0.12      -0.12        - -
                                 - -
                     (0.03)     (0.03)     (0.03)
                      -6.97       4.19      -4.09

    a26_117        - -        - -        - -       0.06      -0.12
                                 - -
                          (0.03)     (0.03)
                            2.19      -4.05

    a27_118     -0.06      -0.10        - -       0.05        - -
                                 - -
               (0.03)     (0.02)                (0.03)
                -2.23      -3.86                  1.73

a28_119      -0.25        - -        - -        0.10      0.11       -
                                 0.10
    (0.03)                           (0.03)     (0.03)     (0.03)
     -8.65                             3.16       4.18      -3.83
```

```
a29_120      -0.14        - -        - -      -0.14      -0.06
                                        - -
      (0.03)                             (0.03)     (0.03)
       -4.89                              -4.59      -2.07

a30_121        - -       0.05        - -      -0.06        - -
                                0.12
      (0.02)                (0.03)                (0.03)
       1.93                  -2.03                 4.30
```

THETA-DELTA

```
a19_110    a20_111    a21_112    a22_113    a23_114    a24_115
--------   --------   --------   --------   --------   --------
                      a19_110       0.78
                            (0.04)
                             18.93

                  a20_111       0.08       0.83
                        (0.02)     (0.04)
                         3.06      21.40

            a21_112        - -      -0.04       1.00
                        (0.02)     (0.04)
                        -1.67      22.39

      a22_113        - -      -0.26        - -      0.71
                  (0.03)                   (0.03)
                   -9.86                    21.25

a23_114       0.21       0.10        - -      -0.24       0.98
      (0.03)     (0.03)                (0.03)     (0.04)
       7.60       3.53                 -9.28      23.20

a24_115      -0.20      -0.11      -0.09        - -        - -
                                0.89
 (0.03)     (0.03)     (0.03)                              (0.04)
  -6.55      -4.21      -3.08                              20.86

a25_116        - -      -0.14        - -      -0.12        - -
                                        - -
                  (0.03)                   (0.03)
                   -5.35                    -4.75

a26_117       0.10        - -        - -       0.07        - -
                                        - -
            (0.03)                             (0.02)
             4.02                               3.30

a27_118       0.09      -0.07        - -        - -        - -
                                        - -
                        (0.03)     (0.02)
                         3.19      -3.11
```

a28_119	0.15	- -	- -	-0.14	0.15
			0.15		
	(0.03)		(0.02)	(0.03)	(0.03)
	5.61		-6.31	5.69	5.16
a29_120	- -	- -	- -	- -	- -
			- -		
a30_121	- -	-0.25	0.06	-0.08	-0.04
			0.08		
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
	-8.98	2.04	-2.93	-1.51	-2.73

THETA-DELTA

a25_116	a26_117	a27_118	a28_119	a29_120	a30_121
0.95					
(0.04)					
22.47					
-0.17	0.96				
(0.03)	(0.04)				
-6.02	22.17				
-0.05	- -	0.85			
(0.03)		(0.04)			
-1.78		21.11			
- -	- -	- -	0.97		
			(0.04)		
			22.56		
-0.07	- -	-0.11	- -	0.99	
(0.03)		(0.03)		(0.04)	
-2.59		-3.90		22.34	
- -	- -	- -	- -	-0.06	
			0.98		
		(0.03)	(0.04)		
		-2.22	22.50		

Squared Multiple Correlations for X - Variables

a1_92	a2_93	a3_94	a4_95	a5_96	a6_97
0.01	0.17	0.09	0.02	0.30	0.15

Squared Multiple Correlations for X - Variables

a7_98	a8_99	a9_100	a10_101	a11_102	a12_103
0.16	0.30	0.03	0.29	0.40	0.12

Squared Multiple Correlations for X - Variables

a13_104	a14_105	a15_106	a16_107	a17_108	a18_109
0.24	0.08	0.08	0.08	0.03	0.18

Squared Multiple Correlations for X - Variables

a19_110	a20_111	a21_112	a22_113	a23_114	a24_115
0.21	0.17	0.00	0.29	0.02	0.10

Squared Multiple Correlations for X - Variables

a25_116	a26_117	a27_118	a28_119	a29_120	a30_121
0.05	0.04	0.15	0.03	0.01	0.02

Goodness of Fit Statistics

Degrees of Freedom = 182
Minimum Fit Function Chi-Square = 108.22 (P = 1.00)
Normal Theory Weighted Least Squares Chi-Square = 106.58 (P = 1.00)
Estimated Non-centrality Parameter (NCP) = 0.0
90 Percent Confidence Interval for NCP = (0.0 ; 0.0)

Minimum Fit Function Value = 0.11
Population Discrepancy Function Value (F0) = 0.0
90 Percent Confidence Interval for F0 = (0.0 ; 0.0)
Root Mean Square Error of Approximation (RMSEA) = 0.0
90 Percent Confidence Interval for RMSEA = (0.0 ; 0.0)
P-Value for Test of Close Fit (RMSEA < 0.05) = 1.00

Expected Cross-Validation Index (ECVI) = 0.75
90 Percent Confidence Interval for ECVI = (0.75 ; 0.75)
ECVI for Saturated Model = 0.93
ECVI for Independence Model = 10.07

Chi-Square for Independence Model with 435 Degrees of Freedom = 9995.30
Independence AIC = 10055.30
Model AIC = 672.58
Saturated AIC = 930.00
Independence CAIC = 10232.53
Model CAIC = 2344.48
Saturated CAIC = 3677.11

Normed Fit Index (NFI) = 0.99
Non-Normed Fit Index (NNFI) = 1.02
Parsimony Normed Fit Index (PNFI) = 0.41
Comparative Fit Index (CFI) = 1.00
Incremental Fit Index (IFI) = 1.01
Relative Fit Index (RFI) = 0.97

Critical N (CN) = 2117.68

Root Mean Square Residual (RMR) = 0.016
Standardized RMR = 0.016
Goodness of Fit Index (GFI) = 0.99
Adjusted Goodness of Fit Index (AGFI) = 0.98
Parsimony Goodness of Fit Index (PGFI) = 0.39

TI f4

Modification Indices and Expected Change

No Non-Zero Modification Indices for LAMBDA-X

No Non-Zero Modification Indices for PHI

Modification Indices for THETA-DELTA

	a1_92	a2_93	a3_94	a4_95	a5_96	a6_97
a1_92	- -					
a2_93	- -	- -				
a3_94	- -	- -	- -			
a4_95	0.36	- -	- -	- -		
a5_96	- -	- -	- -	- -	- -	
a6_97	0.77	0.41	- -	- -	- -	- -
a7_98	- -	- -	- -	0.20	1.27	0.15
a8_99	- -	0.00	- -	- -	- -	- -
a9_100	0.02	- -	0.01	- -	0.22	1.42
a10_101	- -	0.00	- -	0.43	- -	- -
a11_102	- -	0.87	0.38	0.03	- -	0.12
a12_103	1.39	0.22	- -	- -	0.28	- -
a13_104	- -	- -	0.48	- -	0.71	- -
a14_105	- -	- -	0.91	- -	- -	- -
a15_106	- -	0.48	0.00	- -	- -	1.52
a16_107	- -	0.23	0.94	1.32	0.79	- -
a17_108	0.68	0.98	0.05	- -	- -	0.97
a18_109	0.67	- -	0.06	0.02	0.15	0.01
a19_110	0.87	1.17	- -	- -	- -	- -
a20_111	- -	0.01	- -	0.43	1.89	0.14
a21_112	- -	0.03	0.06	- -	- -	0.63
a22_113	0.24	- -	- -	0.00	0.68	0.71

a23_114	- -	0.89	0.44	0.47	- -
		- -			
a24_115	0.24	0.17	- -	1.14	- -
		- -			
a25_116	- -	0.10	0.62	- -	0.00
		0.54			
a26_117	- -	0.09	- -	0.21	0.26
		0.33			
a27_118	0.07	- -	- -	0.03	1.03
		- -			
a28_119	- -	1.30	- -	- -	0.28
		- -			
a29_120	- -	- -	1.13	0.76	- -
		0.01			
a30_121	0.89	- -	1.00	- -	0.00
		0.42			

Modification Indices for THETA-DELTA

a7_98	a8_99	a9_100	a10_101	a11_102	a12_103
		a7_98	- -		
	a8_99	- -	- -		
a9_100	1.48	0.17	- -		
a10_101	0.03	- -	- -	- -	
a11_102	- -	0.09	0.11	- -	- -
a12_103	- -	0.05	- -	- -	0.00
		- -			
a13_104	- -	- -	- -	0.08	- -
		0.11			
a14_105	- -	- -	- -	- -	0.02
		- -			
a15_106	0.56	- -	1.69	0.58	0.00
		0.65			
a16_107	0.02	- -	- -	0.06	- -
		0.26			
a17_108	- -	0.03	- -	- -	0.70
		0.91			
a18_109	0.11	- -	0.10	0.41	0.50
		- -			
a19_110	- -	- -	0.48	0.03	- -
		0.17			
a20_111	0.09	0.00	0.18	- -	0.24
		0.31			
a21_112	- -	- -	- -	- -	- -
		0.47			
a22_113	0.53	0.13	- -	1.27	0.24
		0.36			
a23_114	0.51	0.79	- -	- -	- -
		- -			
a24_115	- -	- -	- -	- -	0.21
		- -			
a25_116	0.09	0.50	0.76	0.04	- -
		1.97			
a26_117	- -	- -	- -	- -	- -
		- -			
a27_118	0.83	- -	0.16	0.91	- -
		0.07			

a28_119	- -	1.31	- -	0.18	- -
		0.02			
a29_120	1.60	0.41	- -	- -	- -
		- -			
a30_121	0.12	1.27	1.36	0.47	- -
		- -			

Modification Indices for THETA-DELTA

a13_104	a14_105	a15_106	a16_107	a17_108	a18_109
		a13_104	- -		
	a14_105	- -	- -		
	a15_106	- -	1.30	- -	
a16_107	- -	1.02	- -	- -	
a17_108	- -	- -	1.31	- -	- -
a18_109	- -	- -	0.57	- -	0.85
		- -			
a19_110	- -	- -	0.30	- -	- -
		- -			
a20_111	- -	0.49	- -	0.12	- -
		- -			
a21_112	- -	0.01	0.54	- -	0.04
		0.10			
a22_113	- -	- -	- -	- -	0.09
		- -			
a23_114	0.93	- -	0.35	- -	0.05
		- -			
a24_115	- -	1.46	0.00	- -	0.99
		- -			
a25_116	1.43	- -	- -	- -	0.08
		0.26			
a26_117	0.85	0.12	0.93	- -	- -
		0.02			
a27_118	- -	- -	0.03	- -	0.04
		0.00			
a28_119	- -	0.54	0.01	- -	- -
		- -			
a29_120	- -	0.00	0.88	- -	- -
		0.79			
a30_121	1.20	- -	0.19	- -	0.14
		- -			

Modification Indices for THETA-DELTA

a19_110	a20_111	a21_112	a22_113	a23_114	a24_115
		a19_110	- -		
	a20_111	- -	- -		
	a21_112	0.05	- -	- -	
a22_113	0.69	- -	0.70	- -	
a23_114	- -	- -	0.47	- -	- -
a24_115	- -	- -	- -	0.01	0.11
		- -			
a25_116	0.72	- -	0.15	- -	0.33
		1.33			
a26_117	- -	0.01	1.29	- -	0.96
		0.11			

a27_118	- -	- -	1.21	0.04	0.13
		0.91			
a28_119	- -	0.10	0.13	- -	- -
		- -			
a29_120	0.45	1.45	0.79	0.01	0.65
		1.78			
a30_121	1.94	- -	- -	- -	- -
		- -			

Modification Indices for THETA-DELTA

a25_116	a26_117	a27_118	a28_119	a29_120	a30_121
		a25_116	- -		
	a26_117	- -	- -		
	a27_118	- -	0.97	- -	
a28_119	0.32	0.27	0.85	- -	
a29_120	- -	0.15	- -	0.53	- -
a30_121	0.00	0.74	0.53	0.04	- -
		- -			

Expected Change for THETA-DELTA

a1_92	a2_93	a3_94	a4_95	a5_96	a6_97
		a1_92	- -		
	a2_93	- -	- -		
	a3_94	- -	- -	- -	
a4_95	-0.02	- -	- -	- -	- -
a5_96	- -	- -	- -	- -	- -
a6_97	0.03	0.02	- -	- -	- -	-
			-			
a7_98	- -	- -	- -	-0.01	0.03	-
			0.01			
a8_99	- -	0.00	- -	- -	- -	-
			-			
a9_100	0.00	- -	0.00	- -	0.01	-
			0.03			
a10_101	- -	0.00	- -	0.02	- -	
			- -			
a11_102	- -	0.02	0.02	0.00	- -	-
			0.01			
a12_103	-0.03	-0.01	- -	- -	-0.01	
			- -			
a13_104	- -	- -	-0.02	- -	-0.02	
			- -			
a14_105	- -	- -	0.03	- -	- -	
			- -			
a15_106	- -	-0.02	0.00	- -	- -	
			0.03			
a16_107	- -	0.01	0.03	-0.03	-0.02	
			- -			
a17_108	0.02	-0.03	0.01	- -	- -	-
			0.03			
a18_109	-0.02	- -	0.01	0.00	0.01	
			0.00			
a19_110	0.03	0.03	- -	- -	- -	
			- -			

```
    a20_111        - -       0.00        - -      -0.02       0.03
                                0.01
a21_112        - -       0.01       0.01        - -        - -      -
                                0.02
a22_113      -0.01        - -        - -       0.00       0.02      -
                                0.02
    a23_114        - -      -0.02      -0.02       0.02        - -
                                - -
    a24_115      -0.01      -0.01        - -       0.03        - -
                                - -
a25_116        - -       0.01      -0.02        - -       0.00      -
                                0.02
a26_117        - -       0.01        - -       0.01       0.01      -
                                0.02
    a27_118       0.01        - -        - -       0.00      -0.03
                                - -
    a28_119        - -      -0.03        - -        - -       0.01
                                - -
    a29_120        - -        - -      -0.03       0.02        - -
                                0.00
a30_121      -0.03        - -      -0.03        - -       0.00      -
                                0.02
```

Expected Change for THETA-DELTA

a7_98	a8_99	a9_100	a10_101	a11_102	a12_103
a7_98	- -				
a8_99	- -	- -			
a9_100	0.03	0.01	- -		
a10_101	0.00	- -	- -	- -	
a11_102	- -	-0.01	0.01	- -	- -
a12_103	- -	0.01	- -	- -	0.00
a13_104	- -	- -	- -	-0.01	- -
a14_105	- -	- -	- -	- -	0.00
a15_106	0.02	- -	-0.03	-0.02	0.00
a16_107	0.00	- -	- -	-0.01	- -
a17_108	- -	0.00	- -	- -	-0.02
a18_109	0.01	- -	0.01	-0.02	0.02
a19_110	- -	- -	-0.02	0.01	- -
a20_111	0.01	0.00	0.01	- -	0.01
a21_112	- -	- -	- -	- -	- -
a22_113	-0.02	0.01	- -	0.03	-0.01
a23_114	-0.02	0.03	- -	- -	- -
a24_115	- -	- -	- -	- -	0.01

```
a25_116        0.01        0.02       -0.02        0.00         - -        -
                                0.04
   a26_117        - -         - -         - -         - -         - -
                                 - -
   a27_118       0.03         - -        0.01       -0.03         - -
                                0.01
   a28_119        - -       -0.03         - -        0.01         - -
                                0.00
   a29_120      -0.04        0.02         - -         - -         - -
                                 - -
   a30_121       0.01        0.03       -0.03        0.02         - -
                                 - -
```

Expected Change for THETA-DELTA

```
   a13_104    a14_105    a15_106    a16_107    a17_108    a18_109
   --------   --------   --------   --------   --------   --------
                          a13_104        - -
                     a14_105       - -        - -
                a15_106        - -        0.03        - -
           a16_107       - -      -0.03        - -        - -
   a17_108        - -         - -        0.03         - -         - -
   a18_109        - -         - -       -0.02         - -        0.02
                                 - -
   a19_110        - -         - -        0.01         - -         - -
                                 - -
   a20_111        - -        0.02         - -        0.01         - -
                                 - -
   a21_112        - -        0.00       -0.02         - -        0.01
                                0.01
   a22_113        - -         - -         - -         - -        0.01
                                 - -
   a23_114      -0.03         - -       -0.01         - -        0.01
                                 - -
   a24_115        - -       -0.03        0.00         - -       -0.03
                                 - -
a25_116        0.03         - -         - -         - -        0.01       -
                                0.01
   a26_117       0.02        0.01        0.03         - -         - -
                                0.00
   a27_118        - -         - -        0.00         - -        0.01
                                0.00
   a28_119        - -       -0.02        0.00         - -         - -
                                 - -
   a29_120        - -        0.00        0.03         - -         - -
                                0.02
   a30_121      -0.03         - -        0.01         - -        0.01
                                 - -
```

Expected Change for THETA-DELTA

```
   a19_110    a20_111    a21_112    a22_113    a23_114    a24_115
   --------   --------   --------   --------   --------   --------
                          a19_110        - -
                     a20_111       - -        - -
                a21_112        0.01        - -        - -
           a22_113      -0.02        - -        0.02        - -
   a23_114        - -         - -       -0.02         - -         - -
```

```
   a24_115        - -        - -        - -       0.00      -0.01
                                        - -
a25_116      -0.02        - -       0.01        - -      -0.01      -
                                       0.03
a26_117        - -       0.00      -0.03        - -      -0.03      -
                                       0.01
a27_118        - -        - -      -0.03       0.00      -0.01      -
                                       0.03
   a28_119        - -      -0.01      -0.01        - -        - -
                                        - -
a29_120       0.02       0.03       0.03       0.00       0.02      -
                                       0.04
   a30_121      -0.04        - -        - -        - -        - -
                                        - -
```

Expected Change for THETA-DELTA

	a25_116	a26_117	a27_118	a28_119	a29_120	a30_121
a25_116				- -		
a26_117				- -	- -	
a27_118				- -	0.03	- -
a28_119	0.01	-0.01	-0.02			- -
a29_120	- -	-0.01	- -	-0.02		- -
a30_121	0.00	0.02	-0.02	0.01	- -	

Maximum Modification Index is 1.97 for Element (25,12) of THETA-DELTA

Time used: 0.688 Seconds

(สำเนา)

ที่ ศธ 0521.2.0706/ ภาควิชาประเมินผลและวิจัยทางการศึกษา
คณะศึกษาศาสตร์ มหาวิทยาลัยสงขลานครินทร์
วิทยาเขตปัตตานี ตำบลรูสะมิแล อำเภอเมือง
จังหวัดปัตตานี 94000

ตุลาคม 2551

เรื่อง ขอความอนุเคราะห์ให้นักศึกษาปริญญาโทเก็บข้อมูลเพื่อการวิจัย

เรียน

ด้วยว่าที่ร้อยตรีชาครีย์ คะนอง นักศึกษาปริญญาโท สาขาวิชาการวัดผลและวิจัยการศึกษา คณะศึกษาศาสตร์ มหาวิทยาลัยสงขลานครินทร์ วิทยาเขตปัตตานี กำลังทำวิทยานิพนธ์ เรื่อง “การวิเคราะห์คุณภาพแบบทดสอบวัดศักยภาพการเรียน ระดับอุดมศึกษาของมหาวิทยาลัยสงขลานครินทร์” โดยมี รองศาสตราจารย์ ดร.วิรัตน์ ธรรมาภรณ์ เป็นอาจารย์ที่ปรึกษา เพื่อให้การทำวิทยานิพนธ์ในครั้งนี้ สามารถดำเนินไปตามแบบแผน

จึงเรียนมาเพื่อโปรดพิจารณาให้ความอนุเคราะห์ จักเป็นพระคุณยิ่ง

ขอแสดงความนับถือ

(รองศาสตราจารย์ ดร.วิรัตน์ ธรรมาภรณ์)
หัวหน้าภาควิชาประเมินผลและวิจัยทางการศึกษา

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โทรสาร 0 7334 8322