

มหาวิทยาลัยบูรพา
Burapha University

ภาคผนวก

มหาวิทยาลัยบูรพา
Burapha University

ภาคผนวก ก

หนังสือขอข้อมูลระดับชาตินักเรียนชั้นประถมศึกษาปีที่ 3 (NT)

(สำเนา)

ที่ ศธ. ๖๖๒๑/ ๔๕๕

คณะศึกษาศาสตร์ มหาวิทยาลัยบูรพา

ต.แสนสุข อ.เมือง จ.ชลบุรี ๒๐๑๓๑

๒๑ กุมภาพันธ์ ๒๕๕๕

เรื่อง ขอข้อมูลดิบ คือ เพศผู้สอบ สถานที่ตั้งทางภูมิศาสตร์ของโรงเรียน และคำตอบของนักเรียน
รายบุคคลที่ผ่านการตรวจให้คะแนนแบบ ๑ - ๐

เรียน ผู้อำนวยการสำนักทดสอบทางการศึกษา สำนักงานคณะกรรมการการศึกษาขั้นพื้นฐาน

สิ่งที่ส่งมาด้วย โครงร่างงานวิจัย จำนวน ๑ ฉบับ

ด้วยนางสาวสุพัฒนา หอมบุบผา นิสิตปริญญาเอก หลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชา
วิจัย วัดผลและสถิติการศึกษา คณะศึกษาศาสตร์ มหาวิทยาลัยบูรพา ได้รับอนุมัติให้ทำดุษฎีนิพนธ์
เรื่อง การเปรียบเทียบการทำหน้าที่ต่างกันของข้อสอบ ด้วยวิธี HGLM วิธี MIMIC MODEL และ
วิธี BAYESIAN โดยมี รศ.ดร.ไพรัตน์ วงษ์นาม เป็นอาจารย์ที่ปรึกษาหลัก อาจารย์ ดร.สมพงษ์ ปั่นหุ่น
และอาจารย์ ดร.สุริพร อนุศาสนนันท์ เป็นอาจารย์ที่ปรึกษาร่วม ในการทำวิจัยครั้งนี้จำเป็นต้องใช้ข้อมูล
ผลการประเมินคุณภาพการศึกษาระดับชาติ ชั้นประถมศึกษาปีที่ ๓ ปีการศึกษา ๒๕๕๓ เพื่อนำข้อมูล
มาวิเคราะห์หาข้อสรุปตามวัตถุประสงค์ของการวิจัยจากความจำเป็นต้องใช้ข้อมูลดังกล่าว
จึงขอความอนุเคราะห์ข้อมูลข้างต้นจากสำนักทดสอบทางการศึกษา สำนักงานคณะกรรมการการศึกษา
ขั้นพื้นฐาน กระทรวงศึกษาธิการ โดยจะขอเฉพาะข้อมูลดิบ ๓ ตัว ได้แก่ เพศผู้สอบ สถานที่ตั้ง
ทางภูมิศาสตร์ของโรงเรียน และคำตอบของนักเรียนรายบุคคลที่ผ่านการตรวจให้คะแนนแบบ ๑ - ๐
เท่านั้น ไม่ขอใช้ตัวข้อสอบฉบับจริง ผลการวิจัยจะเป็นประโยชน์ในเชิงวิชาการในการประยุกต์วิธีการ
วิเคราะห์การทำหน้าที่ต่างกันของข้อสอบ (DIF) ตามทฤษฎีการตอบสนองข้อสอบ และจะเป็นแนวทาง
ในการนำไปใช้วิเคราะห์ข้อสอบระดับชาติอื่น ๆ ต่อไป เมื่อผู้วิจัยทำการวิจัยและสร้างข้อสรุปในภาพรวม
เรียบร้อยแล้วจะทำการลบข้อมูลดังกล่าวทิ้งทันที ส่วนระหว่างกระบวนการวิเคราะห์ข้อมูลจะเก็บรักษาข้อมูล
ดังกล่าวไว้เป็นความลับและเข้าถึงข้อมูลได้เฉพาะข้าพเจ้าและผู้ร่วมวิเคราะห์ข้อมูลเท่านั้น

จึงเรียนมาเพื่อโปรดพิจารณา คณะศึกษาศาสตร์ มหาวิทยาลัยบูรพา หวังเป็นอย่างยิ่ง
ว่าคงจะได้รับความอนุเคราะห์จากท่านด้วยดี และขอขอบคุณอย่างสูงมา ณ โอกาสนี้

ขอแสดงความนับถือ

วิมลรัตน์ จตุรานนท์

(ผู้ช่วยศาสตราจารย์ ดร.วิมลรัตน์ จตุรานนท์)

รองคณบดีฝ่ายวิชาการ ปฏิบัติการแทนคณบดีคณะศึกษาศาสตร์

ภาคผนวก ข

ตัวอย่างผลการประมาณค่าพารามิเตอร์ผู้ตอบจากโปรแกรม HLM ด้วยวิธี HGLM – 2L
โปรแกรม Mplus ด้วยวิธี MIMIC และโปรแกรม WinBUGS ด้วยวิธี BAYESIAN

ตารางที่ ข – 1 ผลการประมาณค่าพารามิเตอร์ผู้สอบ วิชาภาษาไทย จากโปรแกรม HLM ด้วยวิธี
HGLM – 2L โปรแกรม Mplus ด้วยวิธี MIMIC และโปรแกรม Winbugs
ด้วยวิธี BAYESIAN

ผู้สอบคนที่	ผลการประมาณค่าพารามิเตอร์ผู้สอบ วิชาภาษาไทย		
	ค่า θ ของ HGLM - 2L	ค่า θ ของ MIMIC	ค่า θ ของ BAYESIAN
1	1.000	1.336	1.255
2	-.371	-.298	-.438
3	-.371	-.318	-.442
4	.841	1.199	1.052
5	-.747	-.739	-.910
6	.545	.804	.690
7	.406	.653	.516
8	.690	.972	.864
9	-.245	-.156	-.287
10	1.168	1.564	1.466
11	.690	.921	.869
12	.270	.469	.348
13	1.000	1.337	1.263
14	.690	.953	.866
15	.406	.595	.519
16	.138	.293	.182
17	.841	1.159	1.058
18	.690	.942	.866
19	-.119	.005	-.130
20	-.621	-.599	-.751
21	-.621	-.633	-.749
22	.406	.606	.518
23	.690	.944	.871

ตารางที่ ข - 1 (ต่อ)

ผู้สอบคนที่	ผลการประมาณค่าพารามิเตอร์ผู้สอบ วิชาภาษาไทย		
	ค่า θ ของ HGLM - 2L	ค่า θ ของ MIMIC	ค่า θ ของ BAYESIAN
24	.406	.613	.516
25	1.000	1.381	1.260
26	.690	1.011	.868
27	1.540	2.004	1.943
28	.690	.969	.866
29	-.621	-.616	-.753
30	.008	.132	.023
.	.	.	.
.	.	.	.
971	1.000	1.336	1.255
972	-.371	-.298	-.438
973	-.371	-.318	-.442
974	.841	1.199	1.052
975	-.747	-.739	-.910
976	.545	.804	.690
977	.406	.653	.516
978	.690	.972	.864
979	-.245	-.156	-.287
980	1.168	1.564	1.466
981	.690	.921	.869
982	.270	.469	.348
983	1.000	1.337	1.263
984	.690	.953	.866
985	.406	.595	.519
986	.138	.293	.182

ตารางที่ ข - 1 (ต่อ)

ผู้สอบคนที่	ผลการประมาณค่าพารามิเตอร์ผู้สอบ วิชาภาษาไทย		
	ค่า θ ของ HGLM - 2L	ค่า θ ของ MIMIC	ค่า θ ของ BAYESIAN
987	.841	1.159	1.058
988	.690	.942	.866
989	-.119	.005	-.130
990	-.621	-.599	-.751
991	-.621	-.633	-.749
992	.406	.606	.518
993	.690	.944	.871
994	.406	.613	.516
995	1.000	1.381	1.260
996	.690	1.011	.868
997	1.540	2.004	1.943
998	.690	.969	.866
999	-.621	-.616	-.753
1000	.008	.132	.023

ตารางที่ ข - 2 ผลการประมาณค่าพารามิเตอร์ผู้สอบ วิชาคณิตศาสตร์ จากโปรแกรม HLM ด้วยวิธี
HGLM-2L โปรแกรม Mplus ด้วยวิธี MIMIC และโปรแกรม Winbugs
ด้วยวิธี BAYESIAN

ผู้สอบคนที่	ผลการประมาณค่าพารามิเตอร์ผู้สอบ วิชาคณิตศาสตร์		
	ค่า θ ของ HGLM - 2L	ค่า θ ของ MIMIC	ค่า θ ของ BAYESIAN
1	.768	.537	.680
2	.597	.374	.520
3	.281	.063	.217
4	1.374	1.075	1.265
5	-1.375	-1.520	-1.340

ตารางที่ ข - 2 (ต่อ)

ผู้สอบคนที่	ผลการประมาณค่าพารามิเตอร์ผู้สอบ วิชาคณิตศาสตร์		
	ค่า θ ของ HGLM - 2L	ค่า θ ของ MIMIC	ค่า θ ของ BAYESIAN
6	1.374	1.080	1.268
7	.768	.518	.683
8	1.911	1.477	1.801
9	-.149	-.362	-.189
10	1.911	1.503	1.802
11	1.624	1.292	1.514
12	.768	.526	.682
13	1.624	1.331	1.515
14	1.624	1.338	1.518
15	1.374	1.085	1.267
16	1.153	.921	1.053
17	1.153	.844	1.056
18	.953	.724	.860
19	-.285	-.480	-.317
20	-.285	-.466	-.318
21	.597	.335	.520
22	.768	.473	.688
23	.597	.328	.519
24	1.800	1.679	1.804
25	1.504	1.380	1.521
26	1.504	1.396	1.518
27	1.504	1.404	1.518
28	.441	.376	.516
29	-1.035	-.944	-.819
30	-.190	-.205	-.060

ตารางที่ ข – 2 (ต่อ)

ผู้สอบคนที่	ผลการประมาณค่าพารามิเตอร์ผู้สอบ วิชาคณิตศาสตร์		
	ค่า θ ของ HGLM - 2L	ค่า θ ของ MIMIC	ค่า θ ของ BAYESIAN
971	.597	.345	.515
972	.953	.648	.864
973	-.010	-.207	-.055
974	-1.091	-1.238	-1.074
975	1.153	.895	1.057
976	-.553	-.751	-.567
977	-1.680	-1.797	-1.630
978	1.153	.849	1.053
979	-1.091	-1.280	-1.077
980	-1.525	-1.657	-1.484
981	1.624	1.267	1.520
982	-.686	-.856	-.692
983	.435	.213	.363
984	.435	.190	.361
985	.133	-.086	.075
986	-1.375	-1.517	-1.339
987	-.553	-.732	-.565
988	-.819	-.997	-.824
989	.281	.052	.218
990	-.419	-.617	-.443
991	-.954	-1.122	-.944
992	.953	.689	.863
993	-.553	-.724	-.570
994	-.285	-.484	-.319
995	.441	.405	.518

ตารางที่ ข – 2 (ต่อ)

ผู้สอบคนที่	ผลการประมาณค่าพารามิเตอร์ผู้สอบ วิชาคณิตศาสตร์		
	ค่า θ ของ HGLM - 2L	ค่า θ ของ MIMIC	ค่า θ ของ BAYESIAN
996	-.954	-1.087	-.945
997	-1.765	-1.612	-1.484
998	-.686	-.856	-.696
999	-1.680	-1.727	-1.630
1000	-.618	-.596	-.443

ตารางที่ ข – 3 ผลการประมาณค่าพารามิเตอร์ผู้สอบ วิชาวิทยาศาสตร์ จากโปรแกรม HLM
 ด้วยวิธี HGLM – 2L โปรแกรม Mplus ด้วยวิธี MIMIC และโปรแกรม Winbugs
 ด้วยวิธี BAYESIAN

ผู้สอบคนที่	ผลการประมาณค่าพารามิเตอร์ผู้สอบ วิชาวิทยาศาสตร์		
	ค่า θ ของ HGLM - 2L	ค่า θ ของ MIMIC	ค่า θ ของ BAYESIAN
1	2.207	1.672	1.967
2	1.908	1.356	1.670
3	1.023	.555	.828
4	1.023	.579	.834
5	-.973	-1.246	-.999
6	.683	.229	.512
7	1.213	.737	1.004
8	1.649	1.157	1.424
9	-.040	-.414	-.151
10	1.420	.934	1.196
11	1.908	1.401	1.670
12	1.023	.561	.832
13	1.023	.513	.83

ตารางที่ ข - 3 (ต่อ)

ผู้สอบคนที่	ผลการประมาณค่าพารามิเตอร์ผู้สอบ วิชาวิทยาศาสตร์		
	ค่า θ ของ HGLM - 2L	ค่า θ ของ MIMIC	ค่า θ ของ BAYESIAN
14	1.213	.694	1.005
15	1.649	1.029	1.422
16	.848	.408	.661
17	1.213	.702	1.002
18	1.649	1.030	1.421
19	.683	.245	.515
20	.848	.408	.666
21	.683	.244	.514
22	1.023	.581	.829
23	.848	.375	.661
24	.944	.735	1.002
25	1.706	1.385	1.670
26	.736	.631	.827
27	1.171	.991	1.201
28	1.423	1.186	1.416
29	-1.569	-1.390	-1.128
30	-.568	-.509	-.268
.	.	.	.
.	.	.	.
971	.683	.202	.514
972	.848	.321	.669
973	-1.114	-1.320	-1.127
974	-1.260	-1.409	-1.260
975	-1.114	-1.403	-1.126
976	-1.260	-1.499	-1.260

ตารางที่ ข - 3 (ต่อ)

ผู้สอบคนที่	ผลการประมาณค่าพารามิเตอร์ผู้สอบ วิชาวิทยาศาสตร์		
	ค่า θ ของ HGLM - 2L	ค่า θ ของ MIMIC	ค่า θ ของ BAYESIAN
977	-.701	-1.031	-.749
978	1.213	.744	1.006
979	-1.114	-1.365	-1.128
980	-1.746	-2.011	-1.698
981	1.213	.739	1.012
982	-.569	-.822	-.629
983	.095	-.326	-.028
984	.527	.079	.366
985	1.023	.514	.828
986	-.040	-.447	-.154
987	-.174	-.552	-.273
988	.378	-.050	.230
989	.683	.242	.515
990	.235	-.172	.100
991	-1.574	-1.830	-1.542
992	.683	.244	.509
993	-.306	-.670	-.392
994	.235	-.201	.098
995	.193	.134	.363
996	-1.412	-1.613	-1.392
997	-1.421	-1.195	-.998
998	-1.114	-1.360	-1.128
999	-1.932	-2.135	-1.875
1000	-2.045	-1.783	-1.547

ภาคผนวก ค

ตัวอย่าง Print Out การวิเคราะห์ค่าพารามิเตอร์ข้อสอบ (b)

จากโปรแกรม HLM ด้วยวิธี HGLM – 2L

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

Module: HLM2.EXE (6.04.27107.1)

Date: 15 June 2012, Friday

Time: 18: 9:52

SPECIFICATIONS FOR THIS NONLINEAR HLM2 RUN

Problem Title: no title

The data source for this run = mathlocation.mdm

The command file for this run = whlmtemp.hlm

Output file name = C:\Users\sw\Desktop\math\hlm2.txt

The maximum number of level-1 units = 30000

The maximum number of level-2 units = 1000

The maximum number of micro iterations = 14

Method of estimation: restricted PQL

Maximum number of macro iterations = 100

Distribution at Level-1: Bernoulli

Weighting Specification

Weight

Variable

Weighting?	Name	Normalized?
------------	------	-------------

Level 1 no

Level 2 no

Precision no

The outcome variable is RESULT

The model specified for the fixed effects was:

Level-1	Level-2
Coefficients	Predictors
INTRCPT1, B0	INTRCPT2, G00
# ITEM1 slope, B1	INTRCPT2, G10
# ITEM2 slope, B2	INTRCPT2, G20
# ITEM3 slope, B3	INTRCPT2, G30
# ITEM4 slope, B4	INTRCPT2, G40
# ITEM5 slope, B5	INTRCPT2, G50
# ITEM6 slope, B6	INTRCPT2, G60
# ITEM7 slope, B7	INTRCPT2, G70
# ITEM8 slope, B8	INTRCPT2, G80
# ITEM9 slope, B9	INTRCPT2, G90
# ITEM10 slope, B10	INTRCPT2, G100
# ITEM11 slope, B11	INTRCPT2, G110
# ITEM12 slope, B12	INTRCPT2, G120
# ITEM13 slope, B13	INTRCPT2, G130
# ITEM14 slope, B14	INTRCPT2, G140
# ITEM15 slope, B15	INTRCPT2, G150
# ITEM16 slope, B16	INTRCPT2, G160
# ITEM17 slope, B17	INTRCPT2, G170
# ITEM18 slope, B18	INTRCPT2, G180

ITEM19 slope, B19 INTRCPT2, G190
 # ITEM20 slope, B20 INTRCPT2, G200
 # ITEM21 slope, B21 INTRCPT2, G210
 # ITEM22 slope, B22 INTRCPT2, G220
 # ITEM23 slope, B23 INTRCPT2, G230
 # ITEM24 slope, B24 INTRCPT2, G240
 # ITEM25 slope, B25 INTRCPT2, G250
 # ITEM26 slope, B26 INTRCPT2, G260
 # ITEM27 slope, B27 INTRCPT2, G270
 # ITEM28 slope, B28 INTRCPT2, G280
 # ITEM29 slope, B29 INTRCPT2, G290

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

The model specified for the covariance components was:

Tau dimensions

INTRCPT1

Summary of the model specified (in equation format)

Level-1 Model

$$\text{Prob}(Y=1|B) = P$$

$$\begin{aligned} \log[P/(1-P)] = & B0 + B1*(ITEM1) + B2*(ITEM2) + B3*(ITEM3) + B4*(ITEM4) + \\ & B5*(ITEM5) + B6*(ITEM6) + B7*(ITEM7) + B8*(ITEM8) + B9*(ITEM9) + B10*(ITEM10) + \\ & B11*(ITEM11) + B12*(ITEM12) + B13*(ITEM13) + B14*(ITEM14) + B15*(ITEM15) + \\ & B16*(ITEM16) + B17*(ITEM17) + B18*(ITEM18) + B19*(ITEM19) + B20*(ITEM20) + \\ & B21*(ITEM21) + B22*(ITEM22) + B23*(ITEM23) + B24*(ITEM24) + B25*(ITEM25) + \\ & B26*(ITEM26) + B27*(ITEM27) + B28*(ITEM28) + B29*(ITEM29) \end{aligned}$$

Level-2 Model

$$B_0 = G_{00} + U_0$$

$$B_1 = G_{10}$$

$$B_2 = G_{20}$$

$$B_3 = G_{30}$$

$$B_4 = G_{40}$$

$$B_5 = G_{50}$$

$$B_6 = G_{60}$$

$$B_7 = G_{70}$$

$$B_8 = G_{80}$$

$$B_9 = G_{90}$$

$$B_{10} = G_{100}$$

$$B_{11} = G_{110}$$

$$B_{12} = G_{120}$$

$$B_{13} = G_{130}$$

$$B_{14} = G_{140}$$

$$B_{15} = G_{150}$$

$$B_{16} = G_{160}$$

$$B_{17} = G_{170}$$

$$B_{18} = G_{180}$$

$$B_{19} = G_{190}$$

$$B_{20} = G_{200}$$

$$B_{21} = G_{210}$$

$$B_{22} = G_{220}$$

$$B_{23} = G_{230}$$

$$B_{24} = G_{240}$$

$$B_{25} = G_{250}$$

$$B_{26} = G_{260}$$

$$B_{27} = G_{270}$$

B28 = G280

B29 = G290

Level-1 variance = $1/[P(1-P)]$

The value of the likelihood function at iteration 2 = -1.888248E+004

RESULTS FOR NON-LINEAR MODEL WITH THE LOGIT LINK FUNCTION: Unit-Specific

Model

(macro iteration 6)

Tau

INTRCPT1,B0 0.65112

Tau (as correlations)

INTRCPT1,B0 1.000

Random level-1 coefficient Reliability estimate

INTRCPT1, B0 0.788

The value of the likelihood function at iteration 2 = -4.260353E+004

The outcome variable is RESULT

Final estimation of fixed effects: (Unit-specific model)

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

For INTRCPT1, B0

INTRCPT2, G00	-0.058602	0.071611	-0.818	999	0.414
---------------	-----------	----------	--------	-----	-------

For ITEM1 slope, B1

INTRCPT2, G10	-0.315812	0.095145	-3.319	29970	0.001
For ITEM2 slope, B2					
INTRCPT2, G20	0.291742	0.094873	3.075	29970	0.003
For ITEM3 slope, B3					
INTRCPT2, G30	1.798019	0.110062	16.336	29970	0.000
For ITEM4 slope, B4					
INTRCPT2, G40	0.859545	0.097617	8.805	29970	0.000
For ITEM5 slope, B5					
INTRCPT2, G50	1.477795	0.104486	14.144	29970	0.000
For ITEM6 slope, B6					
INTRCPT2, G60	0.237561	0.094766	2.507	29970	0.012
For ITEM7 slope, B7					
INTRCPT2, G70	0.530455	0.095659	5.545	29970	0.000
For ITEM8 slope, B8					
INTRCPT2, G80	0.804472	0.097215	8.275	29970	0.000
For ITEM9 slope, B9					
INTRCPT2, G90	1.062634	0.099377	10.693	29970	0.000
For ITEM10 slope, B10					
INTRCPT2, G100	0.242067	0.094774	2.554	29970	0.011
For ITEM11 slope, B11					
INTRCPT2, G110	1.084271	0.099591	10.887	29970	0.000
For ITEM12 slope, B12					
INTRCPT2, G120	-0.035807	0.094616	-0.378	29970	0.705
For ITEM13 slope, B13					
INTRCPT2, G130	1.991121	0.114244	17.429	29970	0.000
For ITEM14 slope, B14					
INTRCPT2, G140	0.750208	0.096848	7.746	29970	0.000
For ITEM15 slope, B15					
INTRCPT2, G150	2.008284	0.114648	17.517	29970	0.000

For ITEM16 slope, B16

INTRCPT2, G160	0.423916	0.095245	4.451	29970	0.000
----------------	----------	----------	-------	-------	-------

For ITEM17 slope, B17

INTRCPT2, G170	2.060915	0.115924	17.778	29970	0.000
----------------	----------	----------	--------	-------	-------

For ITEM18 slope, B18

INTRCPT2, G180	-0.845357	0.098170	-8.611	29970	0.000
----------------	-----------	----------	--------	-------	-------

For ITEM19 slope, B19

INTRCPT2, G190	0.558563	0.095785	5.831	29970	0.000
----------------	----------	----------	-------	-------	-------

For ITEM20 slope, B20

INTRCPT2, G200	-0.435842	0.095589	-4.560	29970	0.000
----------------	-----------	----------	--------	-------	-------

For ITEM21 slope, B21

INTRCPT2, G210	-0.053723	0.094629	-0.568	29970	0.570
----------------	-----------	----------	--------	-------	-------

For ITEM22 slope, B22

INTRCPT2, G220	1.200823	0.100839	11.908	29970	0.000
----------------	----------	----------	--------	-------	-------

For ITEM23 slope, B23

INTRCPT2, G230	-0.071650	0.094645	-0.757	29970	0.449
----------------	-----------	----------	--------	-------	-------

For ITEM24 slope, B24

INTRCPT2, G240	-0.044764	0.094622	-0.473	29970	0.636
----------------	-----------	----------	--------	-------	-------

For ITEM25 slope, B25

INTRCPT2, G250	0.920646	0.098100	9.385	29970	0.000
----------------	----------	----------	-------	-------	-------

For ITEM26 slope, B26

INTRCPT2, G260	-1.268170	0.102808	-12.335	29970	0.000
----------------	-----------	----------	---------	-------	-------

For ITEM27 slope, B27

INTRCPT2, G270	1.117049	0.099926	11.179	29970	0.000
----------------	----------	----------	--------	-------	-------

For ITEM28 slope, B28

INTRCPT2, G280	-0.031330	0.094613	-0.331	29970	0.740
----------------	-----------	----------	--------	-------	-------

For ITEM29 slope, B29

INTRCPT2, G290	-0.654942	0.096757	-6.769	29970	0.000
----------------	-----------	----------	--------	-------	-------

Fixed Effect	Coefficient	Odds	Confidence
		Ratio	Interval
For INTRCPT1, B0			
INTRCPT2, G00	-0.058602	0.943082	(0.820,1.085)
For ITEM1 slope, B1			
INTRCPT2, G10	-0.315812	0.729197	(0.605,0.879)
For ITEM2 slope, B2			
INTRCPT2, G20	0.291742	1.338758	(1.112,1.612)
For ITEM3 slope, B3			
INTRCPT2, G30	1.798019	6.037675	(4.866,7.491)
For ITEM4 slope, B4			
INTRCPT2, G40	0.859545	2.362085	(1.951,2.860)
For ITEM5 slope, B5			
INTRCPT2, G50	1.477795	4.383271	(3.572,5.379)
For ITEM6 slope, B6			
INTRCPT2, G60	0.237561	1.268152	(1.053,1.527)
For ITEM7 slope, B7			
INTRCPT2, G70	0.530455	1.699705	(1.409,2.050)
For ITEM8 slope, B8			
INTRCPT2, G80	0.804472	2.235515	(1.848,2.705)
For ITEM9 slope, B9			
INTRCPT2, G90	1.062634	2.893985	(2.382,3.516)
For ITEM10 slope, B10			
INTRCPT2, G100	0.242067	1.273880	(1.058,1.534)
For ITEM11 slope, B11			
INTRCPT2, G110	1.084271	2.957283	(2.433,3.595)
For ITEM12 slope, B12			

INTRCPT2, G120 -0.035807 0.964826 (0.802,1.161)

For ITEM13 slope, B13

INTRCPT2, G130 1.991121 7.323736 (5.854,9.162)

For ITEM14 slope, B14

INTRCPT2, G140 0.750208 2.117441 (1.751,2.560)

For ITEM15 slope, B15

INTRCPT2, G150 2.008284 7.450520 (5.951,9.328)

For ITEM16 slope, B16

INTRCPT2, G160 0.423916 1.527933 (1.268,1.842)

For ITEM17 slope, B17

INTRCPT2, G170 2.060915 7.853155 (6.257,9.856)

For ITEM18 slope, B18

INTRCPT2, G180 -0.845357 0.429404 (0.354,0.521)

For ITEM19 slope, B19

INTRCPT2, G190 0.558563 1.748158 (1.449,2.109)

For ITEM20 slope, B20

INTRCPT2, G200 -0.435842 0.646720 (0.536,0.780)

For ITEM21 slope, B21

INTRCPT2, G210 -0.053723 0.947694 (0.787,1.141)

For ITEM22 slope, B22

INTRCPT2, G220 1.200823 3.322851 (2.727,4.049)

For ITEM23 slope, B23

INTRCPT2, G230 -0.071650 0.930857 (0.773,1.121)

For ITEM24 slope, B24

INTRCPT2, G240 -0.044764 0.956223 (0.794,1.151)

For ITEM25 slope, B25

INTRCPT2, G250 0.920646 2.510911 (2.072,3.043)

For ITEM26 slope, B26

INTRCPT2, G260 -1.268170 0.281346 (0.230,0.344)

For ITEM27 slope, B27

INTRCPT2, G270 1.117049 3.055824 (2.512,3.717)

For ITEM28 slope, B28

INTRCPT2, G280 -0.031330 0.969156 (0.805,1.167)

For ITEM29 slope, B29

INTRCPT2, G290 -0.654942 0.519472 (0.430,0.628)

The outcome variable is RESULT

Final estimation of fixed effects

(Unit-specific model with robust standard errors)

Fixed Effect	Standard		Approx.		
	Coefficient	Error	T-ratio	d.f.	P-value
For INTRCPT1, B0					
INTRCPT2, G00	-0.058602	0.070598	-0.830	999	0.407
For ITEM1 slope, B1					
INTRCPT2, G10	-0.315812	0.093671	-3.371	29970	0.001
For ITEM2 slope, B2					
INTRCPT2, G20	0.291742	0.093836	3.109	29970	0.002
For ITEM3 slope, B3					
INTRCPT2, G30	1.798019	0.108441	16.581	29970	0.000
For ITEM4 slope, B4					
INTRCPT2, G40	0.859545	0.094650	9.081	29970	0.000
For ITEM5 slope, B5					
INTRCPT2, G50	1.477795	0.097035	15.230	29970	0.000
For ITEM6 slope, B6					
INTRCPT2, G60	0.237561	0.095709	2.482	29970	0.013
For ITEM7 slope, B7					

INTRCPT2, G70	0.530455	0.090907	5.835	29970	0.000
For ITEM8 slope, B8					
INTRCPT2, G80	0.804472	0.098596	8.159	29970	0.000
For ITEM9 slope, B9					
INTRCPT2, G90	1.062634	0.093273	11.393	29970	0.000
For ITEM10 slope, B10					
INTRCPT2, G100	0.242067	0.094706	2.556	29970	0.011
For ITEM11 slope, B11					
INTRCPT2, G110	1.084271	0.101199	10.714	29970	0.000
For ITEM12 slope, B12					
INTRCPT2, G120	-0.035807	0.094305	-0.380	29970	0.704
For ITEM13 slope, B13					
INTRCPT2, G130	1.991121	0.110823	17.967	29970	0.000
For ITEM14 slope, B14					
INTRCPT2, G140	0.750208	0.096803	7.750	29970	0.000
For ITEM15 slope, B15					
INTRCPT2, G150	2.008284	0.114179	17.589	29970	0.000
For ITEM16 slope, B16					
INTRCPT2, G160	0.423916	0.094015	4.509	29970	0.000
For ITEM17 slope, B17					
INTRCPT2, G170	2.060915	0.112702	18.286	29970	0.000
For ITEM18 slope, B18					
INTRCPT2, G180	-0.845357	0.097907	-8.634	29970	0.000
For ITEM19 slope, B19					
INTRCPT2, G190	0.558563	0.093475	5.976	29970	0.000
For ITEM20 slope, B20					
INTRCPT2, G200	-0.435842	0.091516	-4.762	29970	0.000
For ITEM21 slope, B21					
INTRCPT2, G210	-0.053723	0.092172	-0.583	29970	0.560

For ITEM22 slope, B22

INTRCPT2, G220	1.200823	0.098233	12.224	29970	0.000
----------------	----------	----------	--------	-------	-------

For ITEM23 slope, B23

INTRCPT2, G230	-0.071650	0.091740	-0.781	29970	0.435
----------------	-----------	----------	--------	-------	-------

For ITEM24 slope, B24

INTRCPT2, G240	-0.044764	0.096421	-0.464	29970	0.642
----------------	-----------	----------	--------	-------	-------

For ITEM25 slope, B25

INTRCPT2, G250	0.920646	0.096948	9.496	29970	0.000
----------------	----------	----------	-------	-------	-------

For ITEM26 slope, B26

INTRCPT2, G260	-1.268170	0.109380	-11.594	29970	0.000
----------------	-----------	----------	---------	-------	-------

For ITEM27 slope, B27

INTRCPT2, G270	1.117049	0.099169	11.264	29970	0.000
----------------	----------	----------	--------	-------	-------

For ITEM28 slope, B28

INTRCPT2, G280	-0.031330	0.091384	-0.343	29970	0.731
----------------	-----------	----------	--------	-------	-------

For ITEM29 slope, B29

INTRCPT2, G290	-0.654942	0.098626	-6.641	29970	0.000
----------------	-----------	----------	--------	-------	-------

Fixed Effect	Coefficient	Odds Ratio	Confidence Interval
--------------	-------------	------------	---------------------

For INTRCPT1, B0

INTRCPT2, G00	-0.058602	0.943082	(0.821, 1.083)
---------------	-----------	----------	----------------

For ITEM1 slope, B1

INTRCPT2, G10	-0.315812	0.729197	(0.607, 0.876)
---------------	-----------	----------	----------------

For ITEM2 slope, B2

INTRCPT2, G20	0.291742	1.338758	(1.114, 1.609)
---------------	----------	----------	----------------

For ITEM3 slope, B3

INTRCPT2, G30	1.798019	6.037675	(4.882, 7.468)
---------------	----------	----------	----------------

For ITEM4 slope, B4

INTRCPT2, G40	0.859545	2.362085	(1.962, 2.844)
---------------	----------	----------	----------------

For ITEM5 slope, B5

INTRCPT2, G50	1.477795	4.383271	(3.624, 5.301)
---------------	----------	----------	----------------

For ITEM6 slope, B6

INTRCPT2, G60	0.237561	1.268152	(1.051, 1.530)
---------------	----------	----------	----------------

For ITEM7 slope, B7

INTRCPT2, G70	0.530455	1.699705	(1.422, 2.031)
---------------	----------	----------	----------------

For ITEM8 slope, B8

INTRCPT2, G80	0.804472	2.235515	(1.843, 2.712)
---------------	----------	----------	----------------

For ITEM9 slope, B9

INTRCPT2, G90	1.062634	2.893985	(2.410, 3.474)
---------------	----------	----------	----------------

For ITEM10 slope, B10

INTRCPT2, G100	0.242067	1.273880	(1.058, 1.534)
----------------	----------	----------	----------------

For ITEM11 slope, B11

INTRCPT2, G110	1.084271	2.957283	(2.425, 3.606)
----------------	----------	----------	----------------

For ITEM12 slope, B12

INTRCPT2, G120	-0.035807	0.964826	(0.802, 1.161)
----------------	-----------	----------	----------------

For ITEM13 slope, B13

INTRCPT2, G130	1.991121	7.323736	(5.894, 9.101)
----------------	----------	----------	----------------

For ITEM14 slope, B14

INTRCPT2, G140	0.750208	2.117441	(1.752, 2.560)
----------------	----------	----------	----------------

For ITEM15 slope, B15

INTRCPT2, G150	2.008284	7.450520	(5.957, 9.319)
----------------	----------	----------	----------------

For ITEM16 slope, B16

INTRCPT2, G160	0.423916	1.527933	(1.271, 1.837)
----------------	----------	----------	----------------

For ITEM17 slope, B17

INTRCPT2, G170	2.060915	7.853155	(6.297, 9.794)
----------------	----------	----------	----------------

For ITEM18 slope, B18

INTRCPT2, G180 -0.845357 0.429404 (0.354, 0.520)

For ITEM19 slope, B19

INTRCPT2, G190 0.558563 1.748158 (1.456, 2.100)

For ITEM20 slope, B20

INTRCPT2, G200 -0.435842 0.646720 (0.541, 0.774)

For ITEM21 slope, B21

INTRCPT2, G210 -0.053723 0.947694 (0.791, 1.135)

For ITEM22 slope, B22

INTRCPT2, G220 1.200823 3.322851 (2.741, 4.028)

For ITEM23 slope, B23

INTRCPT2, G230 -0.071650 0.930857 (0.778, 1.114)

For ITEM24 slope, B24

INTRCPT2, G240 -0.044764 0.956223 (0.792, 1.155)

For ITEM25 slope, B25

INTRCPT2, G250 0.920646 2.510911 (2.076, 3.036)

For ITEM26 slope, B26

INTRCPT2, G260 -1.268170 0.281346 (0.227, 0.349)

For ITEM27 slope, B27

INTRCPT2, G270 1.117049 3.055824 (2.516, 3.711)

For ITEM28 slope, B28

INTRCPT2, G280 -0.031330 0.969156 (0.810, 1.159)

For ITEM29 slope, B29

INTRCPT2, G290 -0.654942 0.519472 (0.428, 0.630)

Final estimation of variance components:

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

INTRCPT1,	U0	0.80692	0.65112	999	4500.27308	0.000
-----------	----	---------	---------	-----	------------	-------

RESULTS FOR NON-LINEAR MODEL WITH THE LOGIT LINK FUNCTION:

Population Average Model

The value of the likelihood function at iteration 2 = -4.164215E+004

The outcome variable is RESULT

Final estimation of fixed effects: (Population-average model)

Fixed Effect	Coefficient	Standard Error	Approx. T-ratio	d.f.	P-value
For INTRCPT1, B0					
INTRCPT2, G00	-0.048009	0.068220	-0.704	999	0.482
For ITEM1 slope, B1					
INTRCPT2, G10	-0.282976	0.090102	-3.141	29970	0.002
For ITEM2 slope, B2					
INTRCPT2, G20	0.260808	0.089707	2.907	29970	0.004
For ITEM3 slope, B3					
INTRCPT2, G30	1.626549	0.104996	15.491	29970	0.000
For ITEM4 slope, B4					
INTRCPT2, G40	0.769793	0.092464	8.325	29970	0.000
For ITEM5 slope, B5					
INTRCPT2, G50	1.331244	0.099422	13.390	29970	0.000

For ITEM6 slope, B6

INTRCPT2, G60	0.212378	0.089605	2.370	29970	0.018
---------------	----------	----------	-------	-------	-------

For ITEM7 slope, B7

INTRCPT2, G70	0.474352	0.090484	5.242	29970	0.000
---------------	----------	----------	-------	-------	-------

For ITEM8 slope, B8

INTRCPT2, G80	0.720228	0.092056	7.824	29970	0.000
---------------	----------	----------	-------	-------	-------

For ITEM9 slope, B9

INTRCPT2, G90	0.953126	0.094253	10.112	29970	0.000
---------------	----------	----------	--------	-------	-------

For ITEM10 slope, B10

INTRCPT2, G100	0.216405	0.089612	2.415	29970	0.016
----------------	----------	----------	-------	-------	-------

For ITEM11 slope, B11

INTRCPT2, G110	0.972714	0.094470	10.296	29970	0.000
----------------	----------	----------	--------	-------	-------

For ITEM12 slope, B12

INTRCPT2, G120	-0.032033	0.089499	-0.358	29970	0.720
----------------	-----------	----------	--------	-------	-------

For ITEM13 slope, B13

INTRCPT2, G130	1.806282	0.109126	16.552	29970	0.000
----------------	----------	----------	--------	-------	-------

For ITEM14 slope, B14

INTRCPT2, G140	0.671446	0.091685	7.323	29970	0.000
----------------	----------	----------	-------	-------	-------

For ITEM15 slope, B15

INTRCPT2, G150	1.822317	0.109523	16.639	29970	0.000
----------------	----------	----------	--------	-------	-------

For ITEM16 slope, B16

INTRCPT2, G160	0.378998	0.090071	4.208	29970	0.000
----------------	----------	----------	-------	-------	-------

For ITEM17 slope, B17

INTRCPT2, G170	1.871553	0.110774	16.895	29970	0.000
----------------	----------	----------	--------	-------	-------

For ITEM18 slope, B18

INTRCPT2, G180	-0.761467	0.093315	-8.160	29970	0.000
----------------	-----------	----------	--------	-------	-------

For ITEM19 slope, B19

INTRCPT2, G190	0.499527	0.090611	5.513	29970	0.000
----------------	----------	----------	-------	-------	-------

For ITEM20 slope, B20

INTRCPT2, G200 -0.390898 0.090585 -4.315 29970 0.000

For ITEM21 slope, B21

INTRCPT2, G210 -0.048064 0.089516 -0.537 29970 0.591

For ITEM22 slope, B22

INTRCPT2, G220 1.078442 0.095737 11.265 29970 0.000

For ITEM23 slope, B23

INTRCPT2, G230 -0.064107 0.089536 -0.716 29970 0.474

For ITEM24 slope, B24

INTRCPT2, G240 -0.040047 0.089507 -0.447 29970 0.654

For ITEM25 slope, B25

INTRCPT2, G250 0.824854 0.092955 8.874 29970 0.000

For ITEM26 slope, B26

INTRCPT2, G260 -1.149043 0.098082 -11.715 29970 0.000

For ITEM27 slope, B27

INTRCPT2, G270 1.002412 0.094811 10.573 29970 0.000

For ITEM28 slope, B28

INTRCPT2, G280 -0.028027 0.089495 -0.313 29970 0.754

For ITEM29 slope, B29

INTRCPT2, G290 -0.588650 0.091831 -6.410 29970 0.000

	Odds	Confidence
Fixed Effect	Coefficient	Ratio Interval
For INTRCPT1, B0		
INTRCPT2, G00	-0.048009	0.953125 (0.834,1.089)
For ITEM1 slope, B1		
INTRCPT2, G10	-0.282976	0.753538 (0.632,0.899)
For ITEM2 slope, B2		
INTRCPT2, G20	0.260808	1.297979 (1.089,1.547)

For ITEM3 slope, B3

INTRCPT2, G30	1.626549	5.086292	(4.140,6.249)
---------------	----------	----------	---------------

For ITEM4 slope, B4

INTRCPT2, G40	0.769793	2.159320	(1.801,2.588)
---------------	----------	----------	---------------

For ITEM5 slope, B5

INTRCPT2, G50	1.331244	3.785750	(3.115,4.600)
---------------	----------	----------	---------------

For ITEM6 slope, B6

INTRCPT2, G60	0.212378	1.236615	(1.037,1.474)
---------------	----------	----------	---------------

For ITEM7 slope, B7

INTRCPT2, G70	0.474352	1.606972	(1.346,1.919)
---------------	----------	----------	---------------

For ITEM8 slope, B8

INTRCPT2, G80	0.720228	2.054902	(1.716,2.461)
---------------	----------	----------	---------------

For ITEM9 slope, B9

INTRCPT2, G90	0.953126	2.593804	(2.156,3.120)
---------------	----------	----------	---------------

For ITEM10 slope, B10

INTRCPT2, G100	0.216405	1.241606	(1.042,1.480)
----------------	----------	----------	---------------

For ITEM11 slope, B11

INTRCPT2, G110	0.972714	2.645114	(2.198,3.183)
----------------	----------	----------	---------------

For ITEM12 slope, B12

INTRCPT2, G120	-0.032033	0.968474	(0.813,1.154)
----------------	-----------	----------	---------------

For ITEM13 slope, B13

INTRCPT2, G130	1.806282	6.087770	(4.916,7.540)
----------------	----------	----------	---------------

For ITEM14 slope, B14

INTRCPT2, G140	0.671446	1.957066	(1.635,2.342)
----------------	----------	----------	---------------

For ITEM15 slope, B15

INTRCPT2, G150	1.822317	6.186178	(4.991,7.667)
----------------	----------	----------	---------------

For ITEM16 slope, B16

INTRCPT2, G160	0.378998	1.460820	(1.224,1.743)
----------------	----------	----------	---------------

For ITEM17 slope, B17

INTRCPT2, G170 1.871553 6.498377 (5.230,8.074)

For ITEM18 slope, B18

INTRCPT2, G180 -0.761467 0.466981 (0.389,0.561)

For ITEM19 slope, B19

INTRCPT2, G190 0.499527 1.647941 (1.380,1.968)

For ITEM20 slope, B20

INTRCPT2, G200 -0.390898 0.676449 (0.566,0.808)

For ITEM21 slope, B21

INTRCPT2, G210 -0.048064 0.953073 (0.800,1.136)

For ITEM22 slope, B22

INTRCPT2, G220 1.078442 2.940096 (2.437,3.547)

For ITEM23 slope, B23

INTRCPT2, G230 -0.064107 0.937904 (0.787,1.118)

For ITEM24 slope, B24

INTRCPT2, G240 -0.040047 0.960744 (0.806,1.145)

For ITEM25 slope, B25

INTRCPT2, G250 0.824854 2.281549 (1.902,2.738)

For ITEM26 slope, B26

INTRCPT2, G260 -1.149043 0.316940 (0.262,0.384)

For ITEM27 slope, B27

INTRCPT2, G270 1.002412 2.724847 (2.263,3.281)

For ITEM28 slope, B28

INTRCPT2, G280 -0.028027 0.972362 (0.816,1.159)

For ITEM29 slope, B29

INTRCPT2, G290 -0.588650 0.555076 (0.464,0.665)

The outcome variable is RESULT

Final estimation of fixed effects

(Population-average model with robust standard errors)

		Standard	Approx.			
Fixed Effect	Coefficient	Error	T-ratio	d.f.	P-value	
For INTRCPT1, B0						
INTRCPT2, G00	-0.048009	0.063272	-0.759	999	0.448	
For ITEM1 slope, B1						
INTRCPT2, G10	-0.282976	0.084077	-3.366	29970	0.001	
For ITEM2 slope, B2						
INTRCPT2, G20	0.260808	0.083897	3.109	29970	0.002	
For ITEM3 slope, B3						
INTRCPT2, G30	1.626549	0.099210	16.395	29970	0.000	
For ITEM4 slope, B4						
INTRCPT2, G40	0.769793	0.085194	9.036	29970	0.000	
For ITEM5 slope, B5						
INTRCPT2, G50	1.331244	0.088666	15.014	29970	0.000	
For ITEM6 slope, B6						
INTRCPT2, G60	0.212378	0.085556	2.482	29970	0.013	
For ITEM7 slope, B7						
INTRCPT2, G70	0.474352	0.081371	5.829	29970	0.000	
For ITEM8 slope, B8						
INTRCPT2, G80	0.720228	0.088515	8.137	29970	0.000	
For ITEM9 slope, B9						
INTRCPT2, G90	0.953126	0.084312	11.305	29970	0.000	
For ITEM10 slope, B10						
INTRCPT2, G100	0.216405	0.084708	2.555	29970	0.011	

For ITEM11 slope, B11

INTRCPT2, G110	0.972714	0.091402	10.642	29970	0.000
----------------	----------	----------	--------	-------	-------

For ITEM12 slope, B12

INTRCPT2, G120	-0.032033	0.084385	-0.380	29970	0.704
----------------	-----------	----------	--------	-------	-------

For ITEM13 slope, B13

INTRCPT2, G130	1.806282	0.102296	17.657	29970	0.000
----------------	----------	----------	--------	-------	-------

For ITEM14 slope, B14

INTRCPT2, G140	0.671446	0.086899	7.727	29970	0.000
----------------	----------	----------	-------	-------	-------

For ITEM15 slope, B15

INTRCPT2, G150	1.822317	0.105690	17.242	29970	0.000
----------------	----------	----------	--------	-------	-------

For ITEM16 slope, B16

INTRCPT2, G160	0.378998	0.084025	4.511	29970	0.000
----------------	----------	----------	-------	-------	-------

For ITEM17 slope, B17

INTRCPT2, G170	1.871553	0.104585	17.895	29970	0.000
----------------	----------	----------	--------	-------	-------

For ITEM18 slope, B18

INTRCPT2, G180	-0.761467	0.088693	-8.585	29970	0.000
----------------	-----------	----------	--------	-------	-------

For ITEM19 slope, B19

INTRCPT2, G190	0.499527	0.083690	5.969	29970	0.000
----------------	----------	----------	-------	-------	-------

For ITEM20 slope, B20

INTRCPT2, G200	-0.390898	0.082319	-4.749	29970	0.000
----------------	-----------	----------	--------	-------	-------

For ITEM21 slope, B21

INTRCPT2, G210	-0.048064	0.082486	-0.583	29970	0.560
----------------	-----------	----------	--------	-------	-------

For ITEM22 slope, B22

INTRCPT2, G220	1.078442	0.088970	12.121	29970	0.000
----------------	----------	----------	--------	-------	-------

For ITEM23 slope, B23

INTRCPT2, G230	-0.064107	0.082121	-0.781	29970	0.435
----------------	-----------	----------	--------	-------	-------

For ITEM24 slope, B24

INTRCPT2, G240	-0.040047	0.086278	-0.464	29970	0.642
----------------	-----------	----------	--------	-------	-------

For ITEM25 slope, B25

INTRCPT2, G250	0.824854	0.087266	9.452	29970	0.000
For ITEM26 slope, B26					
INTRCPT2, G260	-1.149043	0.099524	-11.545	29970	0.000
For ITEM27 slope, B27					
INTRCPT2, G270	1.002412	0.089493	11.201	29970	0.000
For ITEM28 slope, B28					
INTRCPT2, G280	-0.028027	0.081774	-0.343	29970	0.732
For ITEM29 slope, B29					
INTRCPT2, G290	-0.588650	0.088722	-6.635	29970	0.000

Fixed Effect	Coefficient	Odds Confidence	
		Ratio	Interval
For INTRCPT1, B0			
INTRCPT2, G00	-0.048009	0.953125	(0.842,1.079)
For ITEM1 slope, B1			
INTRCPT2, G10	-0.282976	0.753538	(0.639,0.889)
For ITEM2 slope, B2			
INTRCPT2, G20	0.260808	1.297979	(1.101,1.530)
For ITEM3 slope, B3			
INTRCPT2, G30	1.626549	5.086292	(4.187,6.178)
For ITEM4 slope, B4			
INTRCPT2, G40	0.769793	2.159320	(1.827,2.552)
For ITEM5 slope, B5			
INTRCPT2, G50	1.331244	3.785750	(3.182,4.504)
For ITEM6 slope, B6			
INTRCPT2, G60	0.212378	1.236615	(1.046,1.462)
For ITEM7 slope, B7			
INTRCPT2, G70	0.474352	1.606972	(1.370,1.885)

For ITEM8 slope, B8

INTRCPT2, G80	0.720228	2.054902	(1.728,2.444)
---------------	----------	----------	---------------

For ITEM9 slope, B9

INTRCPT2, G90	0.953126	2.593804	(2.199,3.060)
---------------	----------	----------	---------------

For ITEM10 slope, B10

INTRCPT2, G100	0.216405	1.241606	(1.052,1.466)
----------------	----------	----------	---------------

For ITEM11 slope, B11

INTRCPT2, G110	0.972714	2.645114	(2.211,3.164)
----------------	----------	----------	---------------

For ITEM12 slope, B12

INTRCPT2, G120	-0.032033	0.968474	(0.821,1.143)
----------------	-----------	----------	---------------

For ITEM13 slope, B13

INTRCPT2, G130	1.806282	6.087770	(4.982,7.439)
----------------	----------	----------	---------------

For ITEM14 slope, B14

INTRCPT2, G140	0.671446	1.957066	(1.651,2.320)
----------------	----------	----------	---------------

For ITEM15 slope, B15

INTRCPT2, G150	1.822317	6.186178	(5.029,7.610)
----------------	----------	----------	---------------

For ITEM16 slope, B16

INTRCPT2, G160	0.378998	1.460820	(1.239,1.722)
----------------	----------	----------	---------------

For ITEM17 slope, B17

INTRCPT2, G170	1.871553	6.498377	(5.294,7.977)
----------------	----------	----------	---------------

For ITEM18 slope, B18

INTRCPT2, G180	-0.761467	0.466981	(0.392,0.556)
----------------	-----------	----------	---------------

For ITEM19 slope, B19

INTRCPT2, G190	0.499527	1.647941	(1.399,1.942)
----------------	----------	----------	---------------

For ITEM20 slope, B20

INTRCPT2, G200	-0.390898	0.676449	(0.576,0.795)
----------------	-----------	----------	---------------

For ITEM21 slope, B21

INTRCPT2, G210	-0.048064	0.953073	(0.811,1.120)
----------------	-----------	----------	---------------

For ITEM22 slope, B22

INTRCPT2, G220	1.078442	2.940096	(2.470,3.500)
For ITEM23 slope, B23			
INTRCPT2, G230	-0.064107	0.937904	(0.798,1.102)
For ITEM24 slope, B24			
INTRCPT2, G240	-0.040047	0.960744	(0.811,1.138)
For ITEM25 slope, B25			
INTRCPT2, G250	0.824854	2.281549	(1.923,2.707)
For ITEM26 slope, B26			
INTRCPT2, G260	-1.149043	0.316940	(0.261,0.385)
For ITEM27 slope, B27			
INTRCPT2, G270	1.002412	2.724847	(2.286,3.247)
For ITEM28 slope, B28			
INTRCPT2, G280	-0.028027	0.972362	(0.828,1.141)
For ITEM29 slope, B29			
INTRCPT2, G290	-0.588650	0.555076	(0.466,0.661)

ภาคผนวก

ตัวอย่าง Print Out การวิเคราะห์ค่าพารามิเตอร์ข้อสอบ (b_i) จากโปรแกรม Mplus ด้วยวิธี MIMIC

Mplus VERSION 6.12

MUTHEN & MUTHEN

01/09/2013 6:31 PM

INPUT INSTRUCTIONS

TITLE: Run DIF by Mplus using MIMIC method

DATA: FILE IS "C:\Documents and

Settings\Administrator\Desktop\thai(sex)\datatest(thai).dat";

MODEL RESULTS

		Two-Tailed		
		Estimate	S.E.	Est./S.E.
THAI	BY			P-Value
A1		0.838	0.025	33.630
A2		0.838	0.025	33.630
A3		0.838	0.025	33.630
A4		0.838	0.025	33.630
A5		0.838	0.025	33.630
A6		0.838	0.025	33.630
A7		0.838	0.025	33.630
A8		0.838	0.025	33.630
A9		0.838	0.025	33.630
A10		0.838	0.025	33.630
A11		0.838	0.025	33.630
A12		0.838	0.025	33.630
A13		0.838	0.025	33.630
A14		0.838	0.025	33.630
A15		0.838	0.025	33.630
A16		0.838	0.025	33.630
A17		0.838	0.025	33.630

A18	0.838	0.025	33.630	0.000
A19	0.838	0.025	33.630	0.000
A20	0.838	0.025	33.630	0.000
A21	0.838	0.025	33.630	0.000
A22	0.838	0.025	33.630	0.000
A23	0.838	0.025	33.630	0.000
A24	0.838	0.025	33.630	0.000
A25	0.838	0.025	33.630	0.000
A26	0.838	0.025	33.630	0.000
A27	0.838	0.025	33.630	0.000
A28	0.838	0.025	33.630	0.000
A29	0.838	0.025	33.630	0.000
A30	0.838	0.025	33.630	0.000
Means				
THAI	0.000	0.000	999.000	999.000
Thresholds				
A1\$1	0.386	0.074	5.230	0.000
A2\$1	-0.242	0.073	-3.300	0.001
A3\$1	-1.790	0.092	-19.372	0.000
A4\$1	-0.827	0.077	-10.760	0.000
A5\$1	-1.464	0.086	-17.096	0.000
A6\$1	-0.186	0.073	-2.536	0.011
A7\$1	-0.488	0.074	-6.559	0.000
A8\$1	-0.770	0.076	-10.082	0.000
A9\$1	-1.037	0.079	-13.095	0.000
A10\$1	-0.191	0.073	-2.603	0.009
A11\$1	-1.058	0.079	-13.320	0.000
A12\$1	0.096	0.073	1.321	0.187
A13\$1	-1.989	0.097	-20.407	0.000

A14\$1	-0.714	0.076	-9.409	0.000
A15\$1	-2.006	0.098	-20.484	0.000
A16\$1	-0.378	0.074	-5.123	0.000
A17\$1	-2.061	0.099	-20.720	0.000
A18\$1	0.933	0.078	12.000	0.000
A19\$1	-0.517	0.075	-6.935	0.000
A20\$1	0.509	0.074	6.852	0.000
A21\$1	0.115	0.073	1.571	0.116
A22\$1	-1.178	0.081	-14.540	0.000
A23\$1	0.134	0.073	1.828	0.067
A24\$1	0.106	0.073	1.447	0.148
A25\$1	-0.890	0.078	-11.475	0.000
A26\$1	1.369	0.084	16.361	0.000
A27\$1	-1.092	0.080	-13.669	0.000
A28\$1	0.092	0.073	1.257	0.209
A29\$1	0.737	0.076	9.705	0.000
A30\$1	0.060	0.073	0.816	0.415

Variances

THAI	1.000	0.000	999.000	999.000
------	-------	-------	---------	---------

IRT PARAMETERIZATION IN TWO-PARAMETER LOGISTIC METRIC

WHERE THE LOGIT IS $1.7 \times \text{DISCRIMINATION} \times (\text{THETA} - \text{DIFFICULTY})$

Item Discriminations

THAI BY

A1	0.493	0.015	33.630	0.000
A2	0.493	0.015	33.630	0.000
A3	0.493	0.015	33.630	0.000
A4	0.493	0.015	33.630	0.000
A5	0.493	0.015	33.630	0.000

A6	0.493	0.015	33.630	0.000
A7	0.493	0.015	33.630	0.000
A8	0.493	0.015	33.630	0.000
A9	0.493	0.015	33.630	0.000
A10	0.493	0.015	33.630	0.000
A11	0.493	0.015	33.630	0.000
A12	0.493	0.015	33.630	0.000
A13	0.493	0.015	33.630	0.000
A14	0.493	0.015	33.630	0.000
A15	0.493	0.015	33.630	0.000
A16	0.493	0.015	33.630	0.000
A17	0.493	0.015	33.630	0.000
A18	0.493	0.015	33.630	0.000
A19	0.493	0.015	33.630	0.000
A20	0.493	0.015	33.630	0.000
A21	0.493	0.015	33.630	0.000
A22	0.493	0.015	33.630	0.000
A23	0.493	0.015	33.630	0.000
A24	0.493	0.015	33.630	0.000
A25	0.493	0.015	33.630	0.000
A26	0.493	0.015	33.630	0.000
A27	0.493	0.015	33.630	0.000
A28	0.493	0.015	33.630	0.000
A29	0.493	0.015	33.630	0.000
A30	0.493	0.015	33.630	0.000
Means				
THAI	0.000	0.000	0.000	1.000
Item Difficulties				
A1\$1	0.460	0.089	5.181	0.000

A2\$1	-0.289	0.088	-3.288	0.001
A3\$1	-2.137	0.124	-17.189	0.000
A4\$1	-0.988	0.095	-10.344	0.000
A5\$1	-1.747	0.112	-15.548	0.000
A6\$1	-0.222	0.088	-2.530	0.011
A7\$1	-0.582	0.090	-6.461	0.000
A8\$1	-0.919	0.094	-9.738	0.000
A9\$1	-1.237	0.100	-12.363	0.000
A10\$1	-0.227	0.088	-2.597	0.009
A11\$1	-1.263	0.101	-12.552	0.000
A12\$1	0.115	0.087	1.320	0.187
A13\$1	-2.373	0.133	-17.891	0.000
A14\$1	-0.852	0.093	-9.127	0.000
A15\$1	-2.394	0.133	-17.942	0.000
A16\$1	-0.451	0.089	-5.076	0.000
A17\$1	-2.460	0.136	-18.098	0.000
A18\$1	1.113	0.097	11.432	0.000
A19\$1	-0.617	0.090	-6.820	0.000
A20\$1	0.608	0.090	6.741	0.000
A21\$1	0.137	0.087	1.569	0.117
A22\$1	-1.406	0.104	-13.556	0.000
A23\$1	0.159	0.087	1.826	0.068
A24\$1	0.126	0.087	1.446	0.148
A25\$1	-1.062	0.097	-10.974	0.000
A26\$1	1.634	0.109	14.995	0.000
A27\$1	-1.303	0.101	-12.843	0.000
A28\$1	0.110	0.087	1.257	0.209
A29\$1	0.879	0.094	9.398	0.000
A30\$1	0.071	0.087	0.815	0.415

Variances

THAI	1.000	0.000	0.000	1.000
------	-------	-------	-------	-------

STANDARDIZED MODEL RESULTS

STDYX Standardization

		Two-Tailed			
		Estimate	S.E.	Est./S.E.	P-Value
THAI	BY				
A1		0.419	0.010	40.808	0.000
A2		0.419	0.010	40.808	0.000
A3		0.419	0.010	40.808	0.000
A4		0.419	0.010	40.808	0.000
A5		0.419	0.010	40.808	0.000
A6		0.419	0.010	40.808	0.000
A7		0.419	0.010	40.808	0.000
A8		0.419	0.010	40.808	0.000
A9		0.419	0.010	40.808	0.000
A10		0.419	0.010	40.808	0.000
A11		0.419	0.010	40.808	0.000
A12		0.419	0.010	40.808	0.000
A13		0.419	0.010	40.808	0.000
A14		0.419	0.010	40.808	0.000
A15		0.419	0.010	40.808	0.000
A16		0.419	0.010	40.808	0.000
A17		0.419	0.010	40.808	0.000
A18		0.419	0.010	40.808	0.000
A19		0.419	0.010	40.808	0.000
A20		0.419	0.010	40.808	0.000
A21		0.419	0.010	40.808	0.000

A22	0.419	0.010	40.808	0.000
A23	0.419	0.010	40.808	0.000
A24	0.419	0.010	40.808	0.000
A25	0.419	0.010	40.808	0.000
A26	0.419	0.010	40.808	0.000
A27	0.419	0.010	40.808	0.000
A28	0.419	0.010	40.808	0.000
A29	0.419	0.010	40.808	0.000
A30	0.419	0.010	40.808	0.000
Means				
THAI	0.000	0.000	999.000	999.000
Thresholds				
A1\$1	0.193	0.037	5.230	0.000
A2\$1	-0.121	0.037	-3.300	0.001
A3\$1	-0.896	0.046	-19.377	0.000
A4\$1	-0.414	0.038	-10.762	0.000
A5\$1	-0.733	0.043	-17.102	0.000
A6\$1	-0.093	0.037	-2.536	0.011
A7\$1	-0.244	0.037	-6.559	0.000
A8\$1	-0.385	0.038	-10.084	0.000
A9\$1	-0.519	0.040	-13.098	0.000
A10\$1	-0.095	0.037	-2.603	0.009
A11\$1	-0.530	0.040	-13.323	0.000
A12\$1	0.048	0.037	1.321	0.187
A13\$1	-0.995	0.049	-20.411	0.000
A14\$1	-0.357	0.038	-9.410	0.000
A15\$1	-1.004	0.049	-20.488	0.000
A16\$1	-0.189	0.037	-5.123	0.000
A17\$1	-1.032	0.050	-20.724	0.000

A18\$1	0.467	0.039	12.003	0.000
A19\$1	-0.259	0.037	-6.935	0.000
A20\$1	0.255	0.037	6.853	0.000
A21\$1	0.057	0.037	1.571	0.116
A22\$1	-0.590	0.041	-14.545	0.000
A23\$1	0.067	0.037	1.828	0.067
A24\$1	0.053	0.037	1.447	0.148
A25\$1	-0.445	0.039	-11.477	0.000
A26\$1	0.685	0.042	16.368	0.000
A27\$1	-0.546	0.040	-13.673	0.000
A28\$1	0.046	0.037	1.257	0.209
A29\$1	0.369	0.038	9.707	0.000
A30\$1	0.030	0.037	0.816	0.415

Variances

THAI	1.000	0.000	999.000	999.000
------	-------	-------	---------	---------

R-SQUARE

Variable	Observed		Two-Tailed	
	Estimate	S.E.	Est./S.E.	P-Value
A1	0.176	0.009	20.404	0.000
A2	0.176	0.009	20.404	0.000
A3	0.176	0.009	20.404	0.000
A4	0.176	0.009	20.404	0.000
A5	0.176	0.009	20.404	0.000
A6	0.176	0.009	20.404	0.000
A7	0.176	0.009	20.404	0.000
A8	0.176	0.009	20.404	0.000
A9	0.176	0.009	20.404	0.000
A10	0.176	0.009	20.404	0.000

A11	0.176	0.009	20.404	0.000
A12	0.176	0.009	20.404	0.000
A13	0.176	0.009	20.404	0.000
A14	0.176	0.009	20.404	0.000
A15	0.176	0.009	20.404	0.000
A16	0.176	0.009	20.404	0.000
A17	0.176	0.009	20.404	0.000
A18	0.176	0.009	20.404	0.000
A19	0.176	0.009	20.404	0.000
A20	0.176	0.009	20.404	0.000
A21	0.176	0.009	20.404	0.000
A22	0.176	0.009	20.404	0.000
A23	0.176	0.009	20.404	0.000
A24	0.176	0.009	20.404	0.000
A25	0.176	0.009	20.404	0.000
A26	0.176	0.009	20.404	0.000
A27	0.176	0.009	20.404	0.000
A28	0.176	0.009	20.404	0.000
A29	0.176	0.009	20.404	0.000
A30	0.176	0.009	20.404	0.000

Beginning Time: 18:31:36

Ending Time: 18:31:38

Elapsed Time: 00:00:02

3463 Stoner Ave. Los Angeles, CA 90066, Tel: (310) 391-9971, Fax: (310) 391-8971

Web: www.StatModel.com, Support: Support@StatModel.com, Copyright (c) 1998-2011

Muthen & Muthen,

Mplus VERSION 6.12

ภาคผนวก จ

ตัวอย่าง Print Out การวิเคราะห์ค่าพารามิเตอร์ข้อสอบ (b) จากโปรแกรม Winbugs ด้วยวิธี
BAYESIAN

Syntax for an IRT-Rash Model by WinBUGS

```

model
{
  for (j in 1 : N) {
    for (i in 1 : n) {
      logit(p[j, i]) <- a * ( z[j] - b[i] ) # b[i] is difficulty
      U[j, i] ~ dbern(p[j, i])
    }
    z[j] ~ dnorm(0, 1)
  }
  #####
  # Priors
  #####
  for (i in 1: n) {
    b[i] ~ dnorm(0,1)
    beta[i] <- b[i] - mean(b[])
  }
  a ~ dnorm(0,0.0001) I(0,)
}

```

ภาคผนวก จ

ตัวอย่าง Print Out การวิเคราะห์การทำหน้าที่ต่างกันของข้อสอบ (DIF)

จากโปรแกรม HLM ด้วยวิธี HGLM – 2L

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

Module: HLM2.EXE (6.04.27107.1)

Date: 9 March 2013, Saturday

Time: 21:34:39

SPECIFICATIONS FOR THIS NONLINEAR HLM2 RUN

Problem Title: no title

The data source for this run = thai.mdm

The command file for this run = whlmtemp.hlm

Output file name = C:\Users\sw\Desktop\Thai\hlm2.txt

The maximum number of level-1 units = 30000

The maximum number of level-2 units = 1000

The maximum number of micro iterations = 14

Method of estimation: restricted PQL

Maximum number of macro iterations = 100

Distribution at Level-1: Bernoulli

Weighting Specification

Weight

Variable

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

The outcome variable is RESULT

The model specified for the fixed effects was:

Level-1	Level-2
Coefficients	Predictors
INTRCPT1, B0	INTRCPT2, G00
	SEX, G01
# ITEM1 slope, B1	INTRCPT2, G10
	SEX, G11
# ITEM2 slope, B2	INTRCPT2, G20
	SEX, G21
# ITEM3 slope, B3	INTRCPT2, G30
	SEX, G31
# ITEM4 slope, B4	INTRCPT2, G40
	SEX, G41
# ITEM5 slope, B5	INTRCPT2, G50
	SEX, G51
# ITEM6 slope, B6	INTRCPT2, G60
	SEX, G61
# ITEM7 slope, B7	INTRCPT2, G70
	SEX, G71
# ITEM8 slope, B8	INTRCPT2, G80
	SEX, G81
# ITEM9 slope, B9	INTRCPT2, G90
	SEX, G91
# ITEM10 slope, B10	INTRCPT2, G100
	SEX, G101
# ITEM11 slope, B11	INTRCPT2, G110

SEX, G111

ITEM12 slope, B12 INTRCPT2, G120

SEX, G121

ITEM13 slope, B13 INTRCPT2, G130

SEX, G131

ITEM14 slope, B14 INTRCPT2, G140

SEX, G141

ITEM15 slope, B15 INTRCPT2, G150

SEX, G151

ITEM16 slope, B16 INTRCPT2, G160

SEX, G161

ITEM17 slope, B17 INTRCPT2, G170

SEX, G171

ITEM18 slope, B18 INTRCPT2, G180

SEX, G181

ITEM19 slope, B19 INTRCPT2, G190

SEX, G191

ITEM20 slope, B20 INTRCPT2, G200

SEX, G201

ITEM21 slope, B21 INTRCPT2, G210

SEX, G211

ITEM22 slope, B22 INTRCPT2, G220

SEX, G221

ITEM23 slope, B23 INTRCPT2, G230

SEX, G231

ITEM24 slope, B24 INTRCPT2, G240

SEX, G241

ITEM25 slope, B25 INTRCPT2, G250

SEX, G251

ITEM26 slope, B26 INTRCPT2, G260

SEX, G261

ITEM27 slope, B27 INTRCPT2, G270

SEX, G271

ITEM28 slope, B28 INTRCPT2, G280

SEX, G281

ITEM29 slope, B29 INTRCPT2, G290

SEX, G291

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

The model specified for the covariance components was:

Tau dimensions

INTRCPT1

Summary of the model specified (in equation format)

Level-1 Model

$$\text{Prob}(Y=1|B) = P$$

$$\begin{aligned} \log[P/(1-P)] = & B0 + B1*(ITEM1) + B2*(ITEM2) + B3*(ITEM3) + B4*(ITEM4) + B5*(ITEM5) \\ & + B6*(ITEM6) + B7*(ITEM7) + B8*(ITEM8) + B9*(ITEM9) + B10*(ITEM10) + \\ & B11*(ITEM11) + B12*(ITEM12) + B13*(ITEM13) + B14*(ITEM14) + B15*(ITEM15) + \\ & B16*(ITEM16) + B17*(ITEM17) + B18*(ITEM18) + B19*(ITEM19) + B20*(ITEM20) + \\ & B21*(ITEM21) + B22*(ITEM22) + B23*(ITEM23) + B24*(ITEM24) + B25*(ITEM25) + \\ & B26*(ITEM26) + B27*(ITEM27) + B28*(ITEM28) + B29*(ITEM29) \end{aligned}$$

Level-2 Model

$$B0 = G00 + G01*(SEX) + U0$$

$$B1 = G10 + G11*(SEX)$$

$$B2 = G20 + G21*(SEX)$$

$$B3 = G30 + G31*(SEX)$$

$$B4 = G40 + G41*(SEX)$$

$$B5 = G50 + G51*(SEX)$$

$$B6 = G60 + G61*(SEX)$$

$$B7 = G70 + G71*(SEX)$$

$$B8 = G80 + G81*(SEX)$$

$$B9 = G90 + G91*(SEX)$$

$$B10 = G100 + G101*(SEX)$$

$$B11 = G110 + G111*(SEX)$$

$$B12 = G120 + G121*(SEX)$$

$$B13 = G130 + G131*(SEX)$$

$$B14 = G140 + G141*(SEX)$$

$$B15 = G150 + G151*(SEX)$$

$$B16 = G160 + G161*(SEX)$$

$$B17 = G170 + G171*(SEX)$$

$$B18 = G180 + G181*(SEX)$$

$$B19 = G190 + G191*(SEX)$$

$$B20 = G200 + G201*(SEX)$$

$$B21 = G210 + G211*(SEX)$$

$$B22 = G220 + G221*(SEX)$$

$$B23 = G230 + G231*(SEX)$$

$$B24 = G240 + G241*(SEX)$$

$$B25 = G250 + G251*(SEX)$$

$$B26 = G260 + G261*(SEX)$$

$$B27 = G270 + G271*(SEX)$$

$$B28 = G280 + G281*(SEX)$$

$$B29 = G290 + G291*(SEX)$$

$$\text{Level-1 variance} = 1/[P(1-P)]$$

The value of the likelihood function at iteration 2 = -1.889069E+004

RESULTS FOR NON-LINEAR MODEL WITH THE LOGIT LINK FUNCTION:

Unit-Specific Model

(macro iteration 7)

Tau

INTRCPT1,B0 0.60925

Tau (as correlations)

INTRCPT1,B0 1.000

Random level-1 coefficient Reliability estimate-----
INTRCPT1, B0 0.776

The value of the likelihood function at iteration 2 = -4.262925E+004

The outcome variable is RESULT

Final estimation of fixed effects: (Unit-specific model)

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

For INTRCPT1, B0

INTRCPT2, G00 0.587254 0.119229 4.925 998 0.000

SEX, G01 -1.033451 0.150305 -6.876 998 0.000

For ITEM1 slope, B1

INTRCPT2, G10 -0.764874 0.156130 -4.899 29940 0.000

SEX, G11 0.720359 0.198031 3.638 29940 0.001

For ITEM2 slope, B2

INTRCPT2, G20 0.012604 0.158771 0.079 29940 0.937

SEX, G21 0.449173 0.199349 2.253 29940 0.024

For ITEM3 slope, B3

INTRCPT2, G30	1.432886	0.191841	7.469	29940	0.000
SEX, G31	0.585644	0.235282	2.489	29940	0.013

For ITEM4 slope, B4

INTRCPT2, G40	0.715113	0.169557	4.218	29940	0.000
SEX, G41	0.255278	0.208985	1.222	29940	0.222

For ITEM5 slope, B5

INTRCPT2, G50	1.166608	0.181954	6.412	29940	0.000
SEX, G51	0.506352	0.223450	2.266	29940	0.023

For ITEM6 slope, B6

INTRCPT2, G60	-0.050064	0.158223	-0.316	29940	0.752
SEX, G61	0.461889	0.198912	2.322	29940	0.020

For ITEM7 slope, B7

INTRCPT2, G70	0.127822	0.159942	0.799	29940	0.424
SEX, G71	0.643045	0.200665	3.205	29940	0.002

For ITEM8 slope, B8

INTRCPT2, G80	0.273808	0.161741	1.693	29940	0.090
SEX, G81	0.841604	0.203309	4.140	29940	0.000

For ITEM9 slope, B9

INTRCPT2, G90	0.715113	0.169557	4.218	29940	0.000
SEX, G91	0.558785	0.210413	2.656	29940	0.008

For ITEM10 slope, B10

INTRCPT2, G100	-0.074897	0.158023	-0.474	29940	0.635
SEX, G101	0.508131	0.198751	2.557	29940	0.011

For ITEM11 slope, B11

INTRCPT2, G110	0.797432	0.171454	4.651	29940	0.000
SEX, G111	0.468371	0.211898	2.210	29940	0.027

For ITEM12 slope, B12

INTRCPT2, G120	-0.612248	0.155951	-3.926	29940	0.000
SEX, G121	0.924053	0.197157	4.687	29940	0.000

For ITEM13 slope, B13

INTRCPT2, G130	1.786044	0.208560	8.564	29940	0.000
SEX, G131	0.358859	0.250728	1.431	29940	0.152

For ITEM14 slope, B14

INTRCPT2, G140	0.140840	0.160088	0.880	29940	0.379
SEX, G141	0.966819	0.201958	4.787	29940	0.000

For ITEM15 slope, B15

INTRCPT2, G150	1.481991	0.193905	7.643	29940	0.000
SEX, G151	0.825150	0.241202	3.421	29940	0.001

For ITEM16 slope, B16

INTRCPT2, G160	0.114849	0.159799	0.719	29940	0.472
SEX, G161	0.497100	0.200275	2.482	29940	0.013

For ITEM17 slope, B17

INTRCPT2, G170	2.136488	0.230022	9.288	29940	0.000
SEX, G171	-0.015236	0.268546	-0.057	29940	0.955

For ITEM18 slope, B18

INTRCPT2, G180	-1.300393	0.159531	-8.151	29940	0.000
SEX, G181	0.732992	0.203534	3.601	29940	0.001

For ITEM19 slope, B19

INTRCPT2, G190	0.328588	0.162512	2.022	29940	0.043
SEX, G191	0.376977	0.202587	1.861	29940	0.062

For ITEM20 slope, B20

INTRCPT2, G200	-0.883118	0.156503	-5.643	29940	0.000
SEX, G201	0.718059	0.198781	3.612	29940	0.001

For ITEM21 slope, B21

INTRCPT2, G210	-0.353181	0.156420	-2.258	29940	0.024
----------------	-----------	----------	--------	-------	-------

SEX, G211	0.477705	0.197800	2.415	29940	0.016
-----------	----------	----------	-------	-------	-------

For ITEM22 slope, B22

INTRCPT2, G220	1.028832	0.177632	5.792	29940	0.000
----------------	----------	----------	-------	-------	-------

SEX, G221	0.302297	0.217313	1.391	29940	0.164
-----------	----------	----------	-------	-------	-------

For ITEM23 slope, B23

INTRCPT2, G230	-0.376909	0.156336	-2.411	29940	0.016
----------------	-----------	----------	--------	-------	-------

SEX, G231	0.486890	0.197766	2.462	29940	0.014
-----------	----------	----------	-------	-------	-------

For ITEM24 slope, B24

INTRCPT2, G240	-0.682612	0.155991	-4.376	29940	0.000
----------------	-----------	----------	--------	-------	-------

SEX, G241	1.023026	0.197168	5.189	29940	0.000
-----------	----------	----------	-------	-------	-------

For ITEM25 slope, B25

INTRCPT2, G250	0.574310	0.166648	3.446	29940	0.001
----------------	----------	----------	-------	-------	-------

SEX, G251	0.556654	0.207307	2.685	29940	0.008
-----------	----------	----------	-------	-------	-------

For ITEM26 slope, B26

INTRCPT2, G260	-1.957426	0.170540	-11.478	29940	0.000
----------------	-----------	----------	---------	-------	-------

SEX, G261	1.118755	0.214631	5.212	29940	0.000
-----------	----------	----------	-------	-------	-------

For ITEM27 slope, B27

INTRCPT2, G270	0.991344	0.176542	5.615	29940	0.000
----------------	----------	----------	-------	-------	-------

SEX, G271	0.234273	0.215814	1.086	29940	0.278
-----------	----------	----------	-------	-------	-------

For ITEM28 slope, B28

INTRCPT2, G280	-0.412408	0.156227	-2.640	29940	0.009
----------------	-----------	----------	--------	-------	-------

SEX, G281	0.609311	0.197513	3.085	29940	0.002
-----------	----------	----------	-------	-------	-------

For ITEM29 slope, B29

INTRCPT2, G290	-1.136989	0.158017	-7.195	29940	0.000
----------------	-----------	----------	--------	-------	-------

SEX, G291	0.776643	0.200953	3.865	29940	0.000
-----------	----------	----------	-------	-------	-------

Fixed Effect	Odds	Confidence	
	Coefficient	Ratio	Interval

For INTRCPT1, B0			
INTRCPT2, G00	0.587254	1.799042	(1.424,2.273)
SEX, G01	-1.033451	0.355777	(0.265,0.478)
For ITEM1 slope, B1			
INTRCPT2, G10	-0.764874	0.465393	(0.343,0.632)
SEX, G11	0.720359	2.055170	(1.394,3.030)
For ITEM2 slope, B2			
INTRCPT2, G20	0.012604	1.012684	(0.742,1.382)
SEX, G21	0.449173	1.567015	(1.060,2.316)
For ITEM3 slope, B3			
INTRCPT2, G30	1.432886	4.190776	(2.877,6.104)
SEX, G31	0.585644	1.796147	(1.133,2.849)
For ITEM4 slope, B4			
INTRCPT2, G40	0.715113	2.044417	(1.466,2.850)
SEX, G41	0.255278	1.290821	(0.857,1.944)
For ITEM5 slope, B5			
INTRCPT2, G50	1.166608	3.211082	(2.248,4.587)
SEX, G51	0.506352	1.659228	(1.071,2.571)
For ITEM6 slope, B6			
INTRCPT2, G60	-0.050064	0.951168	(0.698,1.297)
SEX, G61	0.461889	1.587070	(1.075,2.344)
For ITEM7 slope, B7			
INTRCPT2, G70	0.127822	1.136350	(0.831,1.555)
SEX, G71	0.643045	1.902264	(1.284,2.819)
For ITEM8 slope, B8			
INTRCPT2, G80	0.273808	1.314962	(0.958,1.805)

SEX, G81 0.841604 2.320086 (1.558,3.456)

For ITEM9 slope, B9

INTRCPT2, G90 0.715113 2.044417 (1.466,2.850)

SEX, G91 0.558785 1.748547 (1.158,2.641)

For ITEM10 slope, B10

INTRCPT2, G100 -0.074897 0.927839 (0.681,1.265)

SEX, G101 0.508131 1.662181 (1.126,2.454)

For ITEM11 slope, B11

INTRCPT2, G110 0.797432 2.219834 (1.586,3.106)

SEX, G111 0.468371 1.597390 (1.054,2.420)

For ITEM12 slope, B12

INTRCPT2, G120 -0.612248 0.542131 (0.399,0.736)

SEX, G121 0.924053 2.519480 (1.712,3.708)

For ITEM13 slope, B13

INTRCPT2, G130 1.786044 5.965802 (3.964,8.978)

SEX, G131 0.358859 1.431694 (0.876,2.340)

For ITEM14 slope, B14

INTRCPT2, G140 0.140840 1.151240 (0.841,1.576)

SEX, G141 0.966819 2.629567 (1.770,3.907)

For ITEM15 slope, B15

INTRCPT2, G150 1.481991 4.401703 (3.010,6.437)

SEX, G151 0.825150 2.282223 (1.422,3.662)

For ITEM16 slope, B16

INTRCPT2, G160 0.114849 1.121704 (0.820,1.534)

SEX, G161 0.497100 1.643947 (1.110,2.434)

For ITEM17 slope, B17

INTRCPT2, G170 2.136488 8.469644 (5.396,13.294)

SEX, G171 -0.015236 0.984880 (0.582,1.667)

For ITEM18 slope, B18

INTRCPT2, G180 -1.300393 0.272425 (0.199,0.372)

SEX, G181 0.732992 2.081298 (1.397,3.102)

For ITEM19 slope, B19

INTRCPT2, G190 0.328588 1.389005 (1.010,1.910)

SEX, G191 0.376977 1.457871 (0.980,2.169)

For ITEM20 slope, B20

INTRCPT2, G200 -0.883118 0.413492 (0.304,0.562)

SEX, G201 0.718059 2.050449 (1.389,3.027)

For ITEM21 slope, B21

INTRCPT2, G210 -0.353181 0.702450 (0.517,0.954)

SEX, G211 0.477705 1.612370 (1.094,2.376)

For ITEM22 slope, B22

INTRCPT2, G220 1.028832 2.797796 (1.975,3.963)

SEX, G221 0.302297 1.352962 (0.884,2.071)

For ITEM23 slope, B23

INTRCPT2, G230 -0.376909 0.685978 (0.505,0.932)

SEX, G231 0.486890 1.627247 (1.104,2.398)

For ITEM24 slope, B24

INTRCPT2, G240 -0.682612 0.505295 (0.372,0.686)

SEX, G241 1.023026 2.781598 (1.890,4.094)

For ITEM25 slope, B25

INTRCPT2, G250 0.574310 1.775904 (1.281,2.462)

SEX, G251 0.556654 1.744824 (1.162,2.619)

For ITEM26 slope, B26

INTRCPT2, G260 -1.957426 0.141221 (0.101,0.197)

SEX, G261 1.118755 3.061041 (2.010,4.662)

For ITEM27 slope, B27

INTRCPT2, G270 0.991344 2.694855 (1.907,3.809)

SEX, G271 0.234273 1.263989 (0.828,1.930)

For ITEM28 slope, B28

INTRCPT2, G280 -0.412408 0.662054 (0.487,0.899)

SEX, G281 0.609311 1.839164 (1.249,2.709)

For ITEM29 slope, B29

INTRCPT2, G290 -1.136989 0.320783 (0.235,0.437)

SEX, G291 0.776643 2.174160 (1.466,3.224)

The outcome variable is RESULT

Final estimation of fixed effects

(Unit-specific model with robust standard errors)

		Standard	Approx.			
Fixed Effect		Coefficient	Error	T-ratio	d.f.	P-value
For	INTRCPT1, B0					
	INTRCPT2, G00	0.587254	0.117598	4.994	998	0.000
	SEX, G01	-1.033451	0.148249	-6.971	998	0.000
For	ITEM1 slope, B1					
	INTRCPT2, G10	-0.764874	0.154153	-4.962	29940	0.000
	SEX, G11	0.720359	0.195401	3.687	29940	0.000
For	ITEM2 slope, B2					
	INTRCPT2, G20	0.012604	0.152815	0.082	29940	0.935
	SEX, G21	0.449173	0.195974	2.292	29940	0.022
For	ITEM3 slope, B3					
	INTRCPT2, G30	1.432886	0.181036	7.915	29940	0.000
	SEX, G31	0.585644	0.227574	2.573	29940	0.010

For ITEM4 slope, B4

INTRCPT2, G40	0.715113	0.169502	4.219	29940	0.000
SEX, G41	0.255278	0.207050	1.233	29940	0.218

For ITEM5 slope, B5

INTRCPT2, G50	1.166608	0.172204	6.775	29940	0.000
SEX, G51	0.506352	0.210113	2.410	29940	0.016

For ITEM6 slope, B6

INTRCPT2, G60	-0.050064	0.153259	-0.327	29940	0.744
SEX, G61	0.461889	0.198514	2.327	29940	0.020

For ITEM7 slope, B7

INTRCPT2, G70	0.127822	0.147846	0.865	29940	0.388
SEX, G71	0.643045	0.188904	3.404	29940	0.001

For ITEM8 slope, B8

INTRCPT2, G80	0.273808	0.158886	1.723	29940	0.084
SEX, G81	0.841604	0.203439	4.137	29940	0.000

For ITEM9 slope, B9

INTRCPT2, G90	0.715113	0.154390	4.632	29940	0.000
SEX, G91	0.558785	0.195414	2.859	29940	0.005

For ITEM10 slope, B10

INTRCPT2, G100	-0.074897	0.158872	-0.471	29940	0.637
SEX, G101	0.508131	0.200022	2.540	29940	0.011

For ITEM11 slope, B11

INTRCPT2, G110	0.797432	0.176004	4.531	29940	0.000
SEX, G111	0.468371	0.217314	2.155	29940	0.031

For ITEM12 slope, B12

INTRCPT2, G120	-0.612248	0.148607	-4.120	29940	0.000
SEX, G121	0.924053	0.192661	4.796	29940	0.000

For ITEM13 slope, B13

INTRCPT2, G130	1.786044	0.201371	8.869	29940	0.000
SEX, G131	0.358859	0.243594	1.473	29940	0.141

For ITEM14 slope, B14

INTRCPT2, G140	0.140840	0.160425	0.878	29940	0.380
SEX, G141	0.966819	0.201459	4.799	29940	0.000

For ITEM15 slope, B15

INTRCPT2, G150	1.481991	0.194141	7.634	29940	0.000
SEX, G151	0.825150	0.240859	3.426	29940	0.001

For ITEM16 slope, B16

INTRCPT2, G160	0.114849	0.159894	0.718	29940	0.472
SEX, G161	0.497100	0.199708	2.489	29940	0.013

For ITEM17 slope, B17

INTRCPT2, G170	2.136488	0.227938	9.373	29940	0.000
SEX, G171	-0.015236	0.265543	-0.057	29940	0.955

For ITEM18 slope, B18

INTRCPT2, G180	-1.300393	0.156570	-8.305	29940	0.000
SEX, G181	0.732992	0.202027	3.628	29940	0.001

For ITEM19 slope, B19

INTRCPT2, G190	0.328588	0.152233	2.158	29940	0.031
SEX, G191	0.376977	0.195375	1.930	29940	0.053

For ITEM20 slope, B20

INTRCPT2, G200	-0.883118	0.148134	-5.962	29940	0.000
SEX, G201	0.718059	0.189688	3.785	29940	0.000

For ITEM21 slope, B21

INTRCPT2, G210	-0.353181	0.146990	-2.403	29940	0.016
SEX, G211	0.477705	0.190953	2.502	29940	0.013

For ITEM22 slope, B22

INTRCPT2, G220 1.028832 0.176760 5.821 29940 0.000

SEX, G221 0.302297 0.215145 1.405 29940 0.160

For ITEM23 slope, B23

INTRCPT2, G230 -0.376909 0.156351 -2.411 29940 0.016

SEX, G231 0.486890 0.195051 2.496 29940 0.013

For ITEM24 slope, B24

INTRCPT2, G240 -0.682612 0.161270 -4.233 29940 0.000

SEX, G241 1.023026 0.201390 5.080 29940 0.000

For ITEM25 slope, B25

INTRCPT2, G250 0.574310 0.164160 3.498 29940 0.001

SEX, G251 0.556654 0.205251 2.712 29940 0.007

For ITEM26 slope, B26

INTRCPT2, G260 -1.957426 0.182957 -10.699 29940 0.000

SEX, G261 1.118755 0.228302 4.900 29940 0.000

For ITEM27 slope, B27

INTRCPT2, G270 0.991344 0.174865 5.669 29940 0.000

SEX, G271 0.234273 0.215340 1.088 29940 0.277

For ITEM28 slope, B28

INTRCPT2, G280 -0.412408 0.152511 -2.704 29940 0.007

SEX, G281 0.609311 0.192137 3.171 29940 0.002

For ITEM29 slope, B29

INTRCPT2, G290 -1.136989 0.164877 -6.896 29940 0.000

SEX, G291 0.776643 0.206674 3.758 29940 0.000

Fixed Effect	Odds	Confidence	
	Coefficient	Ratio	Interval

For INTRCPT1, B0			
INTRCPT2, G00	0.587254	1.799042	(1.429,2.265)
SEX, G01	-1.033451	0.355777	(0.266,0.476)
For ITEM1 slope, B1			
INTRCPT2, G10	-0.764874	0.465393	(0.344,0.630)
SEX, G11	0.720359	2.055170	(1.401,3.014)
For ITEM2 slope, B2			
INTRCPT2, G20	0.012604	1.012684	(0.751,1.366)
SEX, G21	0.449173	1.567015	(1.067,2.301)
For ITEM3 slope, B3			
INTRCPT2, G30	1.432886	4.190776	(2.939,5.976)
SEX, G31	0.585644	1.796147	(1.150,2.806)
For ITEM4 slope, B4			
INTRCPT2, G40	0.715113	2.044417	(1.467,2.850)
SEX, G41	0.255278	1.290821	(0.860,1.937)
For ITEM5 slope, B5			
INTRCPT2, G50	1.166608	3.211082	(2.291,4.500)
SEX, G51	0.506352	1.659228	(1.099,2.505)
For ITEM6 slope, B6			
INTRCPT2, G60	-0.050064	0.951168	(0.704,1.284)
SEX, G61	0.461889	1.587070	(1.076,2.342)
For ITEM7 slope, B7			
INTRCPT2, G70	0.127822	1.136350	(0.850,1.518)
SEX, G71	0.643045	1.902264	(1.314,2.755)
For ITEM8 slope, B8			
INTRCPT2, G80	0.273808	1.314962	(0.963,1.795)

SEX, G81 0.841604 2.320086 (1.557,3.457)

For ITEM9 slope, B9

INTRCPT2, G90 0.715113 2.044417 (1.511,2.767)

SEX, G91 0.558785 1.748547 (1.192,2.565)

For ITEM10 slope, B10

INTRCPT2, G100 -0.074897 0.927839 (0.680,1.267)

SEX, G101 0.508131 1.662181 (1.123,2.460)

For ITEM11 slope, B11

INTRCPT2, G110 0.797432 2.219834 (1.572,3.134)

SEX, G111 0.468371 1.597390 (1.043,2.446)

For ITEM12 slope, B12

INTRCPT2, G120 -0.612248 0.542131 (0.405,0.725)

SEX, G121 0.924053 2.519480 (1.727,3.675)

For ITEM13 slope, B13

INTRCPT2, G130 1.786044 5.965802 (4.020,8.853)

SEX, G131 0.358859 1.431694 (0.888,2.308)

For ITEM14 slope, B14

INTRCPT2, G140 0.140840 1.151240 (0.841,1.577)

SEX, G141 0.966819 2.629567 (1.772,3.903)

For ITEM15 slope, B15

INTRCPT2, G150 1.481991 4.401703 (3.009,6.440)

SEX, G151 0.825150 2.282223 (1.423,3.659)

For ITEM16 slope, B16

INTRCPT2, G160 0.114849 1.121704 (0.820,1.535)

SEX, G161 0.497100 1.643947 (1.111,2.432)

For ITEM17 slope, B17

INTRCPT2, G170 2.136488 8.469644 (5.418,13.240)

SEX, G171 -0.015236 0.984880 (0.585,1.657)

For ITEM18 slope, B18

INTRCPT2, G180 -1.300393 0.272425 (0.200,0.370)

SEX, G181 0.732992 2.081298 (1.401,3.092)

For ITEM19 slope, B19

INTRCPT2, G190 0.328588 1.389005 (1.031,1.872)

SEX, G191 0.376977 1.457871 (0.994,2.138)

For ITEM20 slope, B20

INTRCPT2, G200 -0.883118 0.413492 (0.309,0.553)

SEX, G201 0.718059 2.050449 (1.414,2.974)

For ITEM21 slope, B21

INTRCPT2, G210 -0.353181 0.702450 (0.527,0.937)

SEX, G211 0.477705 1.612370 (1.109,2.344)

For ITEM22 slope, B22

INTRCPT2, G220 1.028832 2.797796 (1.979,3.956)

SEX, G221 0.302297 1.352962 (0.887,2.063)

For ITEM23 slope, B23

INTRCPT2, G230 -0.376909 0.685978 (0.505,0.932)

SEX, G231 0.486890 1.627247 (1.110,2.385)

For ITEM24 slope, B24

INTRCPT2, G240 -0.682612 0.505295 (0.368,0.693)

SEX, G241 1.023026 2.781598 (1.874,4.128)

For ITEM25 slope, B25

INTRCPT2, G250 0.574310 1.775904 (1.287,2.450)

SEX, G251 0.556654 1.744824 (1.167,2.609)

For ITEM26 slope, B26

INTRCPT2, G260 -1.957426 0.141221 (0.099,0.202)

SEX, G261 1.118755 3.061041 (1.957,4.789)

For ITEM27 slope, B27

INTRCPT2, G270 0.991344 2.694855 (1.913,3.797)

SEX, G271 0.234273 1.263989 (0.829,1.928)

For ITEM28 slope, B28

INTRCPT2, G280	-0.412408	0.662054	(0.491,0.893)
SEX, G281	0.609311	1.839164	(1.262,2.680)

For ITEM29 slope, B29

INTRCPT2, G290	-1.136989	0.320783	(0.232,0.443)
SEX, G291	0.776643	2.174160	(1.450,3.260)

Final estimation of variance components:

Random Effect	Standard Deviation	Variance Component	df	Chi-square	P-value
INTRCPT1, U0	0.78055	0.60925	998	4287.44622	0.000

RESULTS FOR NON-LINEAR MODEL WITH THE LOGIT LINK FUNCTION:

Population Average Model

The value of the likelihood function at iteration 2 = -4.173792E+004

The outcome variable is RESULT

Final estimation of fixed effects: (Population-average model)

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

For INTRCPT1, B0

INTRCPT2, G00	0.537795	0.114017	4.717	998	0.000
SEX, G01	-0.937909	0.143756	-6.524	998	0.000

For ITEM1 slope, B1

INTRCPT2, G10	-0.691943	0.148537	-4.658	29940	0.000
SEX, G11	0.651693	0.188405	3.459	29940	0.001

For ITEM2 slope, B2

INTRCPT2, G20 0.011413 0.151003 0.076 29940 0.940

SEX, G21 0.404753 0.189502 2.136 29940 0.032

For ITEM3 slope, B3

INTRCPT2, G30 1.317145 0.183701 7.170 29940 0.000

SEX, G31 0.516063 0.225232 2.291 29940 0.022

For ITEM4 slope, B4

INTRCPT2, G40 0.651287 0.161755 4.026 29940 0.000

SEX, G41 0.223006 0.199109 1.120 29940 0.263

For ITEM5 slope, B5

INTRCPT2, G50 1.068414 0.174030 6.139 29940 0.000

SEX, G51 0.445351 0.213555 2.085 29940 0.037

For ITEM6 slope, B6

INTRCPT2, G60 -0.045320 0.150462 -0.301 29940 0.763

SEX, G61 0.416540 0.189074 2.203 29940 0.027

For ITEM7 slope, B7

INTRCPT2, G70 0.115820 0.152165 0.761 29940 0.447

SEX, G71 0.578534 0.190797 3.032 29940 0.003

For ITEM8 slope, B8

INTRCPT2, G80 0.248346 0.153957 1.613 29940 0.106

SEX, G81 0.757076 0.193452 3.914 29940 0.000

For ITEM9 slope, B9

INTRCPT2, G90 0.651287 0.161755 4.026 29940 0.000

SEX, G91 0.497880 0.200562 2.482 29940 0.013

For ITEM10 slope, B10

INTRCPT2, G100 -0.067793 0.150265 -0.451 29940 0.651

SEX, G101 0.458277 0.188914 2.426 29940 0.015

For ITEM11 slope, B11

INTRCPT2, G110 0.726934 0.163643 4.442 29940 0.000

SEX, G111 0.414880 0.202040 2.053 29940 0.040

For ITEM12 slope, B12

INTRCPT2, G120 -0.553710 0.148308 -3.734 29940 0.000

SEX, G121 0.834905 0.187424 4.455 29940 0.000

For ITEM13 slope, B13

INTRCPT2, G130 1.650228 0.199813 8.259 29940 0.000

SEX, G131 0.300745 0.240172 1.252 29940 0.211

For ITEM14 slope, B14

INTRCPT2, G140 0.127626 0.152310 0.838 29940 0.402

SEX, G141 0.870777 0.192106 4.533 29940 0.000

For ITEM15 slope, B15

INTRCPT2, G150 1.363243 0.185706 7.341 29940 0.000

SEX, G151 0.739678 0.231065 3.201 29940 0.002

For ITEM16 slope, B16

INTRCPT2, G160 0.104057 0.152023 0.684 29940 0.493

SEX, G161 0.447228 0.190410 2.349 29940 0.019

For ITEM17 slope, B17

INTRCPT2, G170 1.984132 0.220094 9.015 29940 0.000

SEX, G171 -0.055236 0.256994 -0.215 29940 0.830

For ITEM18 slope, B18

INTRCPT2, G180 -1.179642 0.152143 -7.753 29940 0.000

SEX, G181 0.663471 0.194210 3.416 29940 0.001

For ITEM19 slope, B19

INTRCPT2, G190 0.298158 0.154726 1.927 29940 0.054

SEX, G191 0.337388 0.192713 1.751 29940 0.080

For ITEM20 slope, B20

INTRCPT2, G200 -0.799217 0.148952 -5.366 29940 0.000

SEX, G201 0.649796 0.189219 3.434 29940 0.001

For ITEM21 slope, B21

Fixed Effect	Odds	Confidence	
	Coefficient	Ratio	Interval
For INTRCPT1, B0			
INTRCPT2, G00	0.537795	1.712226	(1.369,2.141)
SEX, G01	-0.937909	0.391445	(0.295,0.519)
For ITEM1 slope, B1			
INTRCPT2, G10	-0.691943	0.500602	(0.374,0.670)
SEX, G11	0.651693	1.918787	(1.326,2.776)
For ITEM2 slope, B2			
INTRCPT2, G20	0.011413	1.011479	(0.752,1.360)
SEX, G21	0.404753	1.498932	(1.034,2.173)
For ITEM3 slope, B3			
INTRCPT2, G30	1.317145	3.732749	(2.604,5.351)
SEX, G31	0.516063	1.675418	(1.077,2.605)
For ITEM4 slope, B4			
INTRCPT2, G40	0.651287	1.918008	(1.397,2.634)
SEX, G41	0.223006	1.249828	(0.846,1.846)
For ITEM5 slope, B5			
INTRCPT2, G50	1.068414	2.910758	(2.070,4.094)
SEX, G51	0.445351	1.561038	(1.027,2.372)
For ITEM6 slope, B6			
INTRCPT2, G60	-0.045320	0.955691	(0.712,1.283)
SEX, G61	0.416540	1.516705	(1.047,2.197)
For ITEM7 slope, B7			
INTRCPT2, G70	0.115820	1.122793	(0.833,1.513)
SEX, G71	0.578534	1.783423	(1.227,2.592)
For ITEM8 slope, B8			
INTRCPT2, G80	0.248346	1.281904	(0.948,1.733)

SEX, G81 0.757076 2.132033 (1.459,3.115)

For ITEM9 slope, B9

INTRCPT2, G90 0.651287 1.918008 (1.397,2.634)

SEX, G91 0.497880 1.645230 (1.110,2.438)

For ITEM10 slope, B10

INTRCPT2, G100 -0.067793 0.934454 (0.696,1.254)

SEX, G101 0.458277 1.581347 (1.092,2.290)

For ITEM11 slope, B11

INTRCPT2, G110 0.726934 2.068727 (1.501,2.851)

SEX, G111 0.414880 1.514189 (1.019,2.250)

For ITEM12 slope, B12

INTRCPT2, G120 -0.553710 0.574813 (0.430,0.769)

SEX, G121 0.834905 2.304594 (1.596,3.328)

For ITEM13 slope, B13

INTRCPT2, G130 1.650228 5.208170 (3.520,7.705)

SEX, G131 0.300745 1.350865 (0.844,2.163)

For ITEM14 slope, B14

INTRCPT2, G140 0.127626 1.136128 (0.843,1.531)

SEX, G141 0.870777 2.388766 (1.639,3.481)

For ITEM15 slope, B15

INTRCPT2, G150 1.363243 3.908849 (2.716,5.625)

SEX, G151 0.739678 2.095260 (1.332,3.296)

For ITEM16 slope, B16

INTRCPT2, G160 0.104057 1.109664 (0.824,1.495)

SEX, G161 0.447228 1.563970 (1.077,2.271)

For ITEM17 slope, B17

INTRCPT2, G170 1.984132 7.272729 (4.724,11.196)

SEX, G171 -0.055236 0.946262 (0.572,1.566)

For ITEM18 slope, B18

INTRCPT2, G180 -1.179642 0.307389 (0.228,0.414)

SEX, G181 0.663471 1.941520 (1.327,2.841)

For ITEM19 slope, B19

INTRCPT2, G190 0.298158 1.347375 (0.995,1.825)

SEX, G191 0.337388 1.401282 (0.960,2.044)

For ITEM20 slope, B20

INTRCPT2, G200 -0.799217 0.449681 (0.336,0.602)

SEX, G201 0.649796 1.915150 (1.322,2.775)

For ITEM21 slope, B21

INTRCPT2, G210 -0.319426 0.726566 (0.543,0.972)

SEX, G211 0.431860 1.540120 (1.065,2.226)

For ITEM22 slope, B22

INTRCPT2, G220 0.940529 2.561336 (1.836,3.573)

SEX, G221 0.260679 1.297811 (0.864,1.949)

For ITEM23 slope, B23

INTRCPT2, G230 -0.340876 0.711147 (0.531,0.952)

SEX, G231 0.440189 1.553001 (1.074,2.245)

For ITEM24 slope, B24

INTRCPT2, G240 -0.617411 0.539339 (0.403,0.721)

SEX, G241 0.924361 2.520257 (1.745,3.639)

For ITEM25 slope, B25

INTRCPT2, G250 0.522279 1.685866 (1.235,2.302)

SEX, G251 0.497226 1.644154 (1.117,2.421)

For ITEM26 slope, B26

INTRCPT2, G260 -1.787146 0.167437 (0.122,0.231)

SEX, G261 1.021158 2.776409 (1.856,4.153)

For ITEM27 slope, B27

INTRCPT2, G270 0.905826 2.473975 (1.777,3.443)

SEX, G271 0.199497 1.220788 (0.815,1.828)

For ITEM28 slope, B28

INTRCPT2, G280	-0.372968	0.688688	(0.515,0.921)
SEX, G281	0.550662	1.734401	(1.200,2.506)

For ITEM29 slope, B29

INTRCPT2, G290	-1.030265	0.356912	(0.266,0.479)
SEX, G291	0.703337	2.020484	(1.388,2.941)

The outcome variable is RESULT

Final estimation of fixed effects

(Population-average model with robust standard errors)

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

For INTRCPT1, B0

INTRCPT2, G00	0.537795	0.106638	5.043	998	0.000
SEX, G01	-0.937909	0.134413	-6.978	998	0.000

For ITEM1 slope, B1

INTRCPT2, G10	-0.691943	0.139958	-4.944	29940	0.000
SEX, G11	0.651693	0.177215	3.677	29940	0.000

For ITEM2 slope, B2

INTRCPT2, G20	0.011413	0.138228	0.083	29940	0.935
SEX, G21	0.404753	0.177100	2.285	29940	0.022

For ITEM3 slope, B3

INTRCPT2, G30	1.317145	0.166508	7.910	29940	0.000
SEX, G31	0.516063	0.209385	2.465	29940	0.014

For ITEM4 slope, B4

INTRCPT2, G40	0.651287	0.154608	4.212	29940	0.000
SEX, G41	0.223006	0.188401	1.184	29940	0.237

For ITEM5 slope, B5

INTRCPT2, G50 1.068414 0.158285 6.750 29940 0.000

SEX, G51 0.445351 0.193112 2.306 29940 0.021

For ITEM6 slope, B6

INTRCPT2, G60 -0.045320 0.138611 -0.327 29940 0.743

SEX, G61 0.416540 0.179376 2.322 29940 0.020

For ITEM7 slope, B7

INTRCPT2, G70 0.115820 0.133862 0.865 29940 0.387

SEX, G71 0.578534 0.170823 3.387 29940 0.001

For ITEM8 slope, B8

INTRCPT2, G80 0.248346 0.143983 1.725 29940 0.084

SEX, G81 0.757076 0.184305 4.108 29940 0.000

For ITEM9 slope, B9

INTRCPT2, G90 0.651287 0.140945 4.621 29940 0.000

SEX, G91 0.497880 0.178176 2.794 29940 0.006

For ITEM10 slope, B10

INTRCPT2, G100 -0.067793 0.143647 -0.472 29940 0.637

SEX, G101 0.458277 0.180744 2.536 29940 0.012

For ITEM11 slope, B11

INTRCPT2, G110 0.726934 0.160849 4.519 29940 0.000

SEX, G111 0.414880 0.198177 2.093 29940 0.036

For ITEM12 slope, B12

INTRCPT2, G120 -0.553710 0.134651 -4.112 29940 0.000

SEX, G121 0.834905 0.174280 4.791 29940 0.000

For ITEM13 slope, B13

INTRCPT2, G130 1.650228 0.186185 8.863 29940 0.000

SEX, G131 0.300745 0.225363 1.334 29940 0.182

For ITEM14 slope, B14

INTRCPT2, G140 0.127626 0.145163 0.879 29940 0.380

SEX, G141 0.870777 0.182536 4.770 29940 0.000

For ITEM15 slope, B15

INTRCPT2, G150 1.363243 0.179044 7.614 29940 0.000

SEX, G151 0.739678 0.223171 3.314 29940 0.001

For ITEM16 slope, B16

INTRCPT2, G160 0.104057 0.144675 0.719 29940 0.472

SEX, G161 0.447228 0.180459 2.478 29940 0.013

For ITEM17 slope, B17

INTRCPT2, G170 1.984132 0.211445 9.384 29940 0.000

SEX, G171 -0.055236 0.246447 -0.224 29940 0.823

For ITEM18 slope, B18

INTRCPT2, G180 -1.179642 0.143173 -8.239 29940 0.000

SEX, G181 0.663471 0.184616 3.594 29940 0.001

For ITEM19 slope, B19

INTRCPT2, G190 0.298158 0.138055 2.160 29940 0.031

SEX, G191 0.337388 0.176851 1.908 29940 0.056

For ITEM20 slope, B20

INTRCPT2, G200 -0.799217 0.134667 -5.935 29940 0.000

SEX, G201 0.649796 0.172292 3.771 29940 0.000

For ITEM21 slope, B21

INTRCPT2, G210 -0.319426 0.132981 -2.402 29940 0.016

SEX, G211 0.431860 0.172668 2.501 29940 0.013

For ITEM22 slope, B22

INTRCPT2, G220 0.940529 0.162008 5.805 29940 0.000

SEX, G221 0.260679 0.196755 1.325 29940 0.185

For ITEM23 slope, B23

INTRCPT2, G230 -0.340876 0.141579 -2.408 29940 0.016

SEX, G231 0.440189 0.176489 2.494 29940 0.013

For ITEM24 slope, B24

INTRCPT2, G240 -0.617411 0.146092 -4.226 29940 0.000

SEX, G241 0.924361 0.182206 5.073 29940 0.000

For ITEM25 slope, B25

INTRCPT2, G250 0.522279 0.149266 3.499 29940 0.001

SEX, G251 0.497226 0.186470 2.667 29940 0.008

For ITEM26 slope, B26

INTRCPT2, G260 -1.787146 0.168433 -10.610 29940 0.000

SEX, G261 1.021158 0.209734 4.869 29940 0.000

For ITEM27 slope, B27

INTRCPT2, G270 0.905826 0.159540 5.678 29940 0.000

SEX, G271 0.199497 0.196157 1.017 29940 0.310

For ITEM28 slope, B28

INTRCPT2, G280 -0.372968 0.138110 -2.701 29940 0.007

SEX, G281 0.550662 0.173786 3.169 29940 0.002

For ITEM29 slope, B29

INTRCPT2, G290 -1.030265 0.149971 -6.870 29940 0.000

SEX, G291 0.703337 0.187872 3.744 29940 0.000

	Odds	Confidence
Fixed Effect	Coefficient	Ratio Interval

For INTRCPT1, B0

INTRCPT2, G00 0.537795 1.712226 (1.389,2.110)

SEX, G01 -0.937909 0.391445 (0.301,0.509)

For ITEM1 slope, B1

INTRCPT2, G10 -0.691943 0.500602 (0.381,0.659)

SEX, G11 0.651693 1.918787 (1.356,2.716)

For ITEM2 slope, B2

INTRCPT2, G20 0.011413 1.011479 (0.771,1.326)

SEX, G21 0.404753 1.498932 (1.059,2.121)

For ITEM3 slope, B3

INTRCPT2, G30 1.317145 3.732749 (2.693,5.173)

SEX, G31 0.516063 1.675418 (1.111,2.526)

For ITEM4 slope, B4

INTRCPT2, G40 0.651287 1.918008 (1.417,2.597)

SEX, G41 0.223006 1.249828 (0.864,1.808)

For ITEM5 slope, B5

INTRCPT2, G50 1.068414 2.910758 (2.134,3.970)

SEX, G51 0.445351 1.561038 (1.069,2.279)

For ITEM6 slope, B6

INTRCPT2, G60 -0.045320 0.955691 (0.728,1.254)

SEX, G61 0.416540 1.516705 (1.067,2.156)

For ITEM7 slope, B7

INTRCPT2, G70 0.115820 1.122793 (0.864,1.460)

SEX, G71 0.578534 1.783423 (1.276,2.493)

For ITEM8 slope, B8

INTRCPT2, G80 0.248346 1.281904 (0.967,1.700)

SEX, G81 0.757076 2.132033 (1.486,3.060)

For ITEM9 slope, B9

INTRCPT2, G90 0.651287 1.918008 (1.455,2.528)

SEX, G91 0.497880 1.645230 (1.160,2.333)

For ITEM10 slope, B10

INTRCPT2, G100 -0.067793 0.934454 (0.705,1.238)

SEX, G101 0.458277 1.581347 (1.110,2.254)

For ITEM11 slope, B11

INTRCPT2, G110 0.726934 2.068727 (1.509,2.835)

SEX, G111 0.414880 1.514189 (1.027,2.233)

For ITEM12 slope, B12

INTRCPT2, G120 -0.553710 0.574813 (0.441,0.748)

SEX, G121 0.834905 2.304594 (1.638,3.243)

For ITEM13 slope, B13

INTRCPT2, G130 1.650228 5.208170 (3.616,7.502)

SEX, G131 0.300745 1.350865 (0.869,2.101)

For ITEM14 slope, B14

INTRCPT2, G140 0.127626 1.136128 (0.855,1.510)

SEX, G141 0.870777 2.388766 (1.670,3.416)

For ITEM15 slope, B15

INTRCPT2, G150 1.363243 3.908849 (2.752,5.552)

SEX, G151 0.739678 2.095260 (1.353,3.245)

For ITEM16 slope, B16

INTRCPT2, G160 0.104057 1.109664 (0.836,1.473)

SEX, G161 0.447228 1.563970 (1.098,2.228)

For ITEM17 slope, B17

INTRCPT2, G170 1.984132 7.272729 (4.805,11.007)

SEX, G171 -0.055236 0.946262 (0.584,1.534)

For ITEM18 slope, B18

INTRCPT2, G180 -1.179642 0.307389 (0.232,0.407)

SEX, G181 0.663471 1.941520 (1.352,2.788)

For ITEM19 slope, B19

INTRCPT2, G190 0.298158 1.347375 (1.028,1.766)

SEX, G191 0.337388 1.401282 (0.991,1.982)

For ITEM20 slope, B20

INTRCPT2, G200 -0.799217 0.449681 (0.345,0.586)

SEX, G201 0.649796 1.915150 (1.366,2.684)

For ITEM21 slope, B21

INTRCPT2, G210 -0.319426 0.726566 (0.560,0.943)

SEX, G211 0.431860 1.540120 (1.098,2.160)

For ITEM22 slope, B22

INTRCPT2, G220 0.940529 2.561336 (1.865,3.519)

SEX, G221 0.260679 1.297811 (0.883,1.909)

For ITEM23 slope, B23

INTRCPT2, G230 -0.340876 0.711147 (0.539,0.939)

SEX, G231 0.440189 1.553001 (1.099,2.195)

For ITEM24 slope, B24

INTRCPT2, G240 -0.617411 0.539339 (0.405,0.718)

SEX, G241 0.924361 2.520257 (1.763,3.602)

For ITEM25 slope, B25

INTRCPT2, G250 0.522279 1.685866 (1.258,2.259)

SEX, G251 0.497226 1.644154 (1.141,2.370)

For ITEM26 slope, B26

INTRCPT2, G260 -1.787146 0.167437 (0.120,0.233)

SEX, G261 1.021158 2.776409 (1.841,4.188)

For ITEM27 slope, B27

INTRCPT2, G270 0.905826 2.473975 (1.810,3.382)

SEX, G271 0.199497 1.220788 (0.831,1.793)

For ITEM28 slope, B28

INTRCPT2, G280 -0.372968 0.688688 (0.525,0.903)

SEX, G281 0.550662 1.734401 (1.234,2.438)

For ITEM29 slope, B29

INTRCPT2, G290 -1.030265 0.356912 (0.266,0.479)

SEX, G291 0.703337 2.020484 (1.398,2.920)

ภาคผนวก ข

ตัวอย่าง Print Out การวิเคราะห์การทำหน้าที่ต่างกันของข้อสอบ (DIF)

จากโปรแกรม Mplus ด้วยวิธี MIMIC

Mplus VERSION 6.12

MUTHEN & MUTHEN

10/25/2012 2:17 PM

INPUT INSTRUCTIONS

Title:

Confrim Factor Analysis With Mplus

Data:

File is datatest.dat;

Variable:

Names are ARE SEX s01 s02 s03 s04 s05 s06 s07

s08 s09 s10 s11 s12 s13 s14 s15 s16 s17 s18 s19 s20

s21 s22 s23 s24 s25 s26 s27 s28 s29 s30 s31 s32 s33 s34

s35 s36 s37 s38 s39 s40 s41 s42 s43 s44 s45 s46 s47 s48

s49 s50 s51 s52 s53 s54 s55 s56 s57 s58 s59 s60 s61 s62

s63 s64 s65 s66 s67 s68 s69 s70 s71 s72 s73 s74 s75 s76

s77 s78 s79 s80 s81 s82 s83 s84 s85 s86 s87 s88 s89 s90;

Usevariables are SEX s01 - s30;

categorical are s01-s30;

MODEL RESULTS

		Two-Tailed		
		Estimate	S.E.	Est./S.E. P-Value
F1	BY			
	S01	1.000	0.000	999.000 999.000
	S02	1.369	0.198	6.928 0.000
	S03	1.387	0.202	6.880 0.000
	S04	1.875	0.233	8.054 0.000
	S05	1.928	0.250	7.709 0.000
	S06	1.179	0.169	6.959 0.000

S07	1.471	0.203	7.264	0.000
S08	1.164	0.179	6.488	0.000
S09	1.660	0.222	7.462	0.000
S10	1.101	0.176	6.260	0.000
S11	1.268	0.189	6.701	0.000
S12	1.379	0.185	7.442	0.000
S13	1.451	0.220	6.595	0.000
S14	0.741	0.154	4.798	0.000
S15	1.758	0.240	7.312	0.000
S16	0.999	0.158	6.317	0.000
S17	1.813	0.244	7.444	0.000
S18	0.803	0.160	5.025	0.000
S19	1.499	0.199	7.545	0.000
S20	1.388	0.197	7.056	0.000
S21	1.291	0.184	7.001	0.000
S22	1.357	0.197	6.882	0.000
S23	1.446	0.199	7.251	0.000
S24	1.416	0.188	7.545	0.000
S25	1.414	0.205	6.905	0.000
S26	-0.223	0.138	-1.616	0.106
S27	0.899	0.163	5.531	0.000
S28	1.452	0.193	7.528	0.000
S29	0.370	0.127	2.924	0.003
S30	1.107	0.172	6.437	0.000
F1	ON			
SEX	-0.197	0.034	-5.728	0.000
S30	ON			
SEX	-0.367	0.082	-4.461	0.000

S24	ON				
SEX		0.270	0.080	3.396	0.001
S01	ON				
SEX		0.000	0.000	999.000	999.000
S02	ON				
SEX		0.000	0.000	999.000	999.000
S03	ON				
SEX		0.000	0.000	999.000	999.000
S04	ON				
SEX		0.000	0.000	999.000	999.000
S05	ON				
SEX		0.000	0.000	999.000	999.000
S06	ON				
SEX		0.000	0.000	999.000	999.000
S07	ON				
SEX		0.000	0.000	999.000	999.000
S08	ON				
SEX		0.000	0.000	999.000	999.000
S09	ON				
SEX		0.000	0.000	999.000	999.000
S10	ON				
SEX		0.000	0.000	999.000	999.000
S11	ON				
SEX		0.000	0.000	999.000	999.000
S12	ON				
SEX		0.000	0.000	999.000	999.000
S13	ON				
SEX		0.000	0.000	999.000	999.000

S14	ON				
SEX		0.000	0.000	999.000	999.000
S15	ON				
SEX		0.000	0.000	999.000	999.000
S16	ON				
SEX		0.000	0.000	999.000	999.000
S17	ON				
SEX		0.000	0.000	999.000	999.000
S18	ON				
SEX		0.000	0.000	999.000	999.000
S19	ON				
SEX		0.000	0.000	999.000	999.000
S20	ON				
SEX		0.000	0.000	999.000	999.000
S21	ON				
SEX		0.000	0.000	999.000	999.000
S22	ON				
SEX		0.000	0.000	999.000	999.000
S23	ON				
SEX		0.000	0.000	999.000	999.000
S25	ON				
SEX		0.000	0.000	999.000	999.000
S26	ON				
SEX		0.000	0.000	999.000	999.000
S27	ON				
SEX		0.000	0.000	999.000	999.000
S28	ON				
SEX		0.000	0.000	999.000	999.000

S29 ON

SEX	0.000	0.000	999.000	999.000
-----	-------	-------	---------	---------

S03 WITH

S02	0.176	0.049	3.563	0.000
-----	-------	-------	-------	-------

S23 WITH

S12	0.154	0.042	3.692	0.000
-----	-------	-------	-------	-------

Thresholds

S01\$1	0.097	0.065	1.493	0.135
S02\$1	-0.342	0.066	-5.191	0.000
S03\$1	-1.102	0.081	-13.599	0.000
S04\$1	-0.728	0.071	-10.225	0.000
S05\$1	-0.966	0.077	-12.578	0.000
S06\$1	-0.307	0.066	-4.679	0.000
S07\$1	-0.407	0.067	-6.111	0.000
S08\$1	-0.487	0.067	-7.229	0.000
S09\$1	-0.728	0.071	-10.225	0.000
S10\$1	-0.293	0.066	-4.474	0.000
S11\$1	-0.772	0.072	-10.711	0.000
S12\$1	0.010	0.065	0.154	0.877
S13\$1	-1.277	0.088	-14.539	0.000
S14\$1	-0.414	0.067	-6.213	0.000
S15\$1	-1.126	0.082	-13.757	0.000
S16\$1	-0.399	0.066	-6.009	0.000
S17\$1	-1.445	0.096	-15.031	0.000
S18\$1	0.399	0.066	6.009	0.000
S19\$1	-0.517	0.068	-7.633	0.000
S20\$1	0.164	0.065	2.523	0.012
S21\$1	-0.137	0.065	-2.112	0.035

S22\$1	-0.894	0.075	-11.941	0.000
S23\$1	-0.123	0.065	-1.905	0.057
S24\$1	0.050	0.065	0.773	0.440
S25\$1	-0.652	0.070	-9.337	0.000
S26\$1	0.763	0.072	10.613	0.000
S27\$1	-0.874	0.074	-11.755	0.000
S28\$1	-0.103	0.065	-1.597	0.110
S29\$1	0.307	0.066	4.680	0.000
S30\$1	-0.335	0.066	-5.089	0.000

Residual Variances

F1	0.124	0.029	4.243	0.000
----	-------	-------	-------	-------

STANDARDIZED MODEL RESULTS

F1	BY	StdYX	Std
		Estimate	Estimate
	S01	0.363	0.365
	S02	0.495	0.499
	S03	0.501	0.506
	S04	0.673	0.684
	S05	0.691	0.703
	S06	0.427	0.430
	S07	0.531	0.536
	S08	0.422	0.424
	S09	0.598	0.605
	S10	0.399	0.401
	S11	0.459	0.462
	S12	0.499	0.503

S13	0.524	0.529
S14	0.269	0.270
S15	0.632	0.641
S16	0.363	0.364
S17	0.651	0.661
S18	0.292	0.293
S19	0.541	0.546
S20	0.502	0.506
S21	0.467	0.471
S22	0.491	0.495
S23	0.522	0.527
S24	0.516	0.516
S25	0.511	0.516
S26	-0.081	-0.081
S27	0.327	0.328
S28	0.524	0.529
S29	0.135	0.135
S30	0.388	0.403
F1	ON	
SEX		-0.262 -0.540
S30	ON	
SEX		-0.171 -0.367
S24	ON	
SEX		0.131 0.270
S01	ON	
SEX		0.000 0.000
S02	ON	
SEX		0.000 0.000

S03	ON		
SEX		0.000	0.000
S04	ON		
SEX		0.000	0.000
S05	ON		
SEX		0.000	0.000
S06	ON		
SEX		0.000	0.000
S07	ON		
SEX		0.000	0.000
S08	ON		
SEX		0.000	0.000
S09	ON		
SEX		0.000	0.000
S10	ON		
SEX		0.000	0.000
S11	ON		
SEX		0.000	0.000
S12	ON		
SEX		0.000	0.000
S13	ON		
SEX		0.000	0.000
S14	ON		
SEX		0.000	0.000
S15	ON		
SEX		0.000	0.000
S16	ON		
SEX		0.000	0.000

S17	ON		
SEX		0.000	0.000
S18	ON		
SEX		0.000	0.000
S19	ON		
SEX		0.000	0.000
S20	ON		
SEX		0.000	0.000
S21	ON		
SEX		0.000	0.000
S22	ON		
SEX		0.000	0.000
S23	ON		
SEX		0.000	0.000
S25	ON		
SEX		0.000	0.000
S26	ON		
SEX		0.000	0.000
S27	ON		
SEX		0.000	0.000
S28	ON		
SEX		0.000	0.000
S29	ON		
SEX		0.000	0.000
S03	WITH		
S02		0.176	0.176
S23	WITH		
S12		0.154	0.154

Thresholds

S01\$1	0.096	0.097
S02\$1	-0.339	-0.342
S03\$1	-1.092	-1.102
S04\$1	-0.716	-0.728
S05\$1	-0.950	-0.966
S06\$1	-0.305	-0.307
S07\$1	-0.403	-0.407
S08\$1	-0.484	-0.487
S09\$1	-0.719	-0.728
S10\$1	-0.292	-0.293
S11\$1	-0.766	-0.772
S12\$1	0.010	0.010
S13\$1	-1.265	-1.277
S14\$1	-0.413	-0.414
S15\$1	-1.111	-1.126
S16\$1	-0.397	-0.399
S17\$1	-1.424	-1.445
S18\$1	0.398	0.399
S19\$1	-0.512	-0.517
S20\$1	0.162	0.164
S21\$1	-0.136	-0.137
S22\$1	-0.886	-0.894
S23\$1	-0.122	-0.123
S24\$1	0.050	0.050
S25\$1	-0.646	-0.652
S26\$1	0.762	0.763
S27\$1	-0.871	-0.874
S28\$1	-0.102	-0.103

S29\$1	0.307	0.307
S30\$1	-0.323	-0.335

Residual Variances

F1	0.931	0.931
----	-------	-------

R-SQUARE

Observed Variable	Estimate	Residual Variance
S01	0.132	0.876
S02	0.245	0.768
S03	0.251	0.762
S04	0.453	0.565
S05	0.478	0.540
S06	0.182	0.828
S07	0.282	0.732
S08	0.178	0.832
S09	0.357	0.659
S10	0.159	0.850
S11	0.211	0.801
S12	0.249	0.764
S13	0.274	0.739
S14	0.073	0.932
S15	0.400	0.617
S16	0.132	0.876
S17	0.424	0.593
S18	0.085	0.920
S19	0.293	0.722
S20	0.252	0.762
S21	0.218	0.794

S22	0.241	0.772
S23	0.273	0.741
S24	0.248	0.752
S25	0.261	0.752
S26	0.007	0.994
S27	0.107	0.900
S28	0.275	0.739
S29	0.018	0.983
S30	0.215	0.848

Latent

Variable	Estimate
----------	----------

F1	0.069
----	-------

Beginning Time: 14:17:44

Ending Time: 14:18:01

Elapsed Time: 00:00:17

MUTHEN & MUTHEN

3463 Stoner Ave.

Los Angeles, CA 90066

Tel: (310) 391-9971

Fax: (310) 391-8971

Web: www.StatModel.com

Support: Support@StatModel.com

Copyright (c) 1998-2011 Muthen & Muthen

มหาวิทยาลัยบูรพา
Burapha University

ภาคผนวก ข

ตัวอย่าง Print Out การวิเคราะห์การทำหน้าที่ต่างกันของข้อสอบ (DIF)

จากโปรแกรม Winbugs ด้วยวิธี BAYESIAN

Syntax for an IRT-based DIF Model with a Bayesian
Estimation by WinBUGS

```

model
{
  mu.Beta1<-mean(Beta1[])
  mu.z<-mean(z[])
  sd.z<-sd(z[])
  for (i in 1:n){
    b[i]~dnorm(0,1)
    Beta1[i]~dnorm(0,1)
    adj.Beta1[i]<-(Beta1[i]-mu.Beta1)
  }
  a~dnorm(0,1)
  Beta~dnorm(muBeta,sigBeta)
  muBeta~dnorm(0,.0001)
  muBeta1~dnorm(0,0001)
  sigBeta~dchisqr(.5)
  sigBeta1~dchisqr(.5)
  for (j in 1:N){
    for (i in 1:n){
      p[j,i]<- 1/(1+exp(-(a*(Beta*Group[j]+z[j]-b[i]-Beta1[i]*Group[j]))))
      U[j,i]~dbern(p[j,i])
    }
    z[j] ~ dnorm(0,1)
  }
  adj.Beta<-(Beta-mu.Beta1)

```