

มหาวิทยาลัยบูรพา
Burapha University

ภาคผนวก

ภาคผนวก ก

ผลการวิเคราะห์ค่าความยากง่ายและค่าอำนาจจำแนกของข้อสอบด้วยโปรแกรม BILOG MG3.0

BILOG-MG V3.0
REV 19990104.1300

BILOG-MG ITEM MAINTENANCE PROGRAM: LOGISTIC ITEM RESPONSE MODEL

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*** BILOG-MG ITEM MAINTENANCE PROGRAM ***

*** PHASE 1 ***

NTtest2551 Bilog Analysis of m3subj_thai.dat
>COMMENT This is the same data set analyzed in the R templates

>GLOBAL DFName = 'm3subj_thai.dat',

NPArm = 3;

ITEM STATISTICS FOR SUBTEST TEST1

ITEM	NAME	#TRIED	#RIGHT	PCT	ITEM*TEST CORRELATION		
					LOGIT/1.7	PEARSON	BISERIAL
1	ITEM0001	5011.0	1480.0	29.5	0.51	-0.054	-0.072
2	ITEM0002	5011.0	3776.0	75.4	-0.66	0.154	0.211
3	ITEM0003	5011.0	1796.0	35.8	0.34	0.128	0.164
4	ITEM0004	5011.0	187.0	3.7	1.91	-0.042	-0.097
5	ITEM0005	5011.0	1003.0	20.0	0.81	-0.034	-0.049
6	ITEM0006	5011.0	1826.0	36.4	0.33	0.162	0.208
7	ITEM0007	5011.0	1370.0	27.3	0.57	0.107	0.144
8	ITEM0008	5011.0	1155.0	23.0	0.71	0.185	0.257
9	ITEM0009	5011.0	2274.0	45.4	0.11	0.254	0.319
10	ITEM0010	5011.0	1609.0	32.1	0.44	0.037	0.048
11	ITEM0011	5011.0	2324.0	46.4	0.09	0.232	0.291
12	ITEM0012	5011.0	1589.0	31.7	0.45	0.179	0.234
13	ITEM0013	5011.0	77.0	1.5	2.45	-0.026	-0.081
14	ITEM0014	5011.0	706.0	14.1	1.06	0.005	0.008
15	ITEM0015	5011.0	3056.0	61.0	-0.26	0.313	0.398
16	ITEM0016	5011.0	2610.0	52.1	-0.05	0.214	0.268
17	ITEM0017	5011.0	1949.0	38.9	0.27	0.204	0.259
18	ITEM0018	5011.0	383.0	7.6	1.47	0.020	0.036
19	ITEM0019	5011.0	1558.0	31.1	0.47	0.118	0.155
20	ITEM0020	5011.0	483.0	9.6	1.32	0.019	0.033
21	ITEM0021	5011.0	2263.0	45.2	0.11	0.160	0.201
22	ITEM0022	5011.0	1965.0	39.2	0.26	0.199	0.253
23	ITEM0023	5011.0	1757.0	35.1	0.36	0.142	0.183
24	ITEM0024	5011.0	455.0	9.1	1.36	0.031	0.055
25	ITEM0025	5011.0	1921.0	38.3	0.28	0.212	0.270
26	ITEM0026	5011.0	541.0	10.8	1.24	0.019	0.032

27	ITEM0027	5011.0	2194.0	43.8	0.15	0.220	0.277
28	ITEM0028	5011.0	1695.0	33.8	0.39	0.179	0.231
29	ITEM0029	5011.0	1773.0	35.4	0.35	0.206	0.265
30	ITEM0030	5011.0	543.0	10.8	1.24	0.019	0.032
31	ITEM0031	5011.0	2731.0	54.5	-0.11	0.248	0.312
32	ITEM0032	5011.0	2311.0	46.1	0.09	0.263	0.330
33	ITEM0033	5011.0	2460.0	49.1	0.02	0.225	0.282
34	ITEM0034	5011.0	1868.0	37.3	0.31	0.188	0.240
35	ITEM0035	5011.0	2323.0	46.4	0.09	0.247	0.311
36	ITEM0036	5011.0	412.0	8.2	1.42	-0.012	-0.021
37	ITEM0037	5011.0	2158.0	43.1	0.16	0.123	0.154
38	ITEM0038	5011.0	2636.0	52.6	-0.06	0.268	0.336
39	ITEM0039	5011.0	1859.0	37.1	0.31	0.147	0.189
40	ITEM0040	5011.0	0.0	0.0	99.99	0.000	0.000

536 BYTES OF NUMERICAL WORKSPACE USED OF 8192000 AVAILABLE IN PHASE-1

4204 BYTES OF CHARACTER WORKSPACE USED OF 2048000 AVAILABLE IN PHASE-1

08/27/2009 13:00:32

BILOG-MG V3.0
REV 19990329.1300

BILOG-MG ITEM MAINTENANCE PROGRAM: LOGISTIC ITEM RESPONSE MODEL

*** BILOG-MG ITEM MAINTENANCE PROGRAM ***

*** PHASE 2 ***

NTtest2551 Bilog Analysis of m3subj.thai.dat
>COMMENT This is the same data set analyzed in the R templates

>CALIB NQPt = 40,

CYCLES = 40,
NEWTON = 5,
CRIT = 0.0010,
ACCEL = 1.0000,
TPrior,
GPrior;

CALIBRATION PARAMETERS

=====

MAXIMUM NUMBER OF EM CYCLES:	40
MAXIMUM NUMBER OF NEWTON CYCLES:	5
CONVERGENCE CRITERION:	0.0010
ACCELERATION CONSTANT:	1.0000

LATENT DISTRIBUTION:	NORMAL PRIOR FOR EACH GROUP
PLOT EMPIRICAL VS. FITTED ICC'S:	NO
DATA HANDLING:	DATA ON SCRATCH FILE
CONSTRAINT DISTRIBUTION ON ASYMPTOTES:	YES
CONSTRAINT DISTRIBUTION ON SLOPES:	YES
CONSTRAINT DISTRIBUTION ON THRESHOLDS:	YES
SOURCE OF ITEM CONSTRAINT DISTRIBUTION	
MEANS AND STANDARD DEVIATIONS:	PROGRAM DEFAULTS

INTERVAL COUNTS FOR COMPUTATION OF ITEM CHI-SQUARES

18. 362. 579. 542. 721. 892. 834. 619. 444.

INTERVAL AVERAGE THETAS

 -2.036 -1.729 -1.295 -0.809 -0.312 0.148 0.625 1.089 1.685

SUBTEST TEST1 ; ITEM PARAMETERS AFTER CYCLE 26

ITEM	INTERCEPT S.E.	SLOPE S.E.	THRESHOLD S.E.	LOADING S.E.	ASYMPTOTE S.E.	CHISQ (PROB)	DF
ITEM0001	-0.365 0.015*	0.013 0.003*	27.381 6.032*	0.013 0.003*	0.005 0.002*	1066.4 (0.0000)	9.0
ITEM0002	0.658 0.070*	0.656 0.043*	-1.003 0.152*	0.549 0.036*	0.144 0.063*	195.0 (0.0000)	8.0
ITEM0003	-0.457 0.030*	0.592 0.032*	0.771 0.045*	0.510 0.027*	0.018 0.009*	132.9 (0.0000)	8.0
ITEM0004	-1.573 0.040*	0.039 0.009*	40.522 9.929*	0.039 0.009*	0.002 0.001*	241.6 (0.0000)	6.0
ITEM0005	-0.716 0.021*	0.025 0.006*	28.954 6.599*	0.025 0.006*	0.006 0.003*	275.5 (0.0000)	9.0
ITEM0006	-0.991 0.152*	0.651 0.097*	1.522 0.088*	0.546 0.082*	0.202 0.026*	5.9 (0.6545)	8.0
ITEM0007	-1.040 0.184*	0.338 0.076*	3.074 0.321*	0.320 0.072*	0.136 0.036*	41.3 (0.0000)	8.0
ITEM0008	-4.444 1.241*	1.899 0.644*	2.340 0.170*	0.885 0.300*	0.218 0.007*	259.4 (0.0000)	9.0
ITEM0009	-0.765 0.111*	1.003 0.099*	0.763 0.055*	0.708 0.070*	0.219 0.021*	20.7 (0.0141)	9.0
ITEM0010	-0.449 0.026*	0.032 0.007*	14.028 3.245*	0.032 0.007*	0.022 0.011*	107.3 (0.0000)	9.0
ITEM0011	-0.922 0.145*	0.850 0.108*	1.085 0.070*	0.648 0.082*	0.290 0.023*	18.5 (0.0298)	9.0
ITEM0012	-0.612 0.033*	0.674 0.035*	0.908 0.042*	0.559 0.029*	0.016 0.008*	80.2 (0.0000)	8.0
ITEM0013	-2.468 0.122*	0.135 0.038*	18.301 5.293*	0.134 0.038*	0.005 0.002*	24.9 (0.0004)	6.0
ITEM0014	-0.670 0.018*	0.013 0.003*	49.794 10.909*	0.013 0.003*	0.002 0.001*	1328.3 (0.0000)	7.0
ITEM0015	-0.962 0.162*	1.455 0.167*	0.661 0.053*	0.824 0.094*	0.439 0.017*	33.1 (0.0001)	9.0
ITEM0016	-0.358 0.148*	0.452 0.071*	0.792 0.223*	0.412 0.065*	0.239 0.058*	23.0 (0.0034)	8.0
ITEM0017	-0.397 0.029*	0.768 0.035*	0.517 0.032*	0.609 0.028*	0.016 0.008*	98.6 (0.0000)	7.0
ITEM0018	-1.058 0.025*	0.021 0.005*	50.798 11.612*	0.021 0.005*	0.002 0.001*	554.5 (0.0000)	6.0
ITEM0019	-0.598 0.039*	0.503 0.033*	1.189 0.068*	0.449 0.030*	0.025 0.012*	108.2 (0.0000)	8.0

ITEM0020	-0.925 0.022*	0.018 0.004*	50.677 11.421*	0.018 0.004*	0.002 0.001*	817.4 (0.0000)	7.0
ITEM0021	-0.481 0.156*	0.346 0.062*	1.390 0.259*	0.327 0.058*	0.194 0.059*	35.0 (0.0000)	8.0
ITEM0022	-2.026 0.309*	1.078 0.194*	1.880 0.102*	0.733 0.132*	0.335 0.013*	33.3 (0.0001)	9.0
ITEM0023	-0.483 0.032*	0.590 0.032*	0.818 0.047*	0.508 0.028*	0.020 0.010*	115.1 (0.0000)	8.0
ITEM0024	-0.938 0.023*	0.018 0.004*	51.936 11.698*	0.018 0.004*	0.002 0.001*	693.9 (0.0000)	6.0
ITEM0025	-0.417 0.031*	0.755 0.036*	0.552 0.034*	0.603 0.029*	0.018 0.009*	91.4 (0.0000)	8.0
ITEM0026	-0.842 0.021*	0.016 0.004*	51.172 11.418*	0.016 0.004*	0.002 0.001*	996.1 (0.0000)	7.0
ITEM0027	-0.381 0.093*	0.524 0.055*	0.727 0.121*	0.464 0.048*	0.113 0.039*	34.7 (0.0000)	8.0
ITEM0028	-2.397 0.388*	1.194 0.237*	2.008 0.115*	0.767 0.152*	0.294 0.011*	21.2 (0.0117)	9.0
ITEM0029	-0.500 0.031*	0.708 0.035*	0.706 0.037*	0.578 0.029*	0.017 0.008*	90.4 (0.0000)	7.0
ITEM0030	-0.853 0.021*	0.017 0.004*	50.523 11.299*	0.017 0.004*	0.002 0.001*	899.2 (0.0000)	7.0
ITEM0031	-0.472 0.130*	0.710 0.092*	0.664 0.113*	0.579 0.075*	0.297 0.036*	22.8 (0.0036)	8.0
ITEM0032	-2.390 0.369*	1.618 0.258*	1.477 0.056*	0.851 0.136*	0.397 0.011*	73.6 (0.0000)	8.0
ITEM0033	-0.295 0.107*	0.530 0.061*	0.556 0.151*	0.469 0.054*	0.156 0.048*	35.0 (0.0000)	8.0
ITEM0034	-3.775 0.815*	2.012 0.478*	1.876 0.077*	0.896 0.213*	0.344 0.009*	152.3 (0.0000)	9.0
ITEM0035	-0.193 0.032*	1.003 0.045*	0.193 0.029*	0.708 0.032*	0.021 0.010*	90.6 (0.0000)	8.0
ITEM0036	-1.053 0.025*	0.022 0.005*	48.618 11.145*	0.022 0.005*	0.002 0.001*	553.6 (0.0000)	7.0
ITEM0037	-0.458 0.116*	0.082 0.017*	5.597 1.600*	0.082 0.017*	0.171 0.051*	59.1 (0.0000)	9.0
ITEM0038	-1.258 0.176*	1.403 0.161*	0.897 0.047*	0.814 0.093*	0.376 0.015*	31.1 (0.0003)	9.0
ITEM0039	-0.431 0.030*	0.657 0.033*	0.656 0.039*	0.549 0.028*	0.017 0.008*	125.9 (0.0000)	8.0

* STANDARD ERROR

LARGEST CHANGE = 0.061693

9587.1 309.0
(0.0000)

PARAMETER	MEAN	STN DEV
ASYMPTOTE	0.123	0.139
SLOPE	0.601	0.550
LOG(SLOPE)	-1.376	1.720
THRESHOLD	13.213	19.793

BILOG-MG V3.0
REV 19990104.1300

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*** BILOG-MG ITEM MAINTENANCE PROGRAM ***

*** PHASE 1 ***

NTtest2551 Bilog Analysis of m3subj_math.dat
>COMMENT This is the same data set analyzed in the R templates
>GLOBAL DFName = 'm3subj1.dat',

NPArm = 3;

ITEM STATISTICS FOR SUBTEST TEST1

ITEM	NAME	#TRIED	#RIGHT	PCT	ITEM*TEST CORRELATION		
					LOGIT/1.7	PEARSON	BISERIAL
1	ITEM0001	5011.0	1480.0	29.5	0.51	-0.054	-0.072
2	ITEM0002	5011.0	3776.0	75.4	-0.66	0.154	0.211
3	ITEM0003	5011.0	1796.0	35.8	0.34	0.128	0.164
4	ITEM0004	5011.0	187.0	3.7	1.91	-0.042	-0.097
5	ITEM0005	5011.0	1003.0	20.0	0.81	-0.034	-0.049
6	ITEM0006	5011.0	1826.0	36.4	0.33	0.162	0.208
7	ITEM0007	5011.0	1370.0	27.3	0.57	0.107	0.144
8	ITEM0008	5011.0	1155.0	23.0	0.71	0.185	0.257
9	ITEM0009	5011.0	2274.0	45.4	0.11	0.254	0.319
10	ITEM0010	5011.0	1609.0	32.1	0.44	0.037	0.048
11	ITEM0011	5011.0	2324.0	46.4	0.09	0.232	0.291
12	ITEM0012	5011.0	1589.0	31.7	0.45	0.179	0.234
13	ITEM0013	5011.0	77.0	1.5	2.45	-0.026	-0.081
14	ITEM0014	5011.0	706.0	14.1	1.06	0.005	0.008
15	ITEM0015	5011.0	3056.0	61.0	-0.26	0.313	0.398
16	ITEM0016	5011.0	2610.0	52.1	-0.05	0.214	0.268
17	ITEM0017	5011.0	1949.0	38.9	0.27	0.204	0.259
18	ITEM0018	5011.0	383.0	7.6	1.47	0.020	0.036
19	ITEM0019	5011.0	1558.0	31.1	0.47	0.118	0.155
20	ITEM0020	5011.0	483.0	9.6	1.32	0.019	0.033
21	ITEM0021	5011.0	2263.0	45.2	0.11	0.160	0.201
22	ITEM0022	5011.0	1965.0	39.2	0.26	0.199	0.253
23	ITEM0023	5011.0	1757.0	35.1	0.36	0.142	0.183
24	ITEM0024	5011.0	455.0	9.1	1.36	0.031	0.055

25	ITEM0025	5011.0	1921.0	38.3	0.28	0.212	0.270
26	ITEM0026	5011.0	541.0	10.8	1.24	0.019	0.032
27	ITEM0027	5011.0	2194.0	43.8	0.15	0.220	0.277
28	ITEM0028	5011.0	1695.0	33.8	0.39	0.179	0.231
29	ITEM0029	5011.0	1773.0	35.4	0.35	0.206	0.265
30	ITEM0030	5011.0	543.0	10.8	1.24	0.019	0.032
31	ITEM0031	5011.0	2731.0	54.5	-0.11	0.248	0.312
32	ITEM0032	5011.0	2311.0	46.1	0.09	0.263	0.330
33	ITEM0033	5011.0	2460.0	49.1	0.02	0.225	0.282
34	ITEM0034	5011.0	1868.0	37.3	0.31	0.188	0.240
35	ITEM0035	5011.0	2323.0	46.4	0.09	0.247	0.311
36	ITEM0036	5011.0	412.0	8.2	1.42	-0.012	-0.021
37	ITEM0037	5011.0	2158.0	43.1	0.16	0.123	0.154
38	ITEM0038	5011.0	2636.0	52.6	-0.06	0.268	0.336
39	ITEM0039	5011.0	1859.0	37.1	0.31	0.147	0.189
40	ITEM0040	5011.0	0.0	0.0	99.99	0.000	0.000

BILOG-MG V3.0
REV 19990329.1300

BILOG-MG ITEM MAINTENANCE PROGRAM: LOGISTIC ITEM RESPONSE MODEL

*** BILOG-MG ITEM MAINTENANCE PROGRAM ***

*** PHASE 2 ***

INTERVAL COUNTS FOR COMPUTATION OF ITEM CHI-SQUARES

0. 0. 1223. 701. 1171. 1260. 506. 147. 3.

INTERVAL AVERAGE THETAS

***** -1.369 -0.551 0.094 0.741 1.385 2.091 2.529

1

SUBTEST TEST2 ; ITEM PARAMETERS AFTER CYCLE 27

ITEM	INTERCEPT S.E.	SLOPE S.E.	THRESHOLD S.E.	LOADING S.E.	ASYMPTOTE S.E.	CHISQ (PROB)	DF
ITEM0001	-6.632 3.343*	2.905 1.991*	2.283 0.245*	0.946 0.648*	0.006 0.002*	0.0 (0.0000)	0.0
ITEM0002	-2.720 0.199*	0.511 0.170*	5.320 1.553*	0.455 0.151*	0.006 0.003*	41.3 (0.0000)	5.0
ITEM0003	-1.142 0.030*	0.031 0.007*	37.340 9.083*	0.031 0.007*	0.001 0.001*	412.4 (0.0000)	2.0
ITEM0004	-0.730 0.041*	0.481 0.042*	1.516 0.100*	0.434 0.038*	0.025 0.012*	144.9 (0.0000)	6.0
ITEM0007	-3.409 0.952*	0.553 0.232*	6.166 2.936*	0.484 0.203*	0.007 0.003*	3.7 (0.0000)	0.0
ITEM0008	-3.101 0.256*	0.558 0.206*	5.555 1.789*	0.487 0.180*	0.004 0.002*	18.8 (0.0021)	5.0
ITEM0009	-1.380 0.039*	0.044 0.011*	31.397 8.004*	0.044 0.011*	0.001 0.000*	148.0 (0.0000)	0.0

ITEM0011	-1.231 0.036*	0.038 0.009*	32.673 8.155*	0.038 0.009*	0.004 0.002*	264.1 (0.0000)	2.0
ITEM0012	-0.968 0.050*	0.702 0.058*	1.378 0.068*	0.575 0.048*	0.022 0.010*	74.6 (0.0000)	5.0
ITEM0013	-1.415 0.039*	0.044 0.011*	32.236 8.218*	0.044 0.011*	0.001 0.001*	244.5 (0.0000)	2.0
ITEM0014	-1.267 0.099*	0.960 0.110*	1.319 0.055*	0.693 0.080*	0.038 0.014*	109.4 (0.0000)	6.0
ITEM0015	-1.447 0.040*	0.046 0.011*	31.450 8.069*	0.046 0.011*	0.001 0.001*	230.7 (0.0000)	2.0
ITEM0016	-0.986 0.056*	0.475 0.051*	2.074 0.151*	0.429 0.046*	0.027 0.013*	130.4 (0.0000)	6.0
ITEM0017	-1.606 0.048*	0.059 0.015*	27.450 7.293*	0.058 0.015*	0.001 0.000*	101.6 (0.0000)	0.0
ITEM0018	-1.427 0.090*	0.695 0.084*	2.053 0.128*	0.571 0.069*	0.026 0.011*	82.4 (0.0000)	6.0
ITEM0019	-6.060 2.676*	2.794 1.640*	2.169 0.161*	0.942 0.553*	0.007 0.002*	0.0 (0.0000)	0.0
ITEM0020	-3.087 0.274*	0.556 0.202*	5.556 1.735*	0.486 0.176*	0.005 0.002*	18.2 (0.0028)	5.0
ITEM0021	-1.129 0.029*	0.030 0.007*	38.247 9.264*	0.030 0.007*	0.002 0.001*	448.6 (0.0000)	2.0
ITEM0022	-0.665 0.041*	0.736 0.053*	0.903 0.047*	0.593 0.043*	0.024 0.012*	79.4 (0.0000)	5.0
ITEM0023	-1.194 0.031*	0.033 0.008*	36.664 8.988*	0.033 0.008*	0.002 0.001*	382.8 (0.0000)	2.0
ITEM0024	-0.734 0.045*	0.630 0.050*	1.166 0.063*	0.533 0.042*	0.027 0.013*	55.1 (0.0000)	5.0
ITEM0025	-1.486 0.043*	0.051 0.013*	29.412 7.646*	0.050 0.013*	0.001 0.000*	204.6 (0.0000)	2.0
ITEM0026	-0.989 0.061*	0.413 0.050*	2.395 0.204*	0.382 0.046*	0.031 0.015*	139.4 (0.0000)	6.0
ITEM0027	-1.382 0.038*	0.042 0.010*	32.833 8.322*	0.042 0.010*	0.001 0.001*	258.8 (0.0000)	2.0
ITEM0028	-1.181 0.090*	0.755 0.088*	1.565 0.078*	0.602 0.070*	0.038 0.015*	73.0 (0.0000)	6.0
ITEM0029	-1.449 0.040*	0.046 0.012*	31.235 8.023*	0.046 0.012*	0.001 0.001*	216.7 (0.0000)	2.0
ITEM0030	-1.155 0.086*	0.807 0.089*	1.432 0.067*	0.628 0.070*	0.037 0.015*	84.1 (0.0000)	6.0
ITEM0031	-1.477 0.042*	0.049 0.012*	30.180 7.811*	0.049 0.012*	0.001 0.000*	191.9 (0.0000)	2.0
ITEM0032	-1.073 0.074*	0.464 0.059*	2.314 0.184*	0.421 0.054*	0.035 0.016*	121.8 (0.0000)	6.0
ITEM0033	-5.684 2.357*	2.656 1.468*	2.140 0.149*	0.936 0.517*	0.008 0.002*	0.0 (0.0000)	0.0

ITEM0034	-2.730 0.195*	0.494 0.168*	5.523 1.682*	0.443 0.151*	0.006 0.003*	34.8 (0.0000)	4.0
ITEM0035	-1.301 0.035*	0.038 0.009*	33.941 8.495*	0.038 0.009*	0.001 0.001*	289.0 (0.0000)	2.0
ITEM0036	-0.752 0.046*	0.527 0.046*	1.428 0.088*	0.466 0.041*	0.028 0.014*	118.8 (0.0000)	6.0
ITEM0037	-1.413 0.039*	0.045 0.011*	31.583 8.071*	0.045 0.011*	0.001 0.001*	231.5 (0.0000)	2.0
ITEM0038	-0.899 0.052*	0.470 0.048*	1.913 0.135*	0.425 0.043*	0.028 0.014*	148.4 (0.0000)	6.0
ITEM0039	-1.574 0.045*	0.054 0.014*	29.002 7.621*	0.054 0.014*	0.001 0.001*	172.5 (0.0000)	2.0
ITEM0040	-1.115 0.063*	0.481 0.056*	2.319 0.180*	0.433 0.050*	0.026 0.012*	97.8 (0.0000)	6.0

* STANDARD ERROR

LARGEST CHANGE = 1.484992

5373.9 126.0
(0.0000)

PARAMETER	MEAN	STN DEV
ASYMPTOTE	0.013	0.013
SLOPE	0.548	0.732
LOG(SLOPE)	-1.480	1.483
THRESHOLD	14.706	14.973

BILOG-MG V3.0

REV 19990104.1300

BILOG-MG ITEM MAINTENANCE PROGRAM: LOGISTIC ITEM RESPONSE MODEL

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*** BILOG-MG ITEM MAINTENANCE PROGRAM ***

*** PHASE 1 ***

NTtest2551 Bilog Analysis of m3subj_science.dat
 >COMMENT This is the same data set analyzed in the R templates

					ITEM*TEST CORRELATION	
ITEM	NAME	#TRIED	#RIGHT	PCT	LOGIT/1.7	PEARSON BISERIAL

1	ITEM0001	5011.0	1819.0	36.3	0.33	0.120	0.154
2	ITEM0002	5011.0	2341.0	46.7	0.08	0.148	0.186
3	ITEM0003	5011.0	2836.0	56.6	-0.16	0.212	0.267
4	ITEM0004	5011.0	2079.0	41.5	0.20	0.133	0.168
5	ITEM0005	5011.0	1479.0	29.5	0.51	0.053	0.070
6	ITEM0006	5011.0	2908.0	58.0	-0.19	0.144	0.182
7	ITEM0007	5011.0	3370.0	67.3	-0.42	0.074	0.096
8	ITEM0008	5011.0	3621.0	72.3	-0.56	0.189	0.253
9	ITEM0009	5011.0	3450.0	68.8	-0.47	0.292	0.383
10	ITEM0010	5011.0	2511.0	50.1	0.00	0.179	0.224
11	ITEM0011	5011.0	971.0	19.4	0.84	0.113	0.163
12	ITEM0012	5011.0	395.0	7.9	1.45	-0.036	-0.065
13	ITEM0013	5011.0	2294.0	45.8	0.10	0.091	0.114
14	ITEM0014	5011.0	215.0	4.3	1.83	0.018	0.040
15	ITEM0015	5011.0	1020.0	20.4	0.80	0.103	0.147
16	ITEM0016	5011.0	55.0	1.1	2.65	0.000	0.000
17	ITEM0017	5011.0	447.0	8.9	1.37	0.005	0.008
18	ITEM0018	5011.0	1966.0	39.2	0.26	0.147	0.187
19	ITEM0019	5011.0	53.0	1.1	2.67	-0.022	-0.077
20	ITEM0020	5011.0	362.0	7.2	1.50	0.022	0.041
21	ITEM0021	5011.0	1874.0	37.4	0.30	0.212	0.271
22	ITEM0022	5011.0	1386.0	27.7	0.57	0.135	0.181
23	ITEM0023	5011.0	914.0	18.2	0.88	0.053	0.078
24	ITEM0024	5011.0	1684.0	33.6	0.40	0.023	0.030
25	ITEM0025	5011.0	493.0	9.8	1.30	-0.050	-0.086
26	ITEM0026	5011.0	2165.0	43.2	0.16	0.117	0.148
27	ITEM0027	5011.0	1538.0	30.7	0.48	0.132	0.174
28	ITEM0028	5011.0	1395.0	27.8	0.56	0.033	0.044
29	ITEM0029	5011.0	1740.0	34.7	0.37	0.042	0.054
30	ITEM0030	5011.0	1529.0	30.5	0.48	0.039	0.051
31	ITEM0031	5011.0	2132.0	42.5	0.18	0.105	0.133
32	ITEM0032	5011.0	2427.0	48.4	0.04	0.133	0.167
33	ITEM0033	5011.0	1423.0	28.4	0.54	0.142	0.188
34	ITEM0034	5011.0	2610.0	52.1	-0.05	0.246	0.309
35	ITEM0035	5011.0	2575.0	51.4	-0.03	0.273	0.343
36	ITEM0036	5011.0	2628.0	52.4	-0.06	0.300	0.376
37	ITEM0037	5011.0	1652.0	33.0	0.42	0.207	0.269
38	ITEM0038	5011.0	1121.0	22.4	0.73	0.083	0.116
39	ITEM0039	5011.0	0.0	0.0	99.99	0.000	0.000
40	ITEM0040	5011.0	0.0	0.0	99.99	0.000	0.000

*** PHASE 2 ***

INTERVAL COUNTS FOR COMPUTATION OF ITEM CHI-SQUARES

11. 198. 470. 767. 902. 912. 819. 565. 367.

INTERVAL AVERAGE THETAS

-2.270 -1.868 -1.394 -0.880 -0.356 0.157 0.670 1.170 1.890

1

SUBTEST TEST3 ; ITEM PARAMETERS AFTER CYCLE 28

ITEM	INTERCEPT S.E.	SLOPE S.E.	THRESHOLD S.E.	LOADING S.E.	ASYMPTOTE S.E.	CHISQ (PROB)	DF
ITEM0001	-5.936 3.120*	3.020 1.683*	1.966 0.105*	0.949 0.529*	0.492 0.008*	456.5 (0.0000)	9.0
ITEM0002	-0.613 0.202*	0.264 0.061*	2.319 0.428*	0.256 0.059*	0.270 0.062*	19.2 (0.0140)	8.0

ITEM0003	-0.117 0.120*	0.568 0.070*	0.205 0.192*	0.494 0.061*	0.196 0.061*	57.7 (0.0000)	8.0
ITEM0004	-0.505 0.139*	0.359 0.058*	1.405 0.225*	0.338 0.054*	0.150 0.054*	22.9 (0.0034)	8.0
ITEM0005	-0.552 0.035*	0.044 0.010*	12.618 2.933*	0.044 0.010*	0.031 0.014*	97.9 (0.0000)	9.0
ITEM0006	-1.380 0.310*	0.704 0.178*	1.960 0.189*	0.576 0.146*	0.500 0.021*	51.0 (0.0000)	9.0
ITEM0007	0.019 0.156*	0.137 0.026*	-0.136 1.151*	0.136 0.026*	0.333 0.088*	15.3 (0.0821)	9.0
ITEM0008	0.447 0.081*	0.335 0.031*	-1.331 0.316*	0.318 0.029*	0.159 0.072*	93.6 (0.0000)	8.0
ITEM0009	0.470 0.071*	0.843 0.066*	-0.558 0.115*	0.644 0.050*	0.129 0.054*	199.7 (0.0000)	8.0
ITEM0010	-0.210 0.091*	0.639 0.063*	0.328 0.119*	0.539 0.053*	0.124 0.043*	60.2 (0.0000)	8.0
ITEM0011	-1.892 0.234*	0.885 0.146*	2.139 0.127*	0.663 0.109*	0.122 0.012*	9.3 (0.3159)	8.0
ITEM0012	-1.220 0.029*	0.031 0.007*	39.592 9.389*	0.031 0.007*	0.003 0.001*	294.1 (0.0000)	7.0
ITEM0013	-0.270 0.080*	0.507 0.048*	0.532 0.123*	0.452 0.043*	0.091 0.039*	66.7 (0.0000)	8.0
ITEM0014	-1.664 0.043*	0.053 0.013*	31.122 7.851*	0.053 0.013*	0.003 0.002*	117.7 (0.0000)	7.0
ITEM0015	-1.373 0.158*	0.668 0.099*	2.055 0.119*	0.555 0.082*	0.086 0.018*	13.4 (0.0995)	8.0
ITEM0016	-2.563 0.118*	0.115 0.032*	22.302 6.432*	0.114 0.032*	0.003 0.002*	30.0 (0.0000)	4.0
ITEM0017	-1.165 0.027*	0.030 0.007*	38.341 9.070*	0.030 0.007*	0.003 0.001*	394.2 (0.0000)	8.0
ITEM0018	-0.378 0.044*	0.561 0.037*	0.675 0.062*	0.489 0.032*	0.037 0.018*	104.2 (0.0000)	8.0
ITEM0019	-2.557 0.115*	0.111 0.031*	23.134 6.625*	0.110 0.030*	0.003 0.001*	31.0 (0.0000)	5.0
ITEM0020	-1.309 0.031*	0.036 0.008*	36.569 8.812*	0.036 0.008*	0.003 0.002*	234.0 (0.0000)	7.0
ITEM0021	-0.921 0.152*	0.746 0.107*	1.235 0.078*	0.598 0.086*	0.186 0.028*	40.5 (0.0000)	8.0
ITEM0022	-1.122 0.175*	0.525 0.096*	2.136 0.149*	0.465 0.085*	0.139 0.028*	22.1 (0.0048)	8.0
ITEM0023	-5.313 1.851*	1.966 0.800*	2.703 0.210*	0.891 0.363*	0.176 0.006*	44.5 (0.0000)	8.0
ITEM0024	-0.619 0.108*	0.283 0.042*	2.190 0.251*	0.272 0.040*	0.093 0.040*	44.2 (0.0000)	8.0
ITEM0025	-1.046	0.024	42.962	0.024	0.003	315.7	6.0

	0.025*	0.006*	9.952*	0.006*	0.001*	(0.0000)	
ITEM0026	-0.397	0.306	1.297	0.292	0.131	38.0	8.0
	0.118*	0.044*	0.265*	0.042*	0.054*	(0.0000)	
ITEM0027	-1.139	0.529	2.154	0.467	0.178	11.0	8.0
	0.194*	0.104*	0.160*	0.092*	0.029*	(0.2034)	
ITEM0028	-4.701	1.785	2.633	0.872	0.270	14.3	9.0
	1.534*	0.680*	0.208*	0.332*	0.007*	(0.1114)	
ITEM0029	-0.835	0.187	4.457	0.184	0.185	13.4	9.0
	0.184*	0.044*	0.781*	0.043*	0.049*	(0.1468)	
ITEM0030	-0.657	0.078	8.482	0.077	0.081	20.4	9.0
	0.086*	0.017*	1.961*	0.017*	0.033*	(0.0157)	
ITEM0031	-0.675	0.175	3.852	0.173	0.239	19.8	9.0
	0.187*	0.041*	0.801*	0.040*	0.057*	(0.0189)	
ITEM0032	-0.195	0.354	0.550	0.333	0.104	54.1	8.0
	0.083*	0.036*	0.199*	0.034*	0.047*	(0.0000)	
ITEM0033	-3.690	1.433	2.575	0.820	0.270	34.7	9.0
	0.886*	0.418*	0.196*	0.239*	0.008*	(0.0001)	
ITEM0034	-0.291	0.503	0.578	0.450	0.207	31.3	8.0
	0.135*	0.070*	0.204*	0.063*	0.058*	(0.0001)	
ITEM0035	-0.510	0.627	0.814	0.531	0.272	42.6	8.0
	0.154*	0.097*	0.144*	0.082*	0.045*	(0.0000)	
ITEM0036	-0.300	0.975	0.308	0.698	0.182	97.5	8.0
	0.102*	0.100*	0.080*	0.072*	0.034*	(0.0000)	
ITEM0037	-1.326	0.878	1.510	0.660	0.200	21.7	8.0
	0.183*	0.128*	0.073*	0.096*	0.019*	(0.0054)	
ITEM0038	-1.056	0.465	2.273	0.421	0.068	20.6	8.0
	0.126*	0.068*	0.156*	0.062*	0.024*	(0.0082)	

* STANDARD ERROR

LARGEST CHANGE = 0.150000

3255.1 301.0
(0.0000)

PARAMETER	MEAN	STN DEV
ASYMPTOTE	0.151	0.123
SLOPE	0.572	0.614
LOG(SLOPE)	-1.147	1.247
THRESHOLD	7.841	12.971

BILOG-MG V3.0
REV 19990104.1300

BILOG-MG ITEM MAINTENANCE PROGRAM: LOGISTIC ITEM RESPONSE MODEL

*** PHASE 1_social ***

ITEM*TEST CORRELATION

ITEM	NAME	#TRIED	#RIGHT	PCT	LOGIT/1.7	PEARSON	BISERIAL
1	ITEM0001	5011.0	349.0	7.0	1.52	0.106	0.201
2	ITEM0002	5011.0	1379.0	27.5	0.57	0.180	0.241
3	ITEM0003	5011.0	1993.0	39.8	0.24	0.281	0.357
4	ITEM0004	5011.0	1272.0	25.4	0.63	0.116	0.158
5	ITEM0005	5011.0	497.0	9.9	1.30	0.085	0.146
6	ITEM0006	5011.0	2051.0	40.9	0.22	0.107	0.135
7	ITEM0007	5011.0	75.0	1.5	2.46	0.003	0.008
8	ITEM0008	5011.0	578.0	11.5	1.20	0.097	0.159
9	ITEM0009	5011.0	2427.0	48.4	0.04	0.247	0.309
10	ITEM0010	5011.0	1039.0	20.7	0.79	0.102	0.145
11	ITEM0011	5011.0	1846.0	36.8	0.32	0.153	0.195
12	ITEM0012	5011.0	400.0	8.0	1.44	0.071	0.129
13	ITEM0013	5011.0	2004.0	40.0	0.24	0.202	0.257
14	ITEM0014	5011.0	2595.0	51.8	-0.04	0.205	0.257
15	ITEM0015	5011.0	2330.0	46.5	0.08	0.202	0.253
16	ITEM0016	5011.0	1939.0	38.7	0.27	0.241	0.306
17	ITEM0017	5011.0	1545.0	30.8	0.48	0.138	0.182
18	ITEM0018	5011.0	578.0	11.5	1.20	0.081	0.133
19	ITEM0019	5011.0	2439.0	48.7	0.03	0.237	0.297
20	ITEM0020	5011.0	1999.0	39.9	0.24	0.243	0.308
21	ITEM0021	5011.0	1419.0	28.3	0.55	0.130	0.173
22	ITEM0022	5011.0	1229.0	24.5	0.66	0.069	0.094
23	ITEM0023	5011.0	451.0	9.0	1.36	0.093	0.164
24	ITEM0024	5011.0	1911.0	38.1	0.28	0.249	0.317
25	ITEM0025	5011.0	1792.0	35.8	0.34	0.197	0.253
26	ITEM0026	5011.0	2433.0	48.6	0.03	0.274	0.344
27	ITEM0027	5011.0	1875.0	37.4	0.30	0.172	0.220
28	ITEM0028	5011.0	1683.0	33.6	0.40	0.173	0.224
29	ITEM0029	5011.0	2027.0	40.5	0.23	0.116	0.147
30	ITEM0030	5011.0	52.0	1.0	2.68	0.001	0.004
31	ITEM0031	5011.0	451.0	9.0	1.36	0.040	0.071
32	ITEM0032	5011.0	2110.0	42.1	0.19	0.128	0.162
33	ITEM0033	5011.0	1590.0	31.7	0.45	0.193	0.253
34	ITEM0034	5011.0	1865.0	37.2	0.31	0.161	0.205
35	ITEM0035	5011.0	1758.0	35.1	0.36	0.099	0.127
36	ITEM0036	5011.0	322.0	6.4	1.58	0.027	0.053
37	ITEM0037	5011.0	1642.0	32.8	0.42	0.134	0.174
38	ITEM0038	5011.0	1462.0	29.2	0.52	0.164	0.217
39	ITEM0039	5011.0	1757.0	35.1	0.36	0.046	0.060
40	ITEM0040	5011.0	0.0	0.0	99.99	0.000	0.000

*** PHASE 2 ***

INTERVAL COUNTS FOR COMPUTATION OF ITEM CHI-SQUARES

4. 431. 641. 709. 792. 863. 716. 445. 410.

INTERVAL AVERAGE THETAS

-1.895 -1.570 -1.162 -0.677 -0.197 0.262 0.730 1.198 1.910

1

SUBTEST TEST4 ; ITEM PARAMETERS AFTER CYCLE 37

ITEM	INTERCEPT S.E.	SLOPE S.E.	THRESHOLD S.E.	LOADING S.E.	ASYMPTOTE S.E.	CHISQ (PROB)	DF
ITEM0001	-1.349 0.114*	0.057 0.014*	23.493 6.204*	0.057 0.014*	0.153 0.017*	882.2 (0.0000)	6.0
ITEM0002	-2.905 0.584*	1.069 0.291*	2.719 0.255*	0.730 0.199*	0.255 0.009*	37.2 (0.0000)	8.0

ITEM0003	-1.449 0.190*	1.123 0.139*	1.290 0.057*	0.747 0.092*	0.273 0.016*	25.0 (0.0016)	8.0
ITEM0004	-0.880 0.088*	0.516 0.054*	1.706 0.098*	0.458 0.048*	0.050 0.021*	76.5 (0.0000)	8.0
ITEM0005	-0.974 0.023*	0.021 0.005*	46.963 10.719*	0.021 0.005*	0.002 0.001*	760.4 (0.0000)	6.0
ITEM0006	-0.326 0.037*	0.641 0.036*	0.509 0.048*	0.539 0.030*	0.030 0.014*	157.4 (0.0000)	7.0
ITEM0007	-2.616 0.173*	0.174 0.051*	15.045 4.512*	0.171 0.050*	0.006 0.003*	10.4 (0.1087)	6.0
ITEM0008	-0.882 0.022*	0.019 0.004*	46.679 10.552*	0.019 0.004*	0.002 0.001*	802.2 (0.0000)	6.0
ITEM0009	-0.175 0.058*	0.906 0.061*	0.193 0.056*	0.672 0.045*	0.060 0.025*	134.6 (0.0000)	7.0
ITEM0010	-5.529 2.101*	2.085 0.930*	2.651 0.216*	0.902 0.402*	0.201 0.006*	178.1 (0.0000)	8.0
ITEM0011	-0.464 0.042*	0.667 0.039*	0.695 0.048*	0.555 0.032*	0.029 0.014*	130.4 (0.0000)	7.0
ITEM0012	-1.163 0.027*	0.027 0.006*	42.594 9.995*	0.027 0.006*	0.002 0.001*	370.0 (0.0000)	6.0
ITEM0013	-2.599 0.529*	1.166 0.289*	2.228 0.155*	0.759 0.188*	0.369 0.011*	29.1 (0.0003)	8.0
ITEM0014	-0.725 0.184*	0.589 0.103*	1.230 0.144*	0.508 0.089*	0.344 0.038*	19.0 (0.0149)	8.0
ITEM0015	-0.399 0.144*	0.371 0.058*	1.076 0.257*	0.348 0.055*	0.178 0.061*	41.3 (0.0000)	8.0
ITEM0016	-1.043 0.165*	0.725 0.105*	1.440 0.085*	0.587 0.085*	0.234 0.025*	17.3 (0.0276)	8.0
ITEM0017	-0.689 0.069*	0.593 0.049*	1.161 0.069*	0.510 0.042*	0.046 0.020*	89.2 (0.0000)	8.0
ITEM0018	-0.903 0.022*	0.020 0.004*	45.195 10.266*	0.020 0.004*	0.002 0.001*	640.4 (0.0000)	6.0
ITEM0019	-0.391 0.142*	0.488 0.072*	0.802 0.194*	0.438 0.064*	0.198 0.055*	55.0 (0.0000)	8.0
ITEM0020	-1.173 0.173*	0.923 0.125*	1.271 0.066*	0.678 0.092*	0.251 0.020*	11.3 (0.1828)	8.0
ITEM0021	-2.603 0.414*	1.239 0.235*	2.100 0.107*	0.778 0.148*	0.243 0.010*	8.8 (0.3578)	8.0
ITEM0022	-0.923 0.102*	0.465 0.057*	1.986 0.125*	0.421 0.051*	0.059 0.024*	60.2 (0.0000)	8.0
ITEM0023	-1.070 0.025*	0.024 0.005*	44.426 10.291*	0.024 0.005*	0.002 0.001*	502.2 (0.0000)	6.0
ITEM0024	-1.321 0.182*	1.021 0.135*	1.293 0.060*	0.715 0.094*	0.245 0.018*	15.4 (0.0524)	8.0
ITEM0025	-2.989	1.325	2.256	0.798	0.332	65.7	8.0

	0.582*	0.303*	0.131*	0.183*	0.010*	(0.0000)	
ITEM0026	-0.727	0.934	0.778	0.683	0.264	22.2	8.0
	0.139*	0.114*	0.074*	0.083*	0.027*	(0.0045)	
ITEM0027	-1.665	0.931	1.789	0.681	0.293	2.1	8.0
	0.252*	0.157*	0.094*	0.115*	0.016*	(0.9790)	
ITEM0028	-2.146	0.950	2.259	0.689	0.290	50.5	8.0
	0.347*	0.191*	0.148*	0.139*	0.013*	(0.0000)	
ITEM0029	-0.340	0.652	0.522	0.546	0.028	181.1	7.0
	0.036*	0.036*	0.046*	0.030*	0.014*	(0.0000)	
ITEM0030	-2.973	0.232	12.801	0.226	0.006	4.1	6.0
	0.274*	0.073*	4.122*	0.071*	0.003*	(0.6692)	
ITEM0031	-1.046	0.023	45.896	0.023	0.002	578.0	6.0
	0.025*	0.005*	10.571*	0.005*	0.001*	(0.0000)	
ITEM0032	-0.484	0.298	1.620	0.286	0.155	43.7	8.0
	0.142*	0.050*	0.292*	0.048*	0.058*	(0.0000)	
ITEM0033	-1.738	0.926	1.877	0.680	0.238	16.6	8.0
	0.235*	0.143*	0.093*	0.105*	0.014*	(0.0343)	
ITEM0034	-1.791	0.665	2.693	0.554	0.323	29.7	8.0
	0.333*	0.172*	0.287*	0.143*	0.017*	(0.0002)	
ITEM0035	-0.477	0.523	0.912	0.464	0.026	213.7	8.0
	0.037*	0.033*	0.061*	0.029*	0.013*	(0.0000)	
ITEM0036	-1.285	0.030	42.301	0.030	0.002	361.8	6.0
	0.031*	0.007*	10.053*	0.007*	0.001*	(0.0000)	
ITEM0037	-1.117	0.413	2.701	0.382	0.209	18.5	8.0
	0.219*	0.098*	0.262*	0.091*	0.035*	(0.0176)	
ITEM0038	-2.791	1.067	2.616	0.730	0.269	50.3	8.0
	0.526*	0.265*	0.217*	0.181*	0.010*	(0.0000)	
ITEM0039	-0.476	0.467	1.020	0.423	0.032	172.9	8.0
	0.041*	0.032*	0.074*	0.029*	0.016*	(0.0000)	

* STANDARD ERROR

LARGEST CHANGE = 0.150000

6864.4 288.0
(0.0000)

PARAMETER	MEAN	STN DEV
ASYMPTOTE	0.146	0.125
SLOPE	0.625	0.464
LOG(SLOPE)	-1.049	1.430
THRESHOLD	10.533	16.869

*** PHASE 1 ***

NTtest2551 Bilog Analysis of m3subj_ENG.dat
 >COMMENT This is the same data set analyzed in the R templates

ITEM STATISTICS FOR SUBTEST TEST5

ITEM	NAME	#TRIED	#RIGHT	PCT	ITEM*TEST CORRELATION		
					LOGIT/1.7	PEARSON	BISERIAL
1	ITEM0001	5011.0	231.0	4.6	1.78	0.059	0.127
2	ITEM0002	5011.0	1376.0	27.5	0.57	0.192	0.257
3	ITEM0003	5011.0	1717.0	34.3	0.38	0.220	0.284
4	ITEM0004	5011.0	1180.0	23.5	0.69	0.110	0.152
5	ITEM0005	5011.0	1070.0	21.4	0.77	0.060	0.085
6	ITEM0006	5011.0	1533.0	30.6	0.48	0.125	0.164
7	ITEM0007	5011.0	919.0	18.3	0.88	0.069	0.100
8	ITEM0008	5011.0	282.0	5.6	1.66	0.132	0.268
9	ITEM0009	5011.0	1299.0	25.9	0.62	0.141	0.191
10	ITEM0010	5011.0	1361.0	27.2	0.58	0.093	0.125
11	ITEM0011	5011.0	880.0	17.6	0.91	0.126	0.185
12	ITEM0012	5011.0	1327.0	26.5	0.60	0.036	0.048
13	ITEM0013	5011.0	339.0	6.8	1.54	0.153	0.294
14	ITEM0014	5011.0	1301.0	26.0	0.62	0.102	0.138
15	ITEM0015	5011.0	1608.0	32.1	0.44	0.036	0.046
16	ITEM0016	5011.0	14.0	0.3	3.46	0.003	0.017
17	ITEM0017	5011.0	155.0	3.1	2.03	0.092	0.226
18	ITEM0018	5011.0	660.0	13.2	1.11	0.090	0.142
19	ITEM0019	5011.0	213.0	4.3	1.83	0.130	0.288
20	ITEM0020	5011.0	871.0	17.4	0.92	0.122	0.180
21	ITEM0021	5011.0	1619.0	32.3	0.44	0.099	0.129
22	ITEM0022	5011.0	1281.0	25.6	0.63	0.163	0.221
23	ITEM0023	5011.0	1003.0	20.0	0.81	-0.004	-0.005
24	ITEM0024	5011.0	290.0	5.8	1.64	0.029	0.059
25	ITEM0025	5011.0	1333.0	26.6	0.60	0.094	0.127
26	ITEM0026	5011.0	964.0	19.2	0.84	-0.040	-0.057
27	ITEM0027	5011.0	27.0	0.5	3.07	-0.014	-0.062
28	ITEM0028	5011.0	245.0	4.9	1.75	0.092	0.194
29	ITEM0029	5011.0	983.0	19.6	0.83	0.066	0.095
30	ITEM0030	5011.0	910.0	18.2	0.89	0.081	0.118
31	ITEM0031	5011.0	1343.0	26.8	0.59	0.055	0.074
32	ITEM0032	5011.0	1349.0	26.9	0.59	-0.025	-0.034
33	ITEM0033	5011.0	978.0	19.5	0.83	0.019	0.028
34	ITEM0034	5011.0	999.0	19.9	0.82	0.046	0.066
35	ITEM0035	5011.0	909.0	18.1	0.89	0.007	0.011
36	ITEM0036	5011.0	1385.0	27.6	0.57	0.023	0.030
37	ITEM0037	5011.0	901.0	18.0	0.89	-0.010	-0.014
38	ITEM0038	5011.0	968.0	19.3	0.84	-0.018	-0.025
39	ITEM0039	5011.0	953.0	19.0	0.85	0.029	0.042
40	ITEM0040	5011.0	0.0	0.0	99.99	0.000	0.000

*** PHASE 2 ***

INTERVAL AVERAGE THETAS

***** -0.741 -0.298 0.311 0.967 1.607 2.601

1

SUBTEST TEST5 ; ITEM PARAMETERS AFTER CYCLE 45

ITEM	INTERCEPT S.E.	SLOPE S.E.	THRESHOLD S.E.	LOADING S.E.	ASYMPTOTE S.E.	CHISQ (PROB)	DF
ITEM0001	-2.668 0.465*	1.098 0.219*	2.430 0.119*	0.739 0.147*	0.154 0.016*	1345.2 (0.0000)	6.0
ITEM0002	-3.080 0.602*	1.865 0.379*	1.652 0.049*	0.881 0.179*	0.214 0.011*	504.6 (0.0000)	6.0
ITEM0003	-9.948	4.715	2.110	0.978	0.330	1479.8	6.0

	3.993*	1.983*	0.071*	0.411*	0.007*	(0.0000)	
ITEM0004	-2.154 0.418*	0.478 0.159*	4.502 0.897*	0.432 0.144*	0.209 0.016*	36.1 (0.0000)	6.0
ITEM0005	-4.584 0.980*	2.171 0.522*	2.111 0.081*	0.908 0.218*	0.191 0.007*	560.2 (0.0000)	6.0
ITEM0006	-5.545 2.026*	2.084 0.857*	2.661 0.171*	0.902 0.371*	0.300 0.007*	159.3 (0.0000)	6.0
ITEM0007	-0.890 0.033*	0.048 0.012*	18.493 4.522*	0.048 0.012*	0.016 0.008*	127.5 (0.0000)	6.0
ITEM0008	-3.206 0.217*	1.677 0.147*	1.912 0.050*	0.859 0.075*	0.004 0.002*	383.4 (0.0000)	4.0
ITEM0009	-2.205 0.401*	1.017 0.213*	2.167 0.113*	0.713 0.150*	0.207 0.015*	240.2 (0.0000)	6.0
ITEM0010	-6.594 3.069*	2.422 1.255*	2.723 0.185*	0.924 0.479*	0.268 0.007*	171.1 (0.0000)	6.0
ITEM0011	-1.881 0.294*	0.907 0.164*	2.073 0.098*	0.672 0.121*	0.097 0.017*	469.8 (0.0000)	6.0
ITEM0012	-0.581 0.023*	0.031 0.007*	18.824 4.454*	0.031 0.007*	0.014 0.007*	249.2 (0.0000)	6.0
ITEM0013	-3.642 0.336*	2.111 0.227*	1.726 0.038*	0.904 0.097*	0.006 0.002*	602.2 (0.0000)	5.0
ITEM0014	-1.356 0.273*	0.650 0.135*	2.088 0.127*	0.545 0.113*	0.148 0.032*	507.5 (0.0000)	6.0
ITEM0015	-0.414 0.020*	0.024 0.005*	17.357 4.049*	0.024 0.005*	0.014 0.007*	377.9 (0.0000)	6.0
ITEM0016	-4.142 0.484*	0.723 0.286*	5.725 1.815*	0.586 0.232*	0.002 0.001*	11.5 (0.0093)	3.0
ITEM0017	-3.003 0.173*	1.174 0.108*	2.557 0.105*	0.761 0.070*	0.003 0.001*	167.9 (0.0000)	4.0
ITEM0018	-1.164 0.051*	0.070 0.017*	16.631 4.188*	0.070 0.017*	0.019 0.009*	105.8 (0.0000)	6.0
ITEM0019	-3.249 0.223*	1.506 0.139*	2.157 0.067*	0.833 0.077*	0.004 0.002*	372.1 (0.0000)	5.0
ITEM0020	-1.858 0.276*	1.023 0.165*	1.816 0.070*	0.715 0.115*	0.080 0.017*	622.2 (0.0000)	6.0
ITEM0021	-4.631 1.358*	1.727 0.578*	2.681 0.173*	0.865 0.290*	0.315 0.007*	119.2 (0.0000)	6.0
ITEM0022	-1.284 0.274*	0.435 0.111*	2.954 0.291*	0.399 0.102*	0.153 0.037*	378.0 (0.0000)	6.0
ITEM0023	-0.775 0.024*	0.034 0.008*	22.899 5.465*	0.034 0.008*	0.010 0.005*	236.7 (0.0000)	6.0
ITEM0024	-2.306 0.106*	0.989 0.074*	2.332 0.086*	0.703 0.053*	0.003 0.002*	133.1 (0.0000)	4.0
ITEM0025	-8.598 2.696*	3.934 1.274*	2.185 0.062*	0.969 0.314*	0.254 0.006*	1165.7 (0.0000)	6.0

ITEM0026	-0.797 0.024*	0.033 0.008*	24.268 5.784*	0.033 0.008*	0.009 0.004*	289.2 (0.0000)	6.0
ITEM0027	-3.764 0.422*	0.791 0.277*	4.758 1.206*	0.620 0.218*	0.002 0.001*	15.7 (0.0035)	4.0
ITEM0028	-2.882 0.177*	1.331 0.113*	2.166 0.069*	0.799 0.068*	0.005 0.002*	274.2 (0.0000)	4.0
ITEM0029	-3.801 0.943*	1.242 0.410*	3.060 0.315*	0.779 0.257*	0.188 0.007*	53.1 (0.0000)	6.0
ITEM0030	-1.820 0.336*	0.596 0.156*	3.055 0.315*	0.512 0.134*	0.125 0.021*	208.5 (0.0000)	6.0
ITEM0031	-1.085 0.202*	0.173 0.043*	6.290 1.368*	0.170 0.042*	0.150 0.040*	103.5 (0.0000)	6.0
ITEM0032	-0.670 0.052*	0.059 0.014*	11.407 2.784*	0.059 0.014*	0.042 0.019*	50.1 (0.0000)	6.0
ITEM0033	-1.129 0.142*	0.122 0.029*	9.234 2.201*	0.121 0.029*	0.078 0.028*	56.2 (0.0000)	6.0
ITEM0034	-1.048 0.116*	0.107 0.026*	9.816 2.383*	0.106 0.025*	0.066 0.026*	97.1 (0.0000)	6.0
ITEM0035	-1.690 0.311*	0.509 0.137*	3.319 0.383*	0.454 0.122*	0.119 0.024*	183.8 (0.0000)	6.0
ITEM0036	-0.633 0.045*	0.053 0.013*	11.878 2.903*	0.053 0.013*	0.038 0.017*	85.7 (0.0000)	6.0
ITEM0037	-1.682 0.277*	0.235 0.067*	7.150 1.697*	0.229 0.066*	0.130 0.023*	33.3 (0.0000)	6.0
ITEM0038	-2.262 0.437*	0.568 0.188*	3.979 0.685*	0.494 0.163*	0.167 0.014*	13.3 (0.0387)	6.0
ITEM0039	-0.823 0.026*	0.037 0.009*	22.411 5.388*	0.037 0.009*	0.011 0.005*	233.6 (0.0000)	6.0

* STANDARD ERROR

LARGEST CHANGE = 0.150000

12223.6 219.0
(0.0000)

PARAMETER	MEAN	STN DEV
ASYMPTOTE	0.106	0.102
SLOPE	0.994	1.063
LOG(SLOPE)	-0.815	1.559
THRESHOLD	6.860	6.914

ภาคผนวก ข

ค่าความเชื่อมั่นโดยการวิเคราะห์ G – Coefficient ของแบบทดสอบวัดความสามารถทางการเรียน

แสดงค่าความเชื่อมั่น โดยการใช้ค่า G-Coefficient ของแบบทดสอบวัดความสามารถทางการเรียนวิชาภาษาไทยเมื่อยังไม่ได้ข้อสอบที่พบว่าทำหน้าที่ต่างกัน

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GGGGGGGGGG  EEEEEEEEEEE  NN  00000000  VV  VV  AAAAAAAAAA
GGGGGGGGGGGG  EEEEEEEEEEE  NN  0000000000  VV  VV  AAAAAAAAAA
GG  EE  NNNN  NN  00  00  VV  VV  AA  AA
GG  EE  NN  NN  00  00  VV  VV  AA  AA
GG  EE  NN  NN  00  00  VV  VV  AA  AA
GG  EE  NN  NN  00  00  VV  VV  AA  AA
GG  EE  NN  NN  00  00  VV  VV  AA  AA
GG  EEEEEEE  NN  NN  00  00  VV  VV  AA  AA
GG  EEEEEEE  NN  NNNN  00  00  VV  VV  AAAAAAAAAA
GG  GGGG  EE  NN  00  00  VV  VV  AAAAAAAAAA
GG  GGGG  EE  NN  00  00  VV  VV  AA  AA
GG  GG  EE  NN  00  00  VV  VV  AA  AA
GG  GG  EE  NN  00  00  VV  V  V  AA  AA
GG  GG  EE  NN  00  00  VVV  VVV  AA  AA
GGGGGGGGGG  EEEEEEEEEEE  NN  0000000000  VVVV  VVV  AA  AA
GGGGGGGGGG  EEEEEEEEEEE  NN  00000000  VV  VV  AA  AA
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A GENERAL PURPOSE ANALYSIS OF VARIANCE SYSTEM

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GENOVA IS A FORTRAN 77 PROGRAM FOR ANALYSIS OF VARIANCE
AND GENERALIZABILITY ANALYSES WITH BALANCED DESIGNS

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VERSION 3.1

RECORD #	3	0.00000 0.00000	0.00000 0.00000	0.00000 0.20000	0.00000 1.00000	1.00000 0.00000	1.00000 0.00000	0.00000 0.00000	0.00000 0.00000
RECORD #	4	0.00000 0.00000	1.00000 1.00000	0.00000 0.20000	0.00000 0.00000	0.00000 0.00000	0.00000 0.00000	0.00000 0.00000	0.00000 0.00000
RECORD #	5	0.00000 1.00000	0.00000 1.00000	0.00000 0.50000	1.00000 1.00000	1.00000 0.00000	0.00000 0.00000	0.00000 0.00000	1.00000 0.00000
RECORD #	6	0.00000 0.00000	0.00000 1.00000	0.00000 0.30000	1.00000 0.00000	1.00000 0.00000	0.00000 0.00000	0.00000 0.00000	0.00000 0.00000
RECORD #	7	1.00000 0.00000	0.00000 0.00000	0.00000 0.30000	0.00000 1.00000	1.00000 1.00000	0.00000 0.00000	0.00000 0.00000	1.00000 0.00000
RECORD #	8	1.00000 0.00000	0.00000 0.00000	1.00000 0.60000	1.00000 0.00000	1.00000 0.00000	1.00000 0.00000	1.00000 0.00000	0.00000 0.00000
RECORD #	9	0.00000 1.00000	0.00000 0.00000	0.00000 0.40000	0.00000 1.00000	1.00000 0.00000	0.00000 0.00000	1.00000 0.00000	1.00000 1.00000
RECORD #	10	1.00000 0.00000	0.00000 0.00000	1.00000 0.30000	0.00000 1.00000	0.00000 1.00000	0.00000 1.00000	0.00000 1.00000	1.00000 1.00000
RECORD #	21	1.00000 1.00000	0.00000 1.00000	1.00000 0.90000	1.00000 1.00000	1.00000 1.00000	1.00000 1.00000	1.00000 1.00000	1.00000 1.00000
RECORD #	22	0.00000 1.00000	0.00000 1.00000	0.00000 0.40000	0.00000 1.00000	1.00000 1.00000	1.00000 1.00000	0.00000 0.00000	0.00000 1.00000
RECORD #	23	0.00000 1.00000	0.00000 1.00000	0.00000 0.60000	1.00000 1.00000	1.00000 1.00000	1.00000 1.00000	0.00000 1.00000	1.00000 1.00000
RECORD #	24	0.00000 1.00000	1.00000 1.00000	1.00000 0.90000	1.00000 1.00000	1.00000 1.00000	1.00000 1.00000	1.00000 0.00000	1.00000 1.00000
RECORD #	25	0.00000 1.00000	0.00000 0.00000	0.00000 0.20000	0.00000 1.00000	0.00000 0.00000	0.00000 0.00000	0.00000 0.00000	1.00000 1.00000
RECORD #	26	0.00000 1.00000	0.00000 1.00000	0.00000 0.50000	1.00000 1.00000	1.00000 1.00000	0.00000 0.00000	0.00000 0.00000	1.00000 1.00000
RECORD #	27	0.00000 1.00000	1.00000 1.00000	1.00000 0.70000	1.00000 1.00000	1.00000 0.00000	0.00000 1.00000	1.00000 1.00000	0.00000 0.00000

GENOVA VERSION 3.1
G STUDY

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INPUT RECORD LISTING WITH RECORD MEANS

RECORD #	28	0.00000	0.00000	0.00000	1.00000	1.00000	0.00000	1.00000	1.00000
		0.00000	1.00000	0.50000					
RECORD #	29	1.00000	0.00000	0.00000	1.00000	1.00000	1.00000	0.00000	0.00000
		0.00000	1.00000	0.50000					
RECORD #	30	1.00000	0.00000	1.00000	1.00000	1.00000	1.00000	0.00000	1.00000
		1.00000	1.00000	0.80000					

GENOVA VERSION 3.1
G STUDY

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CELL MEAN SCORES

*** GRAND MEAN = 0.4566667 ***

MEAN SCORES FOR EFFECT: I SUBSCRIPT NOTATION: (I)

(1) =	0.366667	(2) =	0.100000	(3) =	0.433333	(4) =	0.600000
(5) =	0.700000	(6) =	0.400000	(7) =	0.400000	(8) =	0.466667
(9) =	0.533333	(10) =	0.566667				

GENOVA VERSION 3.1
G STUDY

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ANOVA TABLE

(** = INFINITE) P I
SAMPLE SIZE 30 10
UNIVERSE SIZE ***

EFFECT	DEGREES OF FREEDOM	SUMS OF SQUARES FOR MEAN SCORES	SUMS OF SQUARES FOR SCORE EFFECTS	MEAN SQUARES	F STATISTIC	(QF = QUASI F RATIO) F-TEST DEGREES OF FREEDOM
					NUMERATOR	DENOMINATOR

VARIANCE COMPONENTS IN TERMS OF G STUDY UNIVERSE (OF ADMISSIBLE OBSERVATIONS) SIZES				VARIANCE COMPONENTS IN TERMS OF D STUDY UNIVERSE (OF GENERALIZATION) SIZES			
VARIANCE COMPONENTS FOR SINGLE OBSERVATIONS		VARIANCE COMPONENTS FOR MEAN SCORES		VARIANCE COMPONENTS FOR SINGLE OBSERVATIONS		VARIANCE COMPONENTS FOR MEAN SCORES	
EFFECT	FINITE UNIVERSE COR-	D STUDY SAMPLING FRE-	ESTIMATES	FINITE UNIVERSE COR-	D STUDY SAMPLING FRE-	ESTIMATES	STANDARD ERRORS
P	0.02151	1.0000	0.02151	0.02151	1.0000	0.02151	0.01096
I	0.01967	1.0000	0.00066	0.01967	1.0000	0.00066	0.00038
PI	0.21033	1.0000	0.00701	0.21033	1.0000	0.00701	0.00061

QFM = QUADRATIC FORM

VARIANCE COMPONENTS FOR SINGLE OBSERVATIONS		VARIANCE COMPONENTS FOR MEAN SCORES	
EFFECT	FINITE UNIVERSE COR-	D STUDY SAMPLING FRE-	ESTIMATES
P	0.02151	1.0000	0.02151
I	0.01967	1.0000	0.00066
PI	0.21033	1.0000	0.00701

NOTE: SIGNAL/NOISE RATIOS ARE IN PARENTHESES
GENOVA VERSION 3.1
D STUDY

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D STUDY DESIGN NUMBER 001-001

VARIANCE - COVARIANCE MATRIX FOR ESTIMATED VARIANCE COMPONENTS (FOR MEAN SCORES) IN UNIVERSE OF GENERALIZATION (W)

P	I	PI
0.0001201	0.0000001	0.0000004
0.0000000	0.0000000	0.0000000
-0.0000011	0.0000000	0.0000000

GENERALIZABILITY COEFFICIENT = 0.75415 (3.06758)
PHI = 0.73721 (2.80526)

แสดงค่าความเชื่อมั่น โดยการใช้ G-Coefficient ของแบบทดสอบวัดความสามารถทางการเรียนวิชาภาษาไทยเมื่อตัดข้อสอบที่พบว่าทำหน้าที่ย่างกัน

GGGGGGGGG	EEEEEEEEEE	NN	NN	OOOOOOOO	VV	VV	AAAAAAAAA
GGGGGGGGGG	EEEEEEEEEE	NNN	NN	OOOOOOOOO	VV	VV	AAAAAAAAAAA
GG	EE	NNN	NN	OO	VV	VV	AA
GG	EE	NN	NN	OO	VV	VV	AA
GG	EE	NN	NN	OO	VV	VV	AA
GG	EE	NN	NN	OO	VV	VV	AA
GG	EE	NN	NN	OO	VV	VV	AA
GG	EEEEEE	NN	NN	OO	VV	VV	AA
GG	EEEEEE	NN	NNN	OO	VV	VV	AA
GG	EEEEEE	NN	NNN	OO	VV	VV	AAAAAAAAA
GG	GGGG	NN	NN	OO	VV	VV	AAAAAAAAAAA
GG	GGGG	NN	NN	OO	VV	VV	AA
GG	GG	NN	NN	OO	VV	VV	AA
GG	GG	NN	NN	OO	VV	VV	AA
GG	GG	NN	NN	OO	V	V	AA
GG	GG	NN	NN	OO	VVV	VVV	AA
GGGGGGGGGG	EEEEEEEEEE	NN	NN	OOOOOOOOO	VVVV	VVVV	AA
GGGGGGGGGG	EEEEEEEEEE	NN	NN	OOOOOOOO	VV	VV	AA

A GENERAL PURPOSE ANALYSIS OF VARIANCE SYSTEM

GENOVA IS A FORTRAN 77 PROGRAM FOR ANALYSIS OF VARIANCE
AND GENERALIZABILITY ANALYSES WITH BALANCED DESIGNS

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Iowa City, Iowa 52242

VERSION 3.1

RECORD #	3	0.00000 0.00000	0.00000 0.11111	0.00000	0.00000	1.00000	0.00000	0.00000	0.00000
RECORD #	4	0.00000 1.00000	1.00000 0.22222	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
RECORD #	5	0.00000 1.00000	0.00000 0.44444	0.00000	1.00000	0.00000	0.00000	1.00000	1.00000
RECORD #	6	0.00000 1.00000	0.00000 0.22222	0.00000	1.00000	0.00000	0.00000	0.00000	0.00000
RECORD #	7	1.00000 0.00000	0.00000 0.22222	0.00000	0.00000	0.00000	0.00000	1.00000	0.00000
RECORD #	8	1.00000 0.00000	0.00000 0.55556	1.00000	1.00000	1.00000	1.00000	0.00000	0.00000
RECORD #	9	0.00000 0.00000	0.00000 0.33333	0.00000	0.00000	0.00000	1.00000	1.00000	1.00000
RECORD #	10	1.00000 0.00000	0.00000 0.33333	1.00000	0.00000	0.00000	0.00000	1.00000	0.00000
RECORD #	21	1.00000 1.00000	0.00000 0.88889	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
RECORD #	22	0.00000 1.00000	0.00000 0.33333	0.00000	0.00000	1.00000	0.00000	0.00000	1.00000
RECORD #	23	0.00000 1.00000	0.00000 0.55556	0.00000	1.00000	1.00000	0.00000	1.00000	1.00000
RECORD #	24	0.00000 1.00000	1.00000 0.88889	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
RECORD #	25	0.00000 0.00000	0.00000 0.22222	0.00000	0.00000	0.00000	0.00000	1.00000	1.00000
RECORD #	26	0.00000 1.00000	0.00000 0.44444	0.00000	1.00000	0.00000	0.00000	1.00000	1.00000
RECORD #	27	0.00000 1.00000	1.00000 0.66667	1.00000	1.00000	0.00000	1.00000	0.00000	1.00000

INPUT RECORD LISTING WITH RECORD MEANS

RECORD #	28	0.00000	0.00000	0.00000	1.00000	0.00000	1.00000	0.00000
		1.00000	0.44444					
RECORD #	29	1.00000	0.00000	0.00000	1.00000	1.00000	0.00000	0.00000
		1.00000	0.44444					
RECORD #	30	1.00000	0.00000	1.00000	1.00000	0.00000	1.00000	1.00000
		1.00000	0.77778					

CELL MEAN SCORES

*** GRAND MEAN = 0.4296296 ***

MEAN SCORES FOR EFFECT: I

SUBSCRIPT NOTATION: (I)

(1) =	0.366667	(2) =	0.100000	(3) =	0.433333	(4) =	0.600000
(5) =	0.400000	(6) =	0.400000	(7) =	0.466667	(8) =	0.533333
(9) =	0.566667						

ANOVA TABLE

(** = INFINITE) P I
SAMPLE SIZE 30 9
UNIVERSE SIZE *** ****

EFFECT	DEGREES OF FREEDOM	SUMS OF SQUARES FOR MEAN SCORES	SUMS OF SQUARES FOR SCORE EFFECTS	MEAN SQUARES	F STATISTIC	(QF = QUASI F RATIO) F-TEST DEGREES OF FREEDOM NUMERATOR DENOMINATOR

P	29	60.88889	11.05185	0.38110	1.77250	29	232
I	8	55.06667	5.22963	0.65370	3.04039	8	232
PI	232	116.00000	49.88148	0.21501			
MEAN		49.83704					
TOTAL	269		66.16296				

NOTE: FOR GENERALIZABILITY ANALYSES, F-STATISTICS SHOULD BE IGNORED

GENOVA VERSION 3.1

G STUDY

PAGE 7

G STUDY RESULTS

(** = INFINITE)	P	I	
SAMPLE SIZE	30	9	
UNIVERSE SIZE	***	***	

QFM = QUADRATIC FORM

EFFECT	DEGREES OF FREEDOM	MODEL USING ALGORITHM	VARIANCE USING EMS EQUATIONS	COMPONENTS STANDARD ERROR
P	29	0.0184547	0.0184547	0.0109799
I	8	0.0146232	0.0146232	0.0097673
PI	232	0.2150064	0.2150064	0.0198773

NOTE: THE "ALGORITHM" AND "EMS" ESTIMATED VARIANCE COMPONENTS WILL BE IDENTICAL IF THERE ARE NO NEGATIVE ESTIMATES

GENOVA VERSION 3.1

G STUDY

PAGE 8

EXPECTED MEAN SQUARE EQUATIONS

(** = INFINITE)	P	I	
SAMPLE SIZE	30	9	
UNIVERSE SIZE	***	***	

$$\text{EMS}(P) = 1.00 * \text{VC}(PI) + 9.00 * \text{VC}(P)$$

$$\text{EMS}(I) = 1.00 * \text{VC}(PI) + 30.00 * \text{VC}(I)$$

VARIANCE COMPONENTS IN TERMS OF G STUDY UNIVERSE (OF ADMISSIBLE OBSERVATIONS) SIZES				VARIANCE COMPONENTS IN TERMS OF D STUDY UNIVERSE (OF GENERALIZATION) SIZES			
VARIANCE COMPONENTS FOR MEAN SCORES				VARIANCE COMPONENTS FOR MEAN SCORES			
VARIANCE COMPONENTS FOR SINGLE OBSERVATIONS	FINITE UNIVERSE COR-	D STUDY SAMPLING FRE-	STANDARD ERRORS	VARIANCE COMPONENTS FOR SINGLE OBSERVATIONS	FINITE UNIVERSE COR-	D STUDY SAMPLING FRE-	STANDARD ERRORS
EFFECT	RECTIONS	QUENCIES	ESTIMATES	RECTIONS	QUENCIES	ESTIMATES	ERRORS
P	0.01845	1.0000	1	0.01845	1.0000	1	0.01845
I	0.01462	1.0000	30	0.00049	1.0000	30	0.00049
PI	0.21501	1.0000	30	0.00717	1.0000	30	0.00717

QFM = QUADRATIC FORM

STANDARD
ERROR OF
VARIANCE
DEVIATION

UNIVERSE SCORE 0.01845 0.13585 0.01098
 EXPECTED OBSERVED SCORE 0.02562 0.16007 0.01087
 LOWER CASE DELTA 0.00717 0.08466 0.00066
 UPPER CASE DELTA 0.00765 0.08749 0.00072
 MEAN 0.00134 0.03663

GENERALIZABILITY COEFFICIENT = 0.72028 (2.57499)
 PHI = 0.70683 (2.41101)

NOTE: SIGNAL/NOISE RATIOS ARE IN PARENTHESES
 GENOVA VERSION 3.1
 D STUDY

PAGE 13

D STUDY DESIGN NUMBER 001-001

VARIANCE - COVARIANCE MATRIX FOR ESTIMATED VARIANCE COMPONENTS (FOR MEAN SCORES) IN UNIVERSE OF GENERALIZATION (W)

P	I	PI
P	0.0001206	
I	0.0000000	0.0000001
PI	-0.00000015	0.0000000

แสดงค่าความเชื่อมั่น โดยการวิเคราะห์ G-Coefficient ของแบบทดสอบวัดความสามารถทางการเรียนวิชาคณิตศาสตร์เบื้องต้นที่ยังต้องสอบที่พบว่าทำหน้าที่ต่างกัน

```
GGGGGGGGG EEEEEEEEE NN NN OOOOOOO VV VV AAAAAAAAA
GGGGGGGGGG EEEEEEEEE NNN NN OOOOOOOOO VV VV AAAAAAAAA
GG G EE EEEEEEEEE NNNN NN OO OO VV AA AA
GG EE NN NN NNN NN NN OO OO VV AA AA
GG EE NN NN NN NN NN OO OO VV AA AA
GG EE NN NN NN NN NN OO OO VV AA AA
GG EE NN NN NN NN NN OO OO VV AA AA
GG EEEEEEE NN NN NN NN NN OO OO VV AA AA
GG EEEEEEE NNNN NN OO VV VV AAAAAAAAA
GG EE NN NN NN NN NN OO VV VV AAAAAAAAA
GG EE NN NN NN NN NN OO VV VV AA AA
GG EE NN NN NN NN NN OO V V AA AA
GG EE NN NN NN NN NN OO VVVV AA AA
GGGGGGGGGG EEEEEEEEE NN NN OOOOOOOOO VVVV AA AA
GGGGGGGGGG EEEEEEEEE NN NN OOOOOOO VV AA AA
```

A GENERAL PURPOSE ANALYSIS OF VARIANCE SYSTEM

GENOVA IS A FORTRAN 77 PROGRAM FOR ANALYSIS OF VARIANCE
AND GENERALIZABILITY ANALYSES WITH BALANCED DESIGNS

AUTHORS

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Vice President Applications and Database Services
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Philadelphia, PA 19104

Robert L. Brennan, Ed.D.
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University of Iowa
Iowa City, Iowa 52242

RECORD #	3	0.00000 0.00000	0.00000 0.00000	0.00000 0.20000	1.00000	1.00000	0.00000	0.00000	0.00000
RECORD #	4	0.00000 0.00000	1.00000 0.00000	0.00000 0.30000	0.00000	1.00000	0.00000	0.00000	1.00000
RECORD #	5	0.00000 0.00000	0.00000 0.00000	0.00000 0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
RECORD #	6	0.00000 1.00000	0.00000 0.00000	0.00000 0.20000	0.00000	0.00000	0.00000	1.00000	0.00000
RECORD #	7	1.00000 1.00000	0.00000 0.00000	0.00000 0.20000	0.00000	0.00000	0.00000	0.00000	0.00000
RECORD #	8	0.00000 0.00000	0.00000 1.00000	0.00000 0.10000	0.00000	0.00000	0.00000	0.00000	0.00000
RECORD #	9	0.00000 0.00000	0.00000 0.00000	0.00000 0.20000	0.00000	1.00000	0.00000	0.00000	1.00000
RECORD #	10	0.00000 1.00000	1.00000 0.00000	1.00000 0.30000	0.00000	0.00000	0.00000	0.00000	0.00000
RECORD #	21	0.00000 1.00000	1.00000 1.00000	1.00000 0.70000	1.00000	1.00000	0.00000	1.00000	0.00000
RECORD #	22	0.00000 0.00000	0.00000 0.00000	1.00000 0.10000	0.00000	0.00000	0.00000	0.00000	0.00000
RECORD #	23	0.00000 0.00000	0.00000 0.00000	0.00000 0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
RECORD #	24	0.00000 0.00000	1.00000 1.00000	1.00000 0.60000	1.00000	0.00000	1.00000	0.00000	1.00000
RECORD #	25	0.00000 1.00000	0.00000 0.00000	1.00000 0.20000	0.00000	0.00000	0.00000	0.00000	0.00000
RECORD #	26	1.00000 1.00000	0.00000 0.00000	0.00000 0.30000	1.00000	0.00000	0.00000	0.00000	0.00000
RECORD #	27	0.00000 1.00000	0.00000 0.00000	0.00000 0.10000	0.00000	0.00000	0.00000	0.00000	0.00000

GENOVA VERSION 3.1
G STUDY

INPUT RECORD LISTING WITH RECORD MEANS

RECORD #	28	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
RECORD #	29	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
RECORD #	30	1.00000	1.00000	0.00000	1.00000	0.00000	1.00000	0.00000	0.00000
		0.00000	0.00000	0.40000	0.00000	0.00000	0.00000	0.00000	0.00000

GENOVA VERSION 3.1
G STUDY

CELL MEAN SCORES

*** GRAND MEAN = 0.223333 ***

MEAN SCORES FOR EFFECT: I SUBSCRIPT NOTATION: (I)

(1) =	0.200000	(2) =	0.333333	(3) =	0.233333	(4) =	0.266667
(5) =	0.200000	(6) =	0.133333	(7) =	0.166667	(8) =	0.166667
(9) =	0.366667	(10) =	0.166667				

GENOVA VERSION 3.1
G STUDY

ANOVA TABLE

(** = INFINITE)	P	I
SAMPLE SIZE	30	10
UNIVERSE SIZE	***	***

EFFECT	DEGREES OF FREEDOM	SUMS OF SQUARES	MEAN SQUARES	F-STATISTIC	QUASI F RATIO (QF)	F-TEST DEGREES OF FREEDOM	NUMERATOR	DENOMINATOR
--------	--------------------	-----------------	--------------	-------------	--------------------	---------------------------	-----------	-------------

P	29	23.90000	8.93667	0.30816	1.93823	29	261
I	9	16.56667	1.60333	0.47815	1.12049	9	261
PI	261	67.00000	41.49667	0.15899			
MEAN		14.96333					
TOTAL	299		52.03667				

NOTE: FOR GENERALIZABILITY ANALYSES, F-STATISTICS SHOULD BE IGNORED

GENOVA VERSION 3.1

G STUDY

PAGE 7

G STUDY RESULTS

(** = INFINITE) P I
SAMPLE SIZE 30 10
UNIVERSE SIZE ***
QFM = QUADRATIC FORM

EFFECT	DEGREES OF FREEDOM	MODEL USING ALGORITHM	VARIANCE USING EMS EQUATIONS	COMPONENTS STANDARD ERROR
P	29	0.0149170	0.0149170	0.0079491
I	9	0.0006386	0.0006386	0.0025739
PI	261	0.1589911	0.1589911	0.0138647

NOTE: THE "ALGORITHM" AND "EMS" ESTIMATED VARIANCE COMPONENTS WILL BE IDENTICAL IF THERE ARE NO NEGATIVE ESTIMATES

GENOVA VERSION 3.1

G STUDY

PAGE 8

EXPECTED MEAN SQUARE EQUATIONS

(** = INFINITE) P I
SAMPLE SIZE 30 10
UNIVERSE SIZE ***

$$\text{EMS}(P) = 1.00 * \text{VC}(PI) + 10.00 * \text{VC}(P)$$

EMS(I) = 1.00*VC(PI) + 30.00*VC(I)
EMS(PI) = 1.00*VC(PI)
GENOVA VERSION 3.1
G STUDY

PAGE 9

VARIANCE - COVARIANCE MATRIX FOR ESTIMATED VARIANCE COMPONENTS (V)

	P	I	PI
P	0.0000632		
I	0.0000006	0.0000066	
PI	-0.0000192	-0.0000064	0.0001922

GENOVA VERSION 3.1
G STUDY

PAGE 10

CORRELATION MATRIX FOR ESTIMATED VARIANCE COMPONENTS

	P	I	PI
P	1.0000000		
I	0.0313172	1.0000000	
PI	-0.1744173	-0.1795535	1.0000000

GENOVA VERSION 3.1

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CONTROL CARD INPUT LISTING

COLUMN 11111111222222223333333344444444555555556666666777777778
1234567890123456789012345678901234567890123456789012345678901234567890
COMMENT WE BEGIN WITH D-STUDY OF PXI DESIGN
DSTUDY
DEFECT \$ P
DEFECT I 30
ENDDSTUDY

D STUDY DESIGN NUMBER 001-001

OBJECT OF MEASUREMENT : P FACETS : I
G STUDY POPULATION SIZE : INFINITE G STUDY UNIVERSE SIZES : INFINITE
D STUDY POPULATION SIZE : INFINITE D STUDY UNIVERSE SIZES : INFINITE
D STUDY SAMPLE SIZE : 30 D STUDY SAMPLE SIZES : 30

VARIANCE COMPONENTS IN TERMS OF G STUDY UNIVERSE (OF ADMISSIBLE OBSERVATIONS) SIZES									
VARIANCE COMPONENTS FOR MEAN SCORES					VARIANCE COMPONENTS FOR MEAN SCORES				
VARIANCE COMPONENTS FOR SINGLE OBSERVATIONS	FINITE UNIVERSE COR-	D STUDY SAMPLING FRE-	RECTIONS QUENCIES	ESTIMATES	VARIANCE COMPONENTS FOR SINGLE OBSERVATIONS	FINITE UNIVERSE COR-	D STUDY SAMPLING FRE-	RECTIONS QUENCIES	ESTIMATES
P	0.01492	1.0000	1	0.01492	0.00795	0.01492	1.0000	1	0.01492
I	0.00064	1.0000	30	0.00064	0.00009	0.00064	1.0000	30	0.00009
PI	0.15899	1.0000	30	0.00530	0.00046	0.15899	1.0000	30	0.00530

QFM = QUADRATIC FORM

VARIANCE COMPONENTS IN TERMS OF G STUDY UNIVERSE (OF GENERALIZATION) SIZES					VARIANCE COMPONENTS FOR MEAN SCORES				
VARIANCE COMPONENTS FOR MEAN SCORES					VARIANCE COMPONENTS FOR MEAN SCORES				
VARIANCE COMPONENTS FOR SINGLE OBSERVATIONS	FINITE UNIVERSE COR-	D STUDY SAMPLING FRE-	RECTIONS QUENCIES	ESTIMATES	VARIANCE COMPONENTS FOR SINGLE OBSERVATIONS	FINITE UNIVERSE COR-	D STUDY SAMPLING FRE-	RECTIONS QUENCIES	ESTIMATES
UNIVERSE SCORE	0.01492	1.0000	1	0.01492	0.00795	0.01492	1.0000	1	0.01492
EXPECTED OBSERVED SCORE	0.02022	1.0000	30	0.00064	0.00009	0.00064	1.0000	30	0.00009
LOWER CASE DELTA	0.00530	1.0000	30	0.00046	0.00046	0.15899	1.0000	30	0.00530
UPPER CASE DELTA	0.00532	1.0000	30	0.00046	0.00046	0.15899	1.0000	30	0.00530
MEAN	0.00070	1.0000	30	0.00046	0.00046	0.15899	1.0000	30	0.00530

NOTE: SIGNAL/NOISE RATIOS ARE IN PARENTHESES

D STUDY DESIGN NUMBER 001-001

แสดงค่าความเชื่อมั่น โดยการวิเคราะห์ G - Coefficient ของแบบทดสอบวัดความสามารถทางการเรียนวิชาคณิตศาสตร์ไม่ตัดข้อสอบที่พบว่าทำหน้าที่ย่างกัน

```
GGGGGGGGGG EEEEEEEEEEE NN NN 00000000 VV VV AAAAAAAAAA
GGGGGGGGGGGG EEEEEEEEEEE NNN NN 0000000000 VV VV AAAAAAAAAA
GG EE EEEEEEEEEEE NNNN NN 00 00 00 VV VV AA AA
GG EE NN NN NN NN 00 00 00 VV VV AA AA
GG EE NN NN NN NN 00 00 00 VV VV AA AA
GG EE NN NN NN NN 00 00 00 VV VV AA AA
GG EE NN NN NN NN 00 00 00 VV VV AA AA
GG EEEEEEEEEEE NN NN 00 00 00 VV VV AA AA
GG EEEEEEEEEEE NNNN NN 00 00 00 VV VV AAAAAAAAAA
GG EEEEEEEEEEE NNNN NN 00 00 00 VV VV AAAAAAAAAA
GG EE NN NN NN NN 00 00 00 VV VV AA AA
GG EE NN NN NN NN 00 00 00 VV VV AA AA
GG EE NN NN NN NN 00 00 00 VV VV AA AA
GG EE NN NN NN NN 00 00 00 VV VV AA AA
GG EEEEEEEEEEE NN NN 00 00 00 VVVV AA AA
GGGGGGGGGGGG EEEEEEEEEEE NN NN 0000000000 VVVV AA AA
GGGGGGGGGGGG EEEEEEEEEEE NN NN 00000000 VV AA AA
```

A GENERAL PURPOSE ANALYSIS OF VARIANCE SYSTEM

GENOVA IS A FORTRAN 77 PROGRAM FOR ANALYSIS OF VARIANCE
AND GENERALIZABILITY ANALYSES WITH BALANCED DESIGNS

AUTHORS

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VERSION 3.1

INPUT RECORD LISTING WITH RECORD MEANS

RECORD #	28	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
RECORD #	29	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
RECORD #	30	1.00000	0.00000	1.00000	0.00000	1.00000	0.00000	0.00000
		0.00000	0.44444	0.00000	0.00000	0.00000	0.00000	0.00000

CELL MEAN SCORES

-

*** GRAND MEAN = 0.2074074 ***

MEAN SCORES FOR EFFECT: I SUBSCRIPT NOTATION: (I)

(1) =	0.200000	(2) =	0.333333	(3) =	0.233333	(4) =	0.266667
(5) =	0.200000	(6) =	0.133333	(7) =	0.166667	(8) =	0.166667
(9) =	0.166667						

ANOVA TABLE

(** = INFINITE)	P	I
SAMPLE SIZE	30	9
UNIVERSE SIZE	***	***

EFFECT	DEGREES OF FREEDOM	SUMS OF SQUARES FOR MEAN SCORES	SUMS OF SQUARES FOR SCORE EFFECTS	MEAN SQUARES	F STATISTIC	(QF = QUASI F RATIO)	F-TEST DEGREES OF FREEDOM	NUMERATOR	DENOMINATOR
--------	--------------------	---------------------------------	-----------------------------------	--------------	-------------	----------------------	---------------------------	-----------	-------------

P	29	20.66667	9.05185	0.31213	2.10418	29	232
I	8	12.53333	0.91852	0.11481	0.77400	8	232
PI	232	56.00000	34.41481	0.14834			
MEAN		11.61481					
TOTAL	269		44.38519				

NOTE: FOR GENERALIZABILITY ANALYSES, F-STATISTICS SHOULD BE IGNORED
GENOVA VERSION 3.1
G STUDY

G STUDY RESULTS

(** = INFINITE) P I
SAMPLE SIZE 30 9
UNIVERSE SIZE *** **** QFM = QUADRATIC FORM

		MODEL VARIANCE COMPONENTS			
EFFECT	DEGREES OF FREEDOM	USING ALGORITHM	USING EMS EQUATIONS	STANDARD ERROR	
P	29	0.0181992	0.0181992	0.0089399	
I	8	(0.0)	(0.0)	0.0017716	
PI	232	0.1483397	0.1483397	0.0137140	

NOTE: THE "ALGORITHM" AND "EMS" ESTIMATED VARIANCE COMPONENTS WILL BE IDENTICAL IF THERE ARE NO NEGATIVE ESTIMATES

GENOVA VERSION 3.1
G STUDY

EXPECTED MEAN SQUARE EQUATIONS

(** = INFINITE) P I
SAMPLE SIZE 30 9
UNIVERSE SIZE *** ****

EMS (P) = 1.00*VC(PI) + 9.00*VC(P)

VARIANCE COMPONENTS IN TERMS OF G STUDY UNIVERSE (OF ADMISSIBLE OBSERVATIONS) SIZES				VARIANCE COMPONENTS IN TERMS OF D STUDY UNIVERSE (OF GENERALIZATION) SIZES			
VARIANCE COMPONENTS FOR MEAN SCORES				VARIANCE COMPONENTS FOR MEAN SCORES			
VARIANCE COMPONENTS FOR SINGLE OBSERVATIONS	FINITE UNIVERSE COR-	D STUDY SAMPLING FRE-	STANDARD ERRORS	VARIANCE COMPONENTS FOR SINGLE OBSERVATIONS	FINITE UNIVERSE COR-	D STUDY SAMPLING FRE-	STANDARD ERRORS
EFFECT	RECTIONS	QUENCIES	ESTIMATES	RECTIONS	QUENCIES	ESTIMATES	STANDARD ERRORS
P	0.01820	1.0000	1	0.01820	1.0000	1	0.01820
I	0.00000E+00	1.0000	30	0.00000E+00	1.0000	30	0.00000E+00
PI	0.14834	1.0000	30	0.00046	1.0000	30	0.00494

QFM = QUADRATIC FORM

STANDARD ERROR-OF VARIANCE		STANDARD ERROR-OF VARIANCE	
UNIVERSE SCORE	0.01820	0.13490	0.00894
EXPECTED OBSERVED SCORE	0.02314	0.15213	0.00887
LOWER CASE DELTA	0.00494	0.07032	0.00046
UPPER CASE DELTA	0.00494	0.07032	0.00045
MEAN	0.00077	0.02778	

GENERALIZABILITY COEFFICIENT = 0.78635 (3.68059)
PHI = 0.78635 (3.68059)

NOTE: SIGNAL/NOISE RATIOS ARE IN PARENTHESES

GENOVA VERSION 3.1
D STUDY

PAGE 13

D STUDY DESIGN NUMBER 001-001

VARIANCE - COVARIANCE MATRIX FOR ESTIMATED VARIANCE COMPONENTS (FOR MEAN SCORES) IN UNIVERSE OF GENERALIZATION (W)

P	I	PI
P	0.0000799	
I	0.0000000	0.0000000
PI	-0.0000007	0.0000000

UNIVERSE SCORE 0.01820 0.13490 0.00894
EXPECTED OBSERVED SCORE 0.02314 0.15213 0.00887
LOWER CASE DELTA 0.00494 0.07032 0.00046
UPPER CASE DELTA 0.00494 0.07032 0.00045
MEAN 0.00077 0.02778

GENERALIZABILITY COEFFICIENT = 0.78635 (3.68059)
PHI = 0.78635 (3.68059)

NOTE: SIGNAL/NOISE RATIOS ARE IN PARENTHESES
GENOVA VERSION 3.1
D STUDY

PAGE 16

D STUDY DESIGN NUMBER 001-001

VARIANCE - COVARIANCE MATRIX FOR ESTIMATED VARIANCE COMPONENTS (FOR MEAN SCORES) IN UNIVERSE OF GENERALIZATION (W)

P	I	PI
0.0000799		
0.0000000	0.0000000	
-0.0000007	0.0000000	0.0000002

GENOVA VERSION 3.1

CONTROL CARD INPUT LISTING

COLUMN 1111111122222233333333334444445555556666667777777778
123456789012345678901234567890123456789012345678901234567890
FINISH

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แสดงค่าความเชื่อมั่น โดยการวิเคราะห์ G-Coefficient ของแบบทดสอบวัดความสามารถทางการเรียน วิชาวิทยาศาสตร์เมื่อไม่ได้ข้อสอบที่พบว่าทำหน้าต่างกัน

```
GGGGGGGGG EEEEEEEEE NN NN 0000000 VV VV AAAAAAAAAA
GGGGGGGGGG EEEEEEEEE NNN NN 000000000 VV VV AAAAAAAAAA
GG EE NN NN NNNN NN 00 00 00 VV VV AA AA
GG EE NN NN NN NN NN 00 00 00 VV VV AA AA
GG EE NN NN NN NN NN 00 00 00 VV VV AA AA
GG EE NN NN NN NN NN 00 00 00 VV VV AA AA
GG EEEEEEE EEEEEEE NN NN 00 00 00 VV VV AA AA
GG EEEEEEE EEEEEEE NNNN 00 00 00 VV VV AAAAAAAAAA
GG GG EEEEEEE EEEEEEE NN NN 00 00 00 VV VV AAAAAAAAAA
GG GG EE NN NN NN NN 00 00 00 VV VV AA AA
GG GG EE NN NN NN NN 00 00 00 VV VV AA AA
GG GG EE NN NN NN NN 00 00 00 V V V AA AA
GG GG EE NN NN NN NN 00 00 00 VVVV AA AA
GGGGGGGGGG EEEEEEEEE NN NN 000000000 VVVV AA AA
GGGGGGGGGG EEEEEEEEE NN NN 0000000 VV AA AA
```

A GENERAL PURPOSE ANALYSIS OF VARIANCE SYSTEM

GENOVA IS A FORTRAN 77 PROGRAM FOR ANALYSIS OF VARIANCE
AND GENERALIZABILITY ANALYSES WITH BALANCED DESIGNS

AUTHORS

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VERSION 3.1
January, 2001

RECORD #	3	0.00000 0.00000	0.00000 0.00000	0.00000 0.10000	0.00000	0.00000	0.00000	0.00000	0.00000	1.00000	0.00000	0.00000
RECORD #	4	0.00000 0.00000	0.00000 0.00000	1.00000 0.20000	1.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
RECORD #	5	0.00000 0.00000	1.00000 1.00000	1.00000 0.70000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	0.00000
RECORD #	6	0.00000 0.00000	1.00000 0.00000	0.00000 0.20000	0.00000	1.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
RECORD #	7	0.00000 0.00000	0.00000 0.00000	0.00000 0.10000	0.00000	1.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
RECORD #	8	1.00000 1.00000	0.00000 0.00000	1.00000 0.60000	0.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	0.00000
RECORD #	9	0.00000 0.00000	0.00000 0.00000	0.00000 0.10000	0.00000	1.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
RECORD #	10	1.00000 1.00000	0.00000 0.00000	0.00000 0.30000	0.00000	0.00000	0.00000	0.00000	0.00000	1.00000	0.00000	0.00000
RECORD #	21	1.00000 1.00000	1.00000 0.00000	1.00000 0.80000	0.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
RECORD #	22	0.00000 0.00000	1.00000 0.00000	0.00000 0.10000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
RECORD #	23	0.00000 1.00000	0.00000 0.00000	0.00000 0.20000	0.00000	1.00000	1.00000	0.00000	0.00000	0.00000	0.00000	0.00000
RECORD #	24	0.00000 1.00000	0.00000 0.00000	0.00000 0.50000	1.00000	0.00000	0.00000	1.00000	1.00000	1.00000	1.00000	1.00000
RECORD #	25	0.00000 1.00000	1.00000 0.00000	0.00000 0.30000	0.00000	0.00000	0.00000	0.00000	0.00000	1.00000	0.00000	0.00000
RECORD #	26	0.00000 0.00000	0.00000 1.00000	0.00000 0.10000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
RECORD #	27	0.00000 1.00000	0.00000 0.00000	0.00000 0.40000	1.00000	1.00000	1.00000	1.00000	1.00000	0.00000	0.00000	0.00000

INPUT RECORD LISTING WITH RECORD MEANS

RECORD #	28	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.10000					
RECORD #	29	0.00000	0.00000	0.00000	0.00000	0.00000	1.00000	0.00000	0.00000
		1.00000	0.00000	0.30000					
RECORD #	30	0.00000	0.00000	1.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		1.00000	0.00000	0.30000					

CELL MEAN SCORES

*** GRAND MEAN = 0.3033333 ***

MEAN SCORES FOR EFFECT: I

SUBSCRIPT NOTATION: (I)

(1) =	0.266667	(2) =	0.200000	(3) =	0.233333	(4) =	0.366667
(5) =	0.366667	(6) =	0.200000	(7) =	0.500000	(8) =	0.166667
(9) =	0.566667	(10) =	0.166667				

ANOVA TABLE

(** = INFINITE)	P	I							
SAMPLE SIZE	30	10							
UNIVERSE SIZE	***	***							
DEGREES OF FREEDOM			SUMS OF SQUARES FOR MEAN SQUARES	SUMS OF SQUARES FOR SCORE EFFECTS	MEAN SQUARES	STATISTIC F	(QF = QUASI F RATIO)	F-TEST DEGREES OF FREEDOM	NUMERATOR DENOMINATOR
EFFECT									

P	29	37.30000	9.69667	0.33437	1.80796	29	261
I	9	33.03333	5.43000	0.60333	3.26227	9	261
PI	261	91.00000	48.27000	0.18494			
MEAN		27.60333					
TOTAL	299		63.39667				

NOTE: FOR GENERALIZABILITY ANALYSES, F-STATISTICS SHOULD BE IGNORED

GENOVA VERSION 3.1

G STUDY

PAGE

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G STUDY RESULTS

(** = INFINITE) P I
SAMPLE SIZE 30 10
UNIVERSE SIZE ****
QFM = QUADRATIC FORM

EFFECT	DEGREES OF FREEDOM	MODEL	VARIANCE	COMPONENTS	USING EMS EQUATIONS	STANDARD ERROR
P	29	0.0149425	0.0149425	0.0086447		
I	9	0.0139464	0.0139464	0.0085922		
PI	261	0.1849425	0.1849425	0.0161278		

NOTE: THE "ALGORITHM" AND "EMS" ESTIMATED VARIANCE COMPONENTS WILL BE IDENTICAL IF THERE ARE NO NEGATIVE ESTIMATES

GENOVA VERSION 3.1

G STUDY

PAGE

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EXPECTED MEAN SQUARE EQUATIONS

(** = INFINITE) P I
SAMPLE SIZE 30 10
UNIVERSE SIZE ****

EMS(P) = 1.00*VC(PI) + 10.00*VC(P)

EMS(I) = 1.00*VC(PI) + 30.00*VC(I)
EMS(PI) = 1.00*VC(PI)
GENOVA VERSION 3.1
G STUDY

PAGE 9

VARIANCE - COVARIANCE MATRIX FOR ESTIMATED VARIANCE COMPONENTS (V)

	P	I	PI
P	0.0000747		
I	0.0000009	0.0000738	
PI	-0.0000260	-0.0000087	0.0002601

GENOVA VERSION 3.1
G STUDY

PAGE 10

CORRELATION MATRIX FOR ESTIMATED VARIANCE COMPONENTS

	P	I	PI
P	1.0000000		
I	0.0116726	1.0000000	
PI	-0.1865618	-0.0625671	1.0000000

GENOVA VERSION 3.1

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CONTROL CARD INPUT LISTING

COLUMN 111111112222222233333333334444444455555555666666667777777778
1234567890123456789012345678901234567890123456789012345678901234567890
COMMENT WE BEGIN WITH D-STUDY OF PXI DESIGN
DSTUDY
DEFFECT S P
DEFFECT I 30
ENDDSTUDY
GENOVA VERSION 3.1
D STUDY

PAGE 12

D STUDY DESIGN NUMBER 001-001

OBJECT OF MEASUREMENT :	P	I
G STUDY POPULATION SIZE :	INFINITE	G STUDY UNIVERSE SIZES : INFINITE
D STUDY POPULATION SIZE :	INFINITE	D STUDY UNIVERSE SIZES : INFINITE
D STUDY SAMPLE SIZE :	30	D STUDY SAMPLE SIZES : 30

VARIANCE COMPONENTS IN TERMS OF G STUDY UNIVERSE (OF ADMISSIBLE OBSERVATIONS) SIZES				VARIANCE COMPONENTS IN TERMS OF D STUDY UNIVERSE (OF GENERALIZATION) SIZES			
VARIANCE COMPONENTS FOR MEAN SCORES				VARIANCE COMPONENTS FOR MEAN SCORES			
VARIANCE COMPONENTS FOR SINGLE OBSERVATIONS	FINITE UNIVERSE COR-	D STUDY FRE-	STANDARD ERRORS	VARIANCE COMPONENTS FOR SINGLE OBSERVATIONS	FINITE UNIVERSE COR-	D STUDY FRE-	STANDARD ERRORS
EFFECT	RECTIONS	QUENCIES	ESTIMATES	RECTIONS	QUENCIES	ESTIMATES	ERRORS
P	0.01494	1.0000	1	0.01494	1.0000	1	0.01494
I	0.01395	1.0000	30	0.01395	1.0000	30	0.00029
PI	0.18494	1.0000	30	0.18494	1.0000	30	0.00054

QFM = QUADRATIC FORM

STANDARD ERROR OF VARIANCE			
VARIANCE	STANDARD DEVIATION	STANDARD ERROR OF VARIANCE	
UNIVERSE SCORE	0.01494	0.12224	0.00864
EXPECTED OBSERVED SCORE	0.02111	0.14528	0.00856
LOWER CASE DELTA	0.00616	0.07852	0.00054
UPPER CASE DELTA	0.00663	0.08142	0.00059
MEAN	0.00117	0.03418	

GENERALIZABILITY COEFFICIENT = 0.70793 (2.42387)
PHI = 0.69268 (2.25390)

NOTE: SIGNAL/NOISE RATIOS ARE IN PARENTHESES

GENOVA VERSION 3.1

D STUDY

PAGE 13

D STUDY DESIGN NUMBER 001-001

VARIANCE - COVARIANCE MATRIX FOR ESTIMATED VARIANCE COMPONENTS (FOR MEAN SCORES) IN UNIVERSE OF GENERALIZATION (W)

P	I	PI
P	0.0000747	
I	0.0000000	0.0000001
PI	-0.0000009	0.0000000

0.0000003

CONTROL CARD INPUT LISTING

COLUMN 11111111122222222333333334444444455555556666666677777777778
 1234567890123456789012345678901234567890123456789012345678901234567890
 COMMENT WE CAN DESIGN IN D-STUDY BY I:P
 COMMENT WE MUST NOT USE MEASUREMENT OBJECT "P" NESTED WITHIN FACET "I"
 DEFECT S P 30
 *** PREVIOUS CONTROL CARD OUT OF PLACE, ATTEMPT TO CONTINUE ***
 DEFECT I:P 10
 *** PREVIOUS CONTROL CARD OUT OF PLACE, ATTEMPT TO CONTINUE ***
 ENDDSTUDY
 GENOVA VERSION 3.1
 D STUDY

OBJECT OF MEASUREMENT : P FACETS : I
 G STUDY POPULATION SIZE : INFINITE G STUDY UNIVERSE SIZES : INFINITE
 D STUDY POPULATION SIZE : INFINITE D STUDY UNIVERSE SIZES : INFINITE
 D STUDY SAMPLE SIZE : 30 D STUDY SAMPLE SIZES : 30

VARIANCE COMPONENTS IN TERMS OF G STUDY UNIVERSE (OF ADMISSIBLE OBSERVATIONS) SIZES									
VARIANCE COMPONENTS FOR MEAN SCORES					VARIANCE COMPONENTS FOR MEAN SCORES				
VARIANCE COMPONENTS FOR SINGLE OBSERVATIONS	FINITE UNIVERSE COR-	D STUDY SAMPLING FRE-	RECTIONS QUENCIES	ESTIMATES	VARIANCE COMPONENTS FOR SINGLE OBSERVATIONS	FINITE UNIVERSE COR-	D STUDY SAMPLING FRE-	RECTIONS QUENCIES	ESTIMATES
P	0.01494	1.0000	1	0.01494	0.00864	1.0000	1	0.01494	0.00864
I	0.01395	1.0000	30	0.00046	0.00029	1.0000	30	0.00046	0.00029
PI	0.18494	1.0000	30	0.00616	0.00054	1.0000	30	0.00616	0.00054

QFM = QUADRATIC FORM

STANDARD
 ERROR OF
 VARIANCE DEVIATION VARIANCE

แสดงค่าความเชื่อมั่น โดยการใช้ G-Coefficient ของแบบทดสอบวัดความสามารถทางการเรียนวิชาสังคม ศาสนาและวัฒนธรรมเมื่อได้ข้อสอบที่พบว่า
ทำหน้าที่ต่างกัน

GGGGGGGGGG	EEEEEEEEEE	NN	NN	OOOOOOOO	VV	VV	AAAAAAAA
GGGGGGGGGG	EEEEEEEEEE	NNN	NN	OOOOOOOO	VV	VV	AAAAAAAA
GG	EE	NNN	NN	OO	OO	VV	AA
GG	EE	NN	NN	OO	OO	VV	AA
GG	EE	NN	NN	OO	OO	VV	AA
GG	EE	NN	NN	OO	OO	VV	AA
GG	EE	NN	NN	OO	OO	VV	AA
GG	EEEEEE	NN	NN	OO	OO	VV	AA
GG	EEEEEE	NN	NNN	OO	OO	VV	AAAAAAAA
GG	EEEEEE	NN	NNN	OO	OO	VV	AAAAAAAA
GG	EE	NN	NN	OO	OO	VV	AA
GG	EE	NN	NN	OO	OO	VV	AA
GG	EE	NN	NN	OO	OO	VV	AA
GG	EE	NN	NN	OO	OO	V	AA
GG	EE	NN	NN	OO	OO	VVV	AA
GGGGGGGGGG	EEEEEEEEEE	NN	NN	OOOOOOOO	VVV	VVV	AA
GGGGGGGGGG	EEEEEEEEEE	NN	NN	OOOOOOOO	VV	VV	AA

A GENERAL PURPOSE ANALYSIS OF VARIANCE SYSTEM

GENOVA IS A FORTRAN 77 PROGRAM FOR ANALYSIS OF VARIANCE
AND GENERALIZABILITY ANALYSES WITH BALANCED DESIGNS

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RECORD #	3	0.00000 1.00000	0.00000 0.00000	0.00000 0.20000	0.00000	1.00000	0.00000	0.00000	0.00000	0.00000
RECORD #	4	1.00000 1.00000	0.00000 0.00000	0.00000 0.40000	1.00000	0.00000	1.00000	0.00000	0.00000	0.00000
RECORD #	5	1.00000 0.00000	1.00000 0.00000	1.00000 0.50000	1.00000	0.00000	0.00000	0.00000	0.00000	1.00000
RECORD #	6	0.00000 0.00000	0.00000 0.00000	0.00000 0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
RECORD #	7	0.00000 1.00000	0.00000 0.00000	0.00000 0.10000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
RECORD #	8	1.00000 0.00000	1.00000 1.00000	1.00000 0.60000	1.00000	0.00000	1.00000	0.00000	0.00000	0.00000
RECORD #	9	0.00000 1.00000	0.00000 0.00000	0.00000 0.30000	0.00000	1.00000	0.00000	1.00000	0.00000	0.00000
RECORD #	10	1.00000 1.00000	0.00000 0.00000	0.00000 0.20000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
RECORD #	21	1.00000 1.00000	1.00000 0.00000	1.00000 0.50000	1.00000	0.00000	0.00000	0.00000	0.00000	0.00000
RECORD #	22	0.00000 0.00000	0.00000 1.00000	0.00000 0.20000	0.00000	0.00000	0.00000	0.00000	1.00000	0.00000
RECORD #	23	0.00000 0.00000	1.00000 1.00000	0.00000 0.50000	0.00000	1.00000	1.00000	1.00000	0.00000	1.00000
RECORD #	24	0.00000 1.00000	1.00000 0.00000	0.00000 0.70000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
RECORD #	25	1.00000 0.00000	1.00000 0.00000	0.00000 0.20000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
RECORD #	26	0.00000 1.00000	1.00000 0.00000	1.00000 0.40000	0.00000	0.00000	0.00000	0.00000	1.00000	0.00000
RECORD #	27	0.00000 1.00000	0.00000 1.00000	0.00000 0.50000	1.00000	0.00000	1.00000	1.00000	0.00000	1.00000

P	29	55.90000	14.83000	0.51138	2.57316	29	261
I	9	44.30000	3.23000	0.35889	1.80586	9	261
PI	261	111.00000	51.87000	0.19874			
MEAN		41.07000					
TOTAL	299		69.93000				

NOTE: FOR GENERALIZABILITY ANALYSES, F-STATISTICS SHOULD BE IGNORED

GENOVA VERSION 3.1
G STUDY

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G STUDY RESULTS

(** = INFINITE) P I
SAMPLE SIZE 30 10
UNIVERSE SIZE ****

EFFECT	DEGREES OF FREEDOM	MODEL USING ALGORITHM	VARIANCE USING EMS EQUATIONS	COMPONENTS STANDARD ERROR
P	29	0.0312644	0.0312644	0.0131042
I	9	0.0053384	0.0053384	0.0051336
PI	261	0.1987356	0.1987356	0.0173306

QFM = QUADRATIC FORM

NOTE: THE "ALGORITHM" AND "EMS" ESTIMATED VARIANCE COMPONENTS WILL BE IDENTICAL IF THERE ARE NO NEGATIVE ESTIMATES

GENOVA VERSION 3.1
G STUDY

PAGE 8

EXPECTED MEAN SQUARE EQUATIONS

(** = INFINITE) P I
SAMPLE SIZE 30 10
UNIVERSE SIZE ****

EMS (P) = 1.00*VC(PI) + 10.00*VC(P)

VARIANCE COMPONENTS IN TERMS OF G STUDY UNIVERSE (OF ADMISSIBLE OBSERVATIONS) SIZES				VARIANCE COMPONENTS IN TERMS OF D STUDY UNIVERSE (OF GENERALIZATION) SIZES			
VARIANCE COMPONENTS FOR SINGLE OBSERVATIONS		VARIANCE COMPONENTS FOR MEAN SCORES		VARIANCE COMPONENTS FOR SINGLE OBSERVATIONS		VARIANCE COMPONENTS FOR MEAN SCORES	
EFFECT	RECTIONS	FINITE COR-	D STUDY FRE-	ESTIMATES	STANDARD ERRORS	FINITE COR-	D STUDY FRE-
P	0.03126	1.0000	1	0.03126	0.01310	1.0000	1
I	0.00534	1.0000	30	0.00018	0.00017	1.0000	30
PI	0.19874	1.0000	30	0.00662	0.00058	1.0000	30

QFM = QUADRATIC FORM

STANDARD ERROR OF VARIANCE DEVIATION		STANDARD ERROR OF VARIANCE	
UNIVERSE SCORE	0.03126	0.17682	0.01310
EXPECTED OBSERVED SCORE	0.03789	0.19465	0.01304
LOWER CASE DELTA	0.00662	0.08139	0.00058
UPPER CASE DELTA	0.00680	0.08248	0.00058
MEAN	0.00144	0.03796	

GENERALIZABILITY COEFFICIENT = 0.82516 (4.71949)
PHI = 0.82130 (4.59603)

NOTE: SIGNAL/NOISE RATIOS ARE IN PARENTHESES
GENOVA VERSION 3.1
D STUDY

PAGE 13

D STUDY DESIGN NUMBER 001-001

VARIANCE - COVARIANCE MATRIX FOR ESTIMATED VARIANCE COMPONENTS (FOR MEAN SCORES) IN UNIVERSE OF GENERALIZATION (W)

P	I	PI
P	0.0001717	
I	0.0000000	0.0000000
PI	-0.0000010	0.0000003

CONTROL CARD INPUT LISTING

COLUMN 11111111222222223333333344444444555555556666666677777777778
 1234567890123456789012345678901234567890123456789012345678901234567890
 COMMENT WE CAN DESIGN IN D-STUDY BY I:P
 COMMENT WE MUST NOT USE MEASUREMENT OBJECT "P" NESTED WITHIN FACET "I"
 DEFFECT \$ P 30
 *** PREVIOUS CONTROL CARD OUT OF PLACE, ATTEMPT TO CONTINUE ***
 DEFFECT I:P 10
 *** PREVIOUS CONTROL CARD OUT OF PLACE, ATTEMPT TO CONTINUE ***
 ENDDSTUDY
 GENOVA VERSION 3.1
 D STUDY

D STUDY DESIGN NUMBER 001-001

OBJECT OF MEASUREMENT : P FACETS : I
 G STUDY POPULATION SIZE : INFINITE G STUDY UNIVERSE SIZES : INFINITE
 D STUDY POPULATION SIZE : INFINITE D STUDY UNIVERSE SIZES : INFINITE
 D STUDY SAMPLE SIZE : 30 D STUDY SAMPLE SIZES : 30

VARIANCE COMPONENTS IN TERMS OF										
G STUDY UNIVERSE (OF ADMISSIBLE OBSERVATIONS) SIZES					D STUDY UNIVERSE (OF GENERALIZATION) SIZES					
VARIANCE COMPONENTS					VARIANCE COMPONENTS					
FOR MEAN SCORES		FOR MEAN SCORES			FOR MEAN SCORES		FOR MEAN SCORES			
VARIANCE	FINITE	D STUDY	VARIANCE		VARIANCE	FINITE	D STUDY	VARIANCE		
COMPONENTS	UNIVERSE	SAMPLING	COMPONENTS		COMPONENTS	UNIVERSE	SAMPLING	COMPONENTS		
FOR SINGLE	COR-	FRE-	FOR SINGLE		FOR SINGLE	COR-	FRE-	FOR SINGLE		
OBSERVATIONS	RECTIONS	QUENCIES	OBSERVATIONS	RECTIONS	OBSERVATIONS	RECTIONS	QUENCIES	ESTIMATES	STANDARD	
EFFECT	ESTIMATES	ERRORS	ESTIMATES	ERRORS	ESTIMATES	ERRORS	ESTIMATES	ERRORS	ERRORS	
P	0.03126	1.0000	1	0.03126	0.01310	0.03126	1.0000	1	0.03126	0.01310
I	0.00534	1.0000	30	0.00018	0.00017	0.00534	1.0000	30	0.00018	0.00017
PI	0.19874	1.0000	30	0.00662	0.00958	0.19874	1.0000	30	0.00662	0.00058

QFM = QUADRATIC FORM

STANDARD
 STANDARD ERROR OF
 VARIANCE DEVIATION VARIANCE

แสดงค่าความเชื่อมั่น โดยการใช้ $G = \text{Coefficient}$ ของแบบทดสอบวัดความสามารถทางการเรียนวิชาสังคม ศาสนาและวัฒนธรรมเมื่อตัดข้อสอบที่พบว่า
หน้าต่างกัน

```

GGGGGGGGG  EEEEEEEEE  NN  0000000  VV  AAAAAAAAA
GGGGGGGGGG  EEEEEEEEE  NN  000000000  VV  AAAAAAAAAA
G  EE  NN  NN  NN  00  00  VV  AA  AA
GG  EE  NN  NN  NN  00  00  VV  AA  AA
GG  EE  NN  NN  NN  00  00  VV  AA  AA
GG  EE  NN  NN  NN  00  00  VV  AA  AA
GG  EE  NN  NN  NN  00  00  VV  AA  AA
GG  EEEEEEE  NN  NN  NN  00  00  VV  AA  AA
GG  EEEEEEE  NN  NN  NN  00  00  VV  AA  AAAAAA
GG  GGG  EE  NN  NN  NN  00  00  VV  AAAAAA
GG  GGG  EE  NN  NN  NN  00  00  VV  AA  AA
GG  GG  EE  NN  NN  NN  00  00  VV  AA  AA
GG  GG  EE  NN  NN  NN  00  00  V  V  AA  AA
GG  GG  EE  NN  NN  NN  00  00  VVV  AA  AA
GGGGGGGGGG  EEEEEEEEE  NN  000000000  VVV  AA  AA
GGGGGGGGGG  EEEEEEEEE  NN  0000000  VV  AA  AA

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GENOVA IS A FORTRAN 77 PROGRAM FOR ANALYSIS OF VARIANCE
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University of Iowa
Iowa City, Iowa 52242

VERSION 3.1

RECORD #	3	0.00000 0.00000	0.00000 0.22222	0.00000	1.00000	0.00000	0.00000	0.00000	1.00000
RECORD #	4	1.00000 0.00000	0.00000 0.44444	1.00000	0.00000	1.00000	0.00000	0.00000	1.00000
RECORD #	5	1.00000 0.00000	1.00000 0.44444	1.00000	0.00000	0.00000	0.00000	1.00000	0.00000
RECORD #	6	0.00000 0.00000	0.00000 0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
RECORD #	7	0.00000 0.00000	0.00000 0.11111	0.00000	0.00000	0.00000	0.00000	0.00000	1.00000
RECORD #	8	1.00000 1.00000	1.00000 0.55556	1.00000	0.00000	1.00000	0.00000	0.00000	0.00000
RECORD #	9	0.00000 0.00000	0.00000 0.33333	0.00000	1.00000	0.00000	1.00000	0.00000	1.00000
RECORD #	10	1.00000 0.00000	0.00000 0.22222	0.00000	0.00000	0.00000	0.00000	0.00000	1.00000
RECORD #	21	1.00000 0.00000	1.00000 0.44444	1.00000	0.00000	0.00000	0.00000	0.00000	1.00000
RECORD #	22	0.00000 1.00000	0.00000 0.22222	0.00000	0.00000	0.00000	1.00000	0.00000	0.00000
RECORD #	23	0.00000 1.00000	1.00000 0.55556	0.00000	1.00000	1.00000	0.00000	1.00000	0.00000
RECORD #	24	0.00000 0.00000	1.00000 0.77778	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
RECORD #	25	1.00000 0.00000	1.00000 0.22222	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
RECORD #	26	0.00000 0.00000	1.00000 0.33333	0.00000	0.00000	0.00000	1.00000	0.00000	1.00000
RECORD #	27	0.00000 1.00000	0.00000 0.55556	1.00000	0.00000	1.00000	0.00000	1.00000	1.00000

INPUT RECORD LISTING WITH RECORD MEANS

RECORD #	28	0.00000 0.00000	0.00000 0.17111	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
RECORD #	29	0.00000 0.00000	0.00000 0.22222	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
RECORD #	30	0.00000 1.00000	1.00000 0.66667	0.00000	0.00000	1.00000	1.00000	0.00000	1.00000	0.00000

CELL MEAN SCORES

*** GRAND MEAN = 0.3814815 ***

MEAN SCORES FOR EFFECT: I

SUBSCRIPT NOTATION: (I)

(1) =	0.400000	(2) =	0.533333	(3) =	0.400000	(4) =	0.200000
(5) =	0.400000	(6) =	0.366667	(7) =	0.333333	(8) =	0.533333

ANOVA TABLE

EFFECT	DEGREES OF FREEDOM	SUMS OF SQUARES MEAN SQUARES	SUMS OF SQUARES FOR SCORE EFFECTS	MEAN SQUARES	F STATISTIC	(QF = QUASI F RATIO) F-TEST DEGREES OF FREEDOM NUMERATOR	DEGREES OF FREEDOM DENOMINATOR
(** = INFINITE)	P	I					
SAMPLE SIZE	30	9					
UNIVERSE SIZE	***	***					

P	29	55.22222	15.92963	0.54930	2.83801	29	232
I	8	42.16667	2.87407	0.35926	1.85615	8	232
PI	232	103.00000	44.90370	0.19355			
MEAN		39.29259					
TOTAL	269		63.70741				

NOTE: FOR GENERALIZABILITY ANALYSES, F-STATISTICS SHOULD BE IGNORED

GENOVA VERSION 3.1
G STUDY

PAGE 7

G STUDY RESULTS

(** = INFINITE) P I QFM = QUADRATIC FORM
SAMPLE SIZE 30 9
UNIVERSE SIZE ****

EFFECT	DEGREES OF FREEDOM	MODEL VARIANCE COMPONENTS	USING EQUATIONS	STANDARD ERROR
P	29	0.0395275	0.0395275	0.0156294
I	8	0.0055236	0.0055236	0.0053886
PI	232	0.1935504	0.1935504	0.0178937

NOTE: THE "ALGORITHM" AND "EMS" ESTIMATED VARIANCE COMPONENTS WILL BE IDENTICAL IF THERE ARE NO NEGATIVE ESTIMATES

GENOVA VERSION 3.1
G STUDY

PAGE 8

EXPECTED MEAN SQUARE EQUATIONS

(** = INFINITE) P I
SAMPLE SIZE 30 9
UNIVERSE SIZE ****

EMS (P) = 1.00*VC(PI) + 9.00*VC(P)

VARIANCE COMPONENTS IN TERMS OF G STUDY UNIVERSE (OF ADMISSIBLE OBSERVATIONS) SIZES				VARIANCE COMPONENTS IN TERMS OF D STUDY UNIVERSE (OF GENERALIZATION) SIZES			
VARIANCE COMPONENTS				VARIANCE COMPONENTS			
VARIANCE COMPONENTS FOR SINGLE OBSERVATIONS	FINITE UNIVERSE COR-	D STUDY FRE-	STANDARD ERRORS	VARIANCE COMPONENTS FOR SINGLE OBSERVATIONS	FINITE UNIVERSE COR-	D STUDY FRE-	STANDARD ERRORS
P	0.03953	1.0000	1	0.03953	1.0000	1	0.03953
I	0.00552	1.0000	30	0.00018	1.0000	30	0.00018
PI	0.19355	1.0000	30	0.00645	1.0000	30	0.00645

QFM = QUADRATIC FORM

STANDARD ERROR OF		STANDARD ERROR OF	
VARIANCE	DEVIATION	VARIANCE	DEVIATION
UNIVERSE SCORE	0.03953	0.19882	0.01563
EXPECTED OBSERVED SCORE	0.04598	0.21443	0.01556
LOWER CASE DELTA	0.00645	0.08032	0.00060
UPPER CASE DELTA	0.00664	0.08146	0.00060
MEAN	0.00172	0.04143	

GENERALIZABILITY COEFFICIENT = 0.85968 (6.12669)
PHI = 0.85625 (5.95670)

NOTE: SIGNAL/NOISE RATIOS ARE IN PARENTHESES
GENOVA VERSION 3.1
D STUDY

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D STUDY DESIGN NUMBER 001-001

VARIANCE - COVARIANCE MATRIX FOR ESTIMATED VARIANCE COMPONENTS (FOR MEAN SCORES) IN UNIVERSE OF GENERALIZATION (W)

P	I	PI
P	0.0002443	
I	0.0000000	0.0000000
PI	-0.0000012	0.0000000

แสดงค่าความเชื่อมั่น โดยการใช้ G - Coefficient ของแบบทดสอบวัดความสามารถทางการเรียนรู้วิชาภาษาอังกฤษยังไม่ดีข้อสอบที่พบว่าทำ
 หน้าต่างกันออก

```

GGGGGGGGGG  EEEEEEEEEEE  NN  00000000  VV  VV  AAAAAAAAAA
GGGGGGGGGGGG  EEEEEEEEEEEEE  NNN  0000000000  VV  VV  AAAAAAAAAAAA
GG  EE  NN  NN  NN  NN  NN  NN  NN  NN  NN  NN  VV  AA  AA
GG  EE  NN  NN  NN  NN  NN  NN  NN  NN  NN  NN  VV  AA  AA
GG  EE  NN  NN  NN  NN  NN  NN  NN  NN  NN  NN  VV  AA  AA
GG  EE  NN  NN  NN  NN  NN  NN  NN  NN  NN  NN  VV  AA  AA
GG  EE  NN  NN  NN  NN  NN  NN  NN  NN  NN  NN  VV  AA  AA
GG  EEEEEEE  NN  NN  NN  NN  NN  NN  NN  NN  NN  NN  NN  VV  AA  AA
GG  EEEEEEE  NN  NN  NN  NN  NN  NN  NN  NN  NN  NN  NN  VV  AAAAAAAAAA
GG  GGGG  EE  NN  NN  NN  NN  NN  NN  NN  NN  NN  NN  VV  AAAAAAAAAA
GG  GGGG  EE  NN  NN  NN  NN  NN  NN  NN  NN  NN  NN  VV  AA  AA
GG  GG  EE  NN  NN  NN  NN  NN  NN  NN  NN  NN  NN  VV  AA  AA
GG  GG  EE  NN  NN  NN  NN  NN  NN  NN  NN  NN  NN  V  V  AA  AA
GG  GG  EE  NN  NN  NN  NN  NN  NN  NN  NN  NN  NN  VVV  AA  AA
GGGGGGGGGGGG  EEEEEEEEEEE  NN  NN  0000000000  VVVV  AA  AA
GGGGGGGGGGGG  EEEEEEEEEEE  NN  NN  00000000  VV  AA  AA
    
```

A GENERAL PURPOSE ANALYSIS OF VARIANCE SYSTEM

GENOVA IS A FORTRAN 77 PROGRAM FOR ANALYSIS OF VARIANCE
 AND GENERALIZABILITY ANALYSES WITH BALANCED DESIGNS

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VERSION 3.1
 January, 2001

GENOVA VERSION 3.1
G STUDY

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INPUT RECORD LISTING WITH RECORD MEANS

RECORD #	28	1.00000	1.00000	0.00000	0.00000	0.00000	0.00000	0.00000	1.00000
		1.00000	0.00000	0.40000					
RECORD #	29	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	1.00000	0.00000
		0.00000	0.00000	0.10000					
RECORD #	30	0.00000	1.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
		0.00000	0.00000	0.10000					

GENOVA VERSION 3.1
G STUDY

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CELL MEAN SCORES

*** GRAND MEAN = 0.1966667 ***

MEAN SCORES FOR EFFECT: I SUBSCRIPT NOTATION: (I)

(1) =	0.166667	(2) =	0.266667	(3) =	0.133333	(4) =	0.100000
(5) =	0.066667	(6) =	0.333333	(7) =	0.200000	(8) =	0.266667
(9) =	0.200000	(10) =	0.233333				

GENOVA VERSION 3.1
G STUDY

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ANOVA TABLE

(** = INFINITE)	P	I	
SAMPLE SIZE	30	10	
UNIVERSE SIZE	***	***	
DEGREES OF FREEDOM	SUMS OF SQUARES FOR MEAN SCORES	SUMS OF SQUARES FOR SCORE EFFECTS	MEAN SQUARES
EFFECT	OF FREEDOM	STATISTIC	F
		(OF = QUASI F RATIO)	F-TEST DEGREES OF FREEDOM
		NUMERATOR	DENOMINATOR

P	29	17.10000	5.49667	0.18954	1.23459	29	261
I	9	13.43333	1.83000	0.20333	1.32443	9	261
PI	261	59.00000	40.07000	0.15352			
MEAN		11.60333					
TOTAL	299		47.39667				

NOTE: FOR GENERALIZABILITY ANALYSES, F-STATISTICS SHOULD BE IGNORED

GENOVA VERSION 3.1
G STUDY

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G STUDY RESULTS

(** = INFINITE) P I
SAMPLE SIZE 30 10
UNIVERSE SIZE *** **** QFM = QUADRATIC FORM

EFFECT	DEGREES OF FREEDOM	MODEL USING ALGORITHM	VARIANCE USING EMS EQUATIONS	COMPONENTS STANDARD ERROR
P	29	0.0036015	0.0036015	0.0049970
I	9	0.0016603	0.0016603	0.0029243
PI	261	0.1535249	0.1535249	0.0133880

NOTE: THE "ALGORITHM" AND "EMS" ESTIMATED VARIANCE COMPONENTS WILL BE IDENTICAL IF THERE ARE NO NEGATIVE ESTIMATES

GENOVA VERSION 3.1
G STUDY

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EXPECTED MEAN SQUARE EQUATIONS

(** = INFINITE) P I
SAMPLE SIZE 30 10
UNIVERSE SIZE *** ****

EMS(P) = 1.00*VC(PI) + 10.00*VC(P)

EMS(I) = 1.00*VC(PI) + 30.00*VC(I)
EMS(PI) = 1.00*VC(PI)
GENOVA VERSION 3.1
G STUDY

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VARIANCE - COVARIANCE MATRIX FOR ESTIMATED VARIANCE COMPONENTS (V)

	P	I	PI
P	0.0000250		
I	0.0000006	0.0000086	
PI	-0.0000179	-0.0000060	0.0001792
GENOVA VERSION 3.1			
G STUDY			

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CORRELATION MATRIX FOR ESTIMATED VARIANCE COMPONENTS

	P	I	PI
P	1.0000000		
I	0.0408863	1.0000000	
PI	-0.2679203	-0.1526061	1.0000000
GENOVA VERSION 3.1			

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CONTROL CARD INPUT LISTING

COLUMN 1111111122222222333333334444444455555555666666667777777778
1234567890123456789012345678901234567890123456789012345678901234567890
COMMENT WE BEGIN WITH D-STUDY OF PXI DESIGN
DSTUDY
DEFFECT \$ P
DEFFECT I 30
ENDDSTUDY
GENOVA VERSION 3.1
D STUDY

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D STUDY DESIGN NUMBER 001-001

OBJECT OF MEASUREMENT : P
G STUDY POPULATION SIZE : INFINITE
D STUDY POPULATION SIZE : INFINITE
D STUDY SAMPLE SIZE : 30
FACETS : I
G STUDY UNIVERSE SIZES : INFINITE
D STUDY UNIVERSE SIZES : INFINITE
D STUDY SAMPLE SIZES : 30

VARIANCE COMPONENTS IN TERMS OF G STUDY UNIVERSE (OF ADMISSIBLE OBSERVATIONS) SIZES				VARIANCE COMPONENTS IN TERMS OF D STUDY UNIVERSE (OF GENERALIZATION) SIZES			
VARIANCE COMPONENTS FOR SINGLE OBSERVATIONS		VARIANCE COMPONENTS FOR MEAN SCORES		VARIANCE COMPONENTS FOR SINGLE OBSERVATIONS		VARIANCE COMPONENTS FOR MEAN SCORES	
VARIANCE COMPONENTS FOR SINGLE OBSERVATIONS	FINITE UNIVERSE COR- RECTIONS	D STUDY FRE- QUENCIES	STANDARD ERRORS	VARIANCE COMPONENTS FOR SINGLE OBSERVATIONS	FINITE UNIVERSE COR- RECTIONS	D STUDY FRE- QUENCIES	STANDARD ERRORS
P	0.00360	1.0000	1	0.00360	1.0000	1	0.00360
I	0.00166	1.0000	30	0.00006	1.0000	30	0.00006
PI	0.15352	1.0000	30	0.00512	1.0000	30	0.00512

QFM = QUADRATIC FORM

VARIANCE COMPONENTS IN TERMS OF G STUDY UNIVERSE (OF ADMISSIBLE OBSERVATIONS) SIZES		VARIANCE COMPONENTS IN TERMS OF D STUDY UNIVERSE (OF GENERALIZATION) SIZES	
VARIANCE COMPONENTS FOR SINGLE OBSERVATIONS		VARIANCE COMPONENTS FOR SINGLE OBSERVATIONS	
VARIANCE COMPONENTS FOR SINGLE OBSERVATIONS	FINITE UNIVERSE COR- RECTIONS	D STUDY FRE- QUENCIES	STANDARD ERRORS
P	0.00360	1.0000	1
I	0.00166	1.0000	30
PI	0.15352	1.0000	30

NOTE: SIGNAL/NOISE RATIOS ARE IN PARENTHESES

GENOVA VERSION 3.1

D STUDY

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D STUDY DESIGN NUMBER 001-001

VARIANCE - COVARIANCE MATRIX FOR ESTIMATED VARIANCE COMPONENTS (FOR MEAN SCORES) IN UNIVERSE OF GENERALIZATION (W)

P	I	PI
0.0000250		
0.0000000	0.0000000	
-0.0000006	0.0000000	0.0000002

CONTROL CARD INPUT LISTING

COLUMN 1111111112222222333333333444444455555556666667777777778
 123456789012345678901234567890123456789012345678901234567890
 COMMENT WE CAN DESIGN IN D-STUDY BY I:P
 DEFFECT \$ P 30
 *** PREVIOUS CONTROL CARD OUT OF PLACE, ATTEMPT TO CONTINUE ***
 DEFFECT I:P 10
 *** PREVIOUS CONTROL CARD OUT OF PLACE, ATTEMPT TO CONTINUE ***
 ENDDSTUDY
 GENOVA VERSION 3.1
 D STUDY

D STUDY DESIGN NUMBER 001-001

OBJECT OF MEASUREMENT : P FACETS : I
 G STUDY POPULATION SIZE : INFINITE G STUDY UNIVERSE SIZES : INFINITE
 D STUDY POPULATION SIZE : INFINITE D STUDY UNIVERSE SIZES : INFINITE
 D STUDY SAMPLE SIZE : 30 D STUDY SAMPLE SIZES : 30

VARIANCE COMPONENTS IN TERMS OF									
G STUDY UNIVERSE (OF ADMISSIBLE OBSERVATIONS) SIZES					D STUDY UNIVERSE (OF GENERALIZATION) SIZES				
VARIANCE COMPONENTS FOR MEAN SCORES					VARIANCE COMPONENTS FOR MEAN SCORES				
VARIANCE COMPONENTS FOR SINGLE OBSERVATIONS	FINITE COR-	D STUDY FRE-	RECTIONS QUENCIES	ESTIMATES	VARIANCE COMPONENTS FOR SINGLE OBSERVATIONS	FINITE COR-	D STUDY FRE-	RECTIONS QUENCIES	ESTIMATES
P	0.00360	1.0000	1	0.00360	0.00500	0.00360	1.0000	1	0.00360
I	0.00166	1.0000	30	0.00006	0.00010	0.00166	1.0000	30	0.00006
PI	0.15352	1.0000	30	0.00512	0.00045	0.15352	1.0000	30	0.00512
QFM = QUADRATIC FORM									
STANDARD ERROR OF VARIANCE DEVIATION					STANDARD ERROR OF VARIANCE DEVIATION				

แสดงค่าความเชื่อมั่น โดยการใช้ G-Coefficient ของแบบทดสอบวัดความสามารถการเรียนรู้ภาษาอังกฤษเมื่อตัดข้อสอบที่พบว่าทำหน้า
ต่างกัน

GGGGGGGGGG	EEEEEEEEEE	NN	NN	OOOOOOOO	VV	VV	AAAAAAAAAA
GGGGGGGGGG	EEEEEEEEEE	NNN	NN	OOOOOOOOOO	VV	VV	AAAAAAAAAAAA
GG	EE	NNN	NN	OO	VV	VV	AA
GG	EE	NN	NN	OO	VV	VV	AA
GG	EE	NN	NN	OO	VV	VV	AA
GG	EE	NN	NN	OO	VV	VV	AA
GG	EE	NN	NN	OO	VV	VV	AA
GG	EEEEEE	NN	NN	OO	VV	VV	AA
GG	EEEEEEEE	NN	NN	OO	VV	VV	AA
GG	EEEEEEEE	NN	NNN	OO	VV	VV	AAAAAAAAAAAA
GG	EE	NN	NN	OO	VV	VV	AAAAAAAAAAAA
GG	EE	NN	NN	OO	VV	VV	AA
GG	EE	NN	NN	OO	VV	VV	AA
GG	EE	NN	NN	OO	VV	VV	AA
GG	EE	NN	NN	OO	V	V	AA
GG	EE	NN	NN	OO	VVV	VVV	AA
GGGGGGGGGG	EEEEEEEEEE	NN	NN	OOOOOOOOOO	VVVV	VVVV	AA
GGGGGGGGGG	EEEEEEEEEE	NN	NN	OOOOOOOO	VV	VV	AA

A GENERAL PURPOSE ANALYSIS OF VARIANCE SYSTEM

GENOVA IS A FORTRAN 77 PROGRAM FOR ANALYSIS OF VARIANCE
AND GENERALIZABILITY ANALYSES WITH BALANCED DESIGNS

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VERSION 3.1
January, 2001

INPUT RECORD LISTING WITH RECORD MEANS

RECORD #	28	1.00000 0.50000	1.00000	0.00000	0.00000	0.00000	0.00000	1.00000	1.00000
RECORD #	29	0.00000 0.12500	0.00000	0.00000	0.00000	0.00000	1.00000	0.00000	0.00000
RECORD #	30	0.00000 0.12500	1.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

CELL MEAN SCORES

*** GRAND MEAN = 0.200000 ***

MEAN SCORES FOR EFFECT: I SUBSCRIPT NOTATION: (I)

(1) =	0.166667	(2) =	0.266667	(3) =	0.100000	(4) =	0.066667
(5) =	0.333333	(6) =	0.200000	(7) =	0.266667	(8) =	0.200000

GENOVA VERSION 3.1
G STUDY

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ANOVA TABLE

(** = INFINITE)		P	I		
SAMPLE SIZE	30		8		
UNIVERSE SIZE	***		***		
DEGREES OF FREEDOM		SUMS OF SQUARES	SUMS OF SQUARES	(QF = QUASI F RATIO)	
EFFECT		MEAN SCORES	SCORE EFFECTS	MEAN SQUARES	F-TEST DEGREES OF FREEDOM
				STATISTIC	NUMERATOR DENOMINATOR

P	29	15.75000	6.15000	0.21207	1.40763	29	203
I	7	11.26667	1.66667	0.23810	1.58038	7	203
PI	203	48.00000	30.58333	0.15066			
MEAN		9.60000					
TOTAL	239		38.40000				

NOTE: FOR GENERALIZABILITY ANALYSES, F-STATISTICS SHOULD BE IGNORED
GENOVA VERSION 3.1
G STUDY
PAGE 7

(** = INFINITE) P I
SAMPLE SIZE 30 8
UNIVERSE SIZE ***
QFM = QUADRATIC FORM

MODEL VARIANCE COMPONENTS			
EFFECT	DEGREES OF FREEDOM	USING EMS ALGORITHM	STANDARD ERROR
P	29	0.0076765	0.0069854
I	7	0.0029146	0.0037740
PI	203	0.1506568	0.0148808

NOTE: THE "ALGORITHM" AND "EMS" ESTIMATED VARIANCE COMPONENTS WILL BE IDENTICAL IF THERE ARE NO NEGATIVE ESTIMATES
GENOVA VERSION 3.1
G STUDY
PAGE 8

EXPECTED MEAN SQUARE EQUATIONS

(** = INFINITE) P I
SAMPLE SIZE 30 8
UNIVERSE SIZE ***

EMS(P) = 1.00*VC(PI) + 8.00*VC(P)
EMS(I) = 1.00*VC(PI) + 30.00*VC(I)

VARIANCE COMPONENTS IN TERMS OF G STUDY UNIVERSE (OF ADMISSIBLE OBSERVATIONS) SIZES				VARIANCE COMPONENTS IN TERMS OF D STUDY UNIVERSE (OF GENERALIZATION) SIZES					
VARIANCE COMPONENTS FOR SINGLE OBSERVATIONS		VARIANCE COMPONENTS FOR MEAN SCORES		VARIANCE COMPONENTS FOR SINGLE OBSERVATIONS		VARIANCE COMPONENTS FOR MEAN SCORES			
EFFECT	FINITE UNIVERSE COR- RECTIONS	D STUDY UNIVERSE PRE- FRE- QUENCIES	ESTIMATES	STANDARD ERRORS	FINITE UNIVERSE COR- RECTIONS	D STUDY UNIVERSE PRE- FRE- QUENCIES	ESTIMATES	STANDARD ERRORS	
P	0.00768	1.0000	1	0.00768	0.00699	1.0000	1	0.00768	0.00699
I	0.00291	1.0000	30	0.00010	0.00013	1.0000	30	0.00010	0.00013
PI	0.15066	1.0000	30	0.00502	0.00050	1.0000	30	0.00502	0.00050

QFM = QUADRATIC FORM

STANDARD
ERROR OF
VARIANCE
DEVIATION

UNIVERSE SCORE	0.00768	0.08762	0.00699
EXPECTED OBSERVED SCORE	0.01270	0.11269	0.00687
LOWER CASE DELTA	0.00502	0.07087	0.00050
UPPER CASE DELTA	0.00512	0.07155	0.00050
MEAN	0.00052	0.02281	

GENERALIZABILITY COEFFICIENT = 0.60453 (1.52861)
PHI = 0.59994 (1.49960)

NOTE: SIGNAL/NOISE RATIOS ARE IN PARENTHESES
GENOVA VERSION 3.1
D STUDY

PAGE 13

D STUDY DESIGN NUMBER 001-001

VARIANCE - COVARIANCE MATRIX FOR ESTIMATED VARIANCE COMPONENTS (FOR MEAN SCORES) IN UNIVERSE OF GENERALIZATION (W)

P	I	PI
P	0.0000488	
I	0.0000000	0.0000000
PI	-0.0000009	0.0000000

GENOVA VERSION 3.1

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CONTROL CARD INPUT LISTING

COLUMN 11111111112222223333334444445555556666667777778
 123456789012345678901234567890123456789012345678901234567890
 COMMENT WE CAN DESIGN IN D-STUDY BY I:P
 COMMENT WE MUST NOT USE MEASUREMENT OBJECT "P" NESTED WITHIN FACET "I"
 DEFFECT \$ P 30
 *** PREVIOUS CONTROL CARD OUT OF PLACE, ATTEMPT TO CONTINUE ***
 DEFFECT I:P 8
 *** PREVIOUS CONTROL CARD OUT OF PLACE, ATTEMPT TO CONTINUE ***
 ENDDSTUDY
 GENOVA VERSION 3.1
 D STUDY

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D STUDY DESIGN NUMBER 001-001

OBJECT OF MEASUREMENT : P FACETS : I
 G STUDY POPULATION SIZE : INFINITE G STUDY UNIVERSE SIZES : INFINITE
 D STUDY POPULATION SIZE : INFINITE D STUDY UNIVERSE SIZES : INFINITE
 D STUDY SAMPLE SIZE : 30 D STUDY SAMPLE SIZES : 30

VARIANCE COMPONENTS IN TERMS OF									
G STUDY UNIVERSE (OF ADMISSIBLE OBSERVATIONS) SIZES					D STUDY UNIVERSE (OF GENERALIZATION) SIZES				
VARIANCE COMPONENTS					VARIANCE COMPONENTS				
FOR MEAN SCORES		FOR MEAN SCORES		STANDARD ERRORS	FOR MEAN SCORES		FOR MEAN SCORES		STANDARD ERRORS
VARIANCE COMPONENTS FOR SINGLE OBSERVATIONS	FINITE UNIVERSE COR- RECTIONS	D STUDY FRE- QUENCIES	D STUDY SAMPLING		VARIANCE COMPONENTS FOR SINGLE OBSERVATIONS	FINITE UNIVERSE COR- RECTIONS	D STUDY FRE- QUENCIES	D STUDY SAMPLING	
EFFECT	OBSERVATIONS	RECTIONS	QUENCIES	ESTIMATES	OBSERVATIONS	RECTIONS	QUENCIES	ESTIMATES	ERRORS
P	0.00768	1.0000	1	0.00768	0.00768	1.0000	1	0.00768	0.00699
I	0.00291	1.0000	30	0.00010	0.00291	1.0000	30	0.00010	0.00013
PI	0.15066	1.0000	30	0.00502	0.15066	1.0000	30	0.00502	0.00050

QFM = QUADRATIC FORM

STANDARD
 ERROR OF
 VARIANCE DEVIATION VARIANCE

UNIVERSE SCORE	0.00768	0.08762	0.00699	
EXPECTED OBSERVED SCORE	0.01270	0.11269	0.00687	
LOWER CASE DELTA	0.00502	0.07087	0.00050	GENERALIZABILITY COEFFICIENT = 0.60453 (1.52861)
UPPER CASE DELTA	0.00512	0.07155	0.00050	PHI = 0.59994 (1.49960)
MEAN	0.00052	0.02281		

NOTE: SIGNAL/NOISE RATIOS ARE IN PARENTHESES
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 D STUDY

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VARIANCE - COVARIANCE MATRIX FOR ESTIMATED VARIANCE COMPONENTS (FOR MEAN SCORES) IN UNIVERSE OF GENERALIZATION (W)

P	I	PI
0.0000488=		
0.0000000	0.0000000	
-0.0000009	0.0000000	0.0000002

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CONTROL CARD INPUT LISTING

COLUMN 1111111122222233333333334444444444555555555566666666677777777778
 1234567890123456789012345678901234567890123456789012345678901234567890
 FINISH