

### ภาคผนวก จ

ผลการวิเคราะห์สัมประสิทธิ์การสรุปอ้างอิง (G-Coefficient) มาตรฐานคณะครูปฐมวัย  
ศูนย์พัฒนาเด็กเล็ก

ผลการวิเคราะห์สัมประสิทธิ์การสุรूपอ้างอิง (G-Coefficient)มาตรฐานวัดสมรรถนะครูปฐมวัย  
ศูนย์พัฒนาเด็กเล็กในภาพรวมทั้งฉบับ (เฉพาะในส่วนที่สำคัญ)

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

GENOVA has been checked for accuracy of output, however the authors  
can make no assurances that the program is totally without error.

GENOVA was developed in part under contract No. N00123-78-C-1206 with the Navy  
Personnel Research and

Development Center (NPRDC); Robert L. Brennan Principal Investigator. GENOVA does  
not necessarily

reflect NPRDC positions or policy, and no official endorsement should be inferred

GENOVA VERSION 3.

CONTROL CARD INPUT LISTING

COLUMN

11111111112222222222333333333344444444445555555555666666666677777777778

1234567890123456789012345678901234567890123456789012345678901234567890

STUDY Design in this study is i:p

COMMENT

COMMENT # RECORDS = 107

COMMENT # VALUES PER RECORD = 54

COMMENT

COMMENT # ITEM = 54

OPTIONS RECORDS ALL CORRELATION

EFFECT \* P 107 0

EFFECT + I 54 0

FORMAT (54F1.0)

PROCESS

STUDY Design in this study is i:p

EXPANDED MAIN AND INTERACTION EFFECT TABLE

(** = INFINITE)	P	I	TOTAL DEGREES
SAMPLE SIZE	107	54	PRIMARY NUMBER OF
UNIVERSE SIZE	****	****	INDICES INDICES FREEDOM

\*\*\*\*\*

*	*	*	*
* P	* 1	* 0	* 1 1 106
* I	* 0	* 1	* 1 1 53
*	*	*	*

\*\*\*\*\*

*	*	*	*
* PI	* 1	* 1	* 2 2 5618
*	*	*	*

\*\*\*\*\*

STUDY Design in this study is i:p

G STUDY Design in this study is i:p

CELL MEAN SCORES

\*\*\*\*\*

\*\*\* GRAND MEAN = 2.1599169 \*\*\*

\*\*\*\*\*

MEAN SCORES FOR EFFECT: I		SUBSCRIPT NOTATION: (I)	
(1) =	0.000000E+00	(2) =	4.401869
(3) =	0.000000E+00	(4) =	4.457944
(5) =	0.000000E+00	(6) =	4.411215
(7) =	0.000000E+00	(8) =	4.448598
(9) =	0.000000E+00	(10) =	4.373832
(11) =	0.000000E+00	(12) =	4.383178
(13) =	0.000000E+00	(14) =	4.373832
(15) =	0.000000E+00	(16) =	4.355140
(17) =	0.000000E+00	(18) =	4.392523
(19) =	0.000000E+00	(20) =	4.373832
(21) =	0.000000E+00	(22) =	4.252336
(23) =	0.000000E+00	(24) =	4.355140
(25) =	0.000000E+00	(26) =	4.308411
(27) =	0.000000E+00	(28) =	4.168224
(29) =	0.000000E+00	(30) =	4.345794
(31) =	0.000000E+00	(32) =	4.233645
(33) =	0.000000E+00	(34) =	4.271028
(35) =	0.000000E+00	(36) =	4.308411
(37) =	0.000000E+00	(38) =	4.252336
(39) =	0.000000E+00	(40) =	4.345794
(41) =	0.000000E+00	(42) =	4.317757
(43) =	0.000000E+00	(44) =	4.308411
(45) =	0.000000E+00	(46) =	4.327103
(47) =	0.000000E+00	(48) =	4.289720
(49) =	0.000000E+00	(50) =	4.242991
(51) =	0.000000E+00	(52) =	4.205607
(53) =	0.000000E+00	(54) =	4.130841

GENOVA VERSION 3.1

G STUDY

Design in this study is i:p

ANOVA TABLE

(\*\* = INFINITE) P I

SAMPLE SIZE 107 54  
 UNIVERSE SIZE \*\*\*\* \*\*

---

	DEGREES	SUMS OF	SUMS OF	MEAN	F	F-	
RATIO)	OF	SQUARES FOR	SQUARES FOR	SCORES	SQUARES	F-	
TEST DEGREES OF FREEDOM	EFFECT	FREEDOM	SCORES	EFFECTS			
STATISTIC	NUMERATOR	DENOMINATOR					
P	106	27233.03704	277.27380	2.61579	16.02650	106	5618
I	53	53929.77570	26974.01246	508.94363	3118.21120	53	5618
PI	5618	55124.00000	916.95050	0.16322			
MEAN		26955.76324					
TOTAL	5777		28168.23676				

---

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

G STUDY Design in this study is i:p

G STUDY RESULTS

(\*\* = INFINITE) P I  
 SAMPLE SIZE 107 54  
 UNIVERSE SIZE \*\*\*\* \*\* QFM = QUADRATIC

FORM

---

MODEL VARIANCE COMPONENTS				
EFFECT	DEGREES	USING	USING EMS	STANDARD
	OF	ALGORITHM	EQUATIONS	ERROR
	FREEDOM			
P	106	0.0454180	0.0454180	0.0065922
I	53	4.7549571	4.7549571	0.9070256

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PI	5618	0.1632165	0.1632165	0.0030790
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NOTE: THE "ALGORITHM" AND "EMS" ESTIMATED VARIANCE COMPONENTS WILL BE IDENTICAL IF THERE ARE NO NEGATIVE ESTIMATES

GENOVA VERSION 3.1

G STUDY Design in this study is i:p

EXPECTED MEAN SQUARE EQUATIONS

(\*\* = INFINITE) P I  
 SAMPLE SIZE 107 54  
 UNIVERSE SIZE \*\*\*\* \*\*\*\*

EMS(P) = 1.00\*VC(PI) + 54.00\*VC(P)  
 EMS(I) = 1.00\*VC(PI) + 107.00\*VC(I)  
 EMS(PI) = 1.00\*VC(PI)

GENOVA VERSION 3.1

G STUDY Design in this study is i:p

VARIANCE - COVARIANCE MATRIX FOR ESTIMATED VARIANCE

COMPONENTS (V)

	P	I	PI
P	0.0000435		
I	0.0000000	0.8226955	
PI	-0.0000002	-0.0000001	0.0000095

GENOVA VERSION 3.1

G STUDY Design in this study is i:p

CORRELATION MATRIX FOR ESTIMATED VARIANCE

COMPONENTS

	P	I	PI
P	1.0000000		
I	0.0000003	1.0000000	
PI	-0.0086495	-0.0000317	1.0000000

GENOVA VERSION 3.1

CONTROL CARD INPUT LISTING

COLUMN

1111111111222222222233333333333344444444445555555555666666666677777777778

123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890

COMMENT

COMMENT CUMPUTE G-CO

comment analysis of D STUDY

INVALID KEYWORD FOUND ON CONTROL CARD: CARD IMAGE =

comment analysis of D STUDY

DSTUDY D-study for IXP

DEFFECT \$ P

DEFFECT I 54

ENDDSTUDY

GENOVA VERSION 3.1

D STUDY

D-study for IXP

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 : 107 D STUDY SAMPLE SIZES : 54

-----  
 VARIANCE COMPONENTS IN TERMS OF VARIANCE  
 COMPONENTS IN TERMS OF  
 G STUDY UNIVERSE (OF ADMISSIBLE OBSERVATIONS) SIZES D STUDY  
 UNIVERSE (OF GENERALIZATION) SIZES

-----  
 VARIANCE COMPONENTS  
 VARIANCE COMPONENTS  
 VARIANCE FINITE D STUDY FOR MEAN SCORES VARIANCE  
 FINITE D STUDY FOR MEAN SCORES  
 COMPONENTS UNIVERSE SAMPLING ----- COMPONENTS  
 UNIVERSE SAMPLING -----  
 FOR SINGLE COR- FRE- STANDARD FOR SINGLE COR-  
 FRE- STANDARD  
 EFFECT OBSERVATIONS RECTIONS QUENCIES ESTIMATES ERRORS  
 OBSERVATIONS RECTIONS QUENCIES ESTIMATES ERRORS

-----  
 P 0.04542 1.0000 1 0.04542 0.00659 0.04542 1.0000 1  
 0.04542 0.00659

I	4.75496	1.0000	54	0.08805	0.01680	4.75496	1.0000	54
0.08805	0.01680							
PI	0.16322	1.0000	54	0.00302	0.00006	0.16322	1.0000	54
0.00302	0.00006							

-----  
 QFM = QUADRATIC FORM  
 -----

STANDARD  
 STANDARD ERROR OF  
 VARIANCE DEVIATION VARIANCE

UNIVERSE SCORE	0.04542	0.21312	0.00659	
EXPECTED OBSERVED SCORE	0.04844	0.22009	0.00659	
LOWER CASE DELTA	0.00302	0.05498	0.00006	GENERALIZABILITY

COEFFICIENT = 0.93760 (15.02650)

UPPER CASE DELTA	0.09108	0.30179	0.01680	PHI =
------------------	---------	---------	---------	-------

0.33274 ( 0.49868)

MEAN 0.08851 0.29750

-----  
 NOTE: SIGNAL/NOISE RATIOS ARE IN PARENTHESES

GENOVA VERSION 3.1

D STUDY

D-study for IXP

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	0.0000435		
I	0.0000000	0.0002821	
PI	0.0000000	0.0000000	0.0000000

GENOVA VERSION 3.1

CONTROL CARD INPUT LISTING

COLUMN

11111111112222222222333333333344444444445555555555666666666677777777778  
 234567890123456789012345678901234567890123456789012345678901234567890

FINISH

ผลการวิเคราะห์สัมประสิทธิ์การสุรุปอ้างอิง (G-Coefficient)มาตรฐานวัดสมรรถนะครูปฐมวัย  
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AND GENERALIZABILITY ANALYSES WITH BALANCED DESIGNS

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GENOVA VERSION 3.1

PAGE 1

CONTROL CARD INPUT LISTING

COLUMN

1111111111222222222233333333334444444444555555555566666666667777777778

1234567890123456789012345678901234567890123456789012345678901234567890

STUDY Design in this study is i:p  
 COMMENT  
 COMMENT # RECORDS = 107  
 COMMENT # VALUES PER RECORD = 13  
 COMMENT  
 COMMENT # ITEM = 13  
 OPTIONS RECORDS ALL CORRELATION  
 EFFECT \* P 107 0  
 EFFECT + I 13 0  
 FORMAT (13F1.0)  
 PROCESS  
 GENOVA VERSION 3.1

PAGE 2

G STUDY Design in this study is i:p

EXPANDED MAIN AND INTERACTION EFFECT TABLE

(** = INFINITE)	P	I	TOTAL DEGREES		
SAMPLE SIZE	107	13	PRIMARY NUMBER OF		
UNIVERSE SIZE	****	****	INDICES	INDICES	FREEDOM
*****					
*	*	*	*	*	*
* P	* 1	* 0	* 1	1	106
* I	* 0	* 1	* 1	1	12
*	*	*	*	*	*
*****					
*	*	*	*	*	*
* PI	* 1	* 1	* 2	2	1272
*	*	*	*	*	*
*****					

GENOVA VERSION 3.1

PAGE 3

G STUDY

Design in this study is i:p

G STUDY

Design in this study is i:p

CELL MEAN SCORES

\*\*\*\*\*

\*\*\* GRAND MEAN = 2.0366643 \*\*\*

\*\*\*\*\*

MEAN SCORES FOR EFFECT: I	SUBSCRIPT NOTATION: (I)		
(1) = 0.000000E+00	(2) = 4.401869	(3) = 0.000000E+00	(4)
= 4.457944			
(5) = 0.000000E+00	(6) = 4.411215	(7) = 0.000000E+00	(8)
= 4.448598			
(9) = 0.000000E+00	(10) = 4.373832	(11) = 0.000000E+00	(12)
= 4.383178			
(13) = 0.000000E+00			

GENOVA VERSION 3.1

PAGE 11

G STUDY

Design in this study is i:p

ANOVA TABLE

(\*\* = INFINITE) P I  
 SAMPLE SIZE 107 13  
 UNIVERSE SIZE \*\*\*\* \*\*\*\*

	DEGREES	SUMS OF	SUMS OF	MEAN	F	F-
RATIO)	OF	SQUARES FOR	SQUARES FOR	SCORES	SQUARES	TEST
TEST DEGREES OF FREEDOM	FREEDOM	MEAN SCORES	SCORE EFFECTS			
EFFECT	NUMERATOR	DENOMINATOR				
STATISTIC						
P	106	5847.00000	77.13012	0.72764	4.97987	106
1272						
I	12	12502.00935	6732.13947	561.01162	3839.47456	12
1272						
PI	1272	12765.00000	185.86053	0.14612		
MEAN		5769.86988				
TOTAL	1390		6995.13012			

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

GENOVA VERSION 3.1

PAGE 12

G STUDY

Design in this study is i:p

G STUDY RESULTS

(\*\* = INFINITE) P I  
 SAMPLE SIZE 107 13  
 UNIVERSE SIZE \*\*\*\* \*\*\*\*

QFM = QUADRATIC

FORM

```

-----
                MODEL VARIANCE COMPONENTS
          DEGREES  -----
                OF      USING      USING EMS      STANDARD
EFFECT        FREEDOM  ALGORITHM  EQUATIONS      ERROR
-----
P             106      0.0447328   0.0447328      0.0076299
I             12       5.2417337   5.2417337      1.9817053
-----
PI           1272      0.1461168   0.1461168      0.0057894
-----
    
```

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

GENOVA VERSION 3.1

PAGE 13

G STUDY

Design in this study is i:p

EXPECTED MEAN SQUARE EQUATIONS

(\*\* = INFINITE) P I  
 SAMPLE SIZE 107 13  
 UNIVERSE SIZE \*\*\*\* \*\*\*\*  
 EMS(P) = 1.00\*VC(PI) + 13.00\*VC(P)  
 EMS(I) = 1.00\*VC(PI) + 107.00\*VC(I)  
 EMS(PI) = 1.00\*VC(PI)

GENOVA VERSION 3.1

PAGE

G STUDY

Design in this study is i:p

VARIANCE - COVARIANCE MATRIX FOR ESTIMATED VARIANCE

COMPONENTS (V)

	P	I	PI
P	0.0000582		
I	0.0000000	3.9271557	
PI	-0.0000026	-0.0000003	0.0000335

GENOVA VERSION 3.1

PAGE 15

G STUDY

Design in this study is i:p

CORRELATION MATRIX FOR ESTIMATED VARIANCE

COMPONENTS

	P	I	PI
P	1.0000000		
I	0.0000016	1.0000000	
PI	-0.0583671	-0.0000273	1.0000000

GENOVA VERSION 3.1

PAGE 16

CONTROL CARD INPUT LISTING

COLUMN

1111111111222222222233333333333344444444445555555555666666666677777777778

1234567890123456789012345678901234567890123456789012345678901234567890

COMMENT

COMMENT CUMPUTE G-CO

comment analysis of D STUDY

INVALID KEYWORD FOUND ON CONTROL CARD: CARD IMAGE =

comment analysis of D STUDY

DSTUDY D-study for IXP

DEFFECT \$ P

DEFFECT I 13

ENDDSTUDY

GENOVA VERSION 3.1

PAGE 17

D STUDY

D-study for IXP

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 : 107 D STUDY SAMPLE SIZES : 13

-----  
 VARIANCE COMPONENTS IN TERMS OF VARIANCE  
 COMPONENTS IN TERMS OF G STUDY UNIVERSE (OF ADMISSIBLE OBSERVATIONS) SIZES D STUDY  
 UNIVERSE (OF GENERALIZATION) SIZES

-----  
 VARIANCE COMPONENTS  
 VARIANCE COMPONENTS  
 VARIANCE FINITE D STUDY FOR MEAN SCORES VARIANCE  
 FINITE D STUDY FOR MEAN SCORES  
 COMPONENTS UNIVERSE SAMPLING ----- COMPONENTS  
 UNIVERSE SAMPLING -----  
 FOR SINGLE COR- FRE- STANDARD FOR SINGLE COR-  
 FRE- STANDARD  
 EFFECT OBSERVATIONS RECTIONS QUENCIES ESTIMATES ERRORS  
 OBSERVATIONS RECTIONS QUENCIES ESTIMATES ERRORS

-----  
 P 0.04473 1.0000 1 0.04473 0.00763 0.04473 1.0000 1  
 0.04473 0.00763  
 I 5.24173 1.0000 13 0.40321 0.15244 5.24173 1.0000 13  
 0.40321 0.15244  
 PI 0.14612 1.0000 13 0.01124 0.00045 0.14612 1.0000 13  
 0.01124 0.00045

-----  
 QFM = QUADRATIC FORM  
 -----



ศูนย์พัฒนาเด็กเล็กด้านจิตสังเคราะห์ (เฉพาะในส่วนที่สำคัญ)

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 Personnel Research and

Development Center (NPRDC); Robert L. Brennan Principal Investigator. GENOVA does  
 not necessarily



\*\*\*\*\*

\* \* \* \*

\* P \* 1 \* 0 \* 1 1 106

\* I \* 0 \* 1 \* 1 1 6

\* \* \* \*

\*\*\*\*\*

\* \* \* \*

\* PI \* 1 \* 1 \* 2 2 636

\* \* \* \*

\*\*\*\*\*

G STUDY

Design in this study is i:p

CELL MEAN SCORES

\*\*\*\*\*

\*\*\* GRAND MEAN = 1.8210948 \*\*\*

\*\*\*\*\*

MEAN SCORES FOR EFFECT: I

SUBSCRIPT NOTATION: (I)

(1) = 0.000000E+00 (2) = 4.168224 (3) = 0.000000E+00 (4)  
 = 4.345794  
 (5) = 0.000000E+00 (6) = 4.233645 (7) = 0.000000E+00

G STUDY

Design in this study is i:p

ANOVA TABLE

(\*\* = INFINITE) P I

SAMPLE SIZE 107 7

UNIVERSE SIZE \*\*\*\* \*\*\*\*

---

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

---

P	106	2518.57143	34.59813	0.32640	2.53968	106
---	-----	------------	----------	---------	---------	-----



I	6	5.1603102	5.1603102	2.5807557
---	---	-----------	-----------	-----------

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PI	636	0.1285194	0.1285194	0.0071957
----	-----	-----------	-----------	-----------

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NOTE: THE "ALGORITHM" AND "EMS" ESTIMATED VARIANCE COMPONENTS WILL BE

IDENTICAL IF THERE ARE NO NEGATIVE ESTIMATES

G STUDY

Design in this study is i:p

EXPECTED MEAN SQUARE EQUATIONS

(\*\* = INFINITE) P I

SAMPLE SIZE 107 7

UNIVERSE SIZE \*\*\*\* \*

EMS(P) = 1.00\*VC(PI) + 7.00\*VC(P)

EMS(I) = 1.00\*VC(PI) + 107.00\*VC(I)

EMS(PI) = 1.00\*VC(PI)

G STUDY

Design in this study is i:p

VARIANCE - COVARIANCE MATRIX FOR ESTIMATED VARIANCE

COMPONENTS (V)

	P	I	PI
P	0.0000413		
I	0.0000001	6.6602997	
PI	-0.0000074	-0.0000005	0.0000518

G STUDY

Design in this study is i:p

CORRELATION MATRIX FOR ESTIMATED VARIANCE

COMPONENTS

	P	I	PI
P	1.0000000		
I	0.0000042	1.0000000	
PI	-0.1599182	-0.0000261	1.0000000

CONTROL CARD INPUT LISTING

COLUMN

11111111112222222222333333333344444444445555555555666666666677777777778

1234567890123456789012345678901234567890123456789012345678901234567890

COMMENT

COMMENT CUMPUTE G-CO

comment analysis of D STUDY

INVALID KEYWORD FOUND ON CONTROL CARD: CARD IMAGE =

comment analysis of D STUDY

DSTUDY D-study for IXP

DEFFECT \$ P

DEFFECT I 7

ENDDSTUDY

D STUDY

D-study for IXP

D STUDY DESIGN NUMBER 001-001

OBJECT OF MEASUREMENT : P

FACETS : I



PI	0.12852	1.0000	7	0.01836	0.00103	0.12852	1.0000	7
0.01836	0.00103							

---

QFM = QUADRATIC FORM

---

STANDARD

STANDARD ERROR OF

VARIANCE DEVIATION VARIANCE

UNIVERSE SCORE 0.02827 0.16813 0.00643

EXPECTED OBSERVED SCORE 0.04663 0.21594 0.00635

LOWER CASE DELTA 0.01836 0.13550 0.00103 GENERALIZABILITY  
 COEFFICIENT = 0.60625 ( 1.53968)

UPPER CASE DELTA 0.75555 0.86922 0.36868 PHI =  
 0.03606 ( 0.03741)

MEAN 0.73762 0.85885

---

NOTE: SIGNAL/NOISE RATIOS ARE IN PARENTHESES

D STUDY

D-study for IXP

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	0.0000413		
I	0.0000000	0.1359245	
PI	-0.0000011	0.0000000	0.0000011

CONTROL CARD INPUT LISTING

COLUMN

11111111112222222222333333333344444444445555555555666666666677777777778

234567890123456789012345678901234567890123456789012345678901234567890

FINISH

ผลการวิเคราะห์สัมประสิทธิ์การสรุปอ้างอิง (G-Coefficient) มาตรฐานวัดสมรรถนะครูปฐมวัย  
ศูนย์พัฒนาเด็กเล็กด้านจิตสร้างสรรค์ (เฉพาะในส่วนที่สำคัญ)

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

GENOVA has been checked for accuracy of output, however the authors

can make no assurances that the program is totally without error.

GENOVA was developed in part under contract No. N00123-78-C-1206 with the Navy  
Personnel Research and

Development Center (NPRDC); Robert L. Brennan Principal Investigator. GENOVA does  
not necessarily

reflect NPRDC positions or policy, and no official endorsement should be inferred

GENOVA VERSION 3.1

PAGE 1

CONTROL CARD INPUT LISTING

COLUMN

1111111111222222222233333333334444444444555555555566666666667777777778

1234567890123456789012345678901234567890123456789012345678901234567890

STUDY Design in this study is i:p

COMMENT

COMMENT # RECORDS = 107

COMMENT # VALUES PER RECORD = 9

COMMENT

COMMENT # ITEM = 9

OPTIONS RECORDS ALL CORRELATION

EFFECT \* P 107 0

EFFECT + I 9 0

FORMAT (9F1.0)

PROCESS

G STUDY Design in this study is i:p

EXPANDED MAIN AND INTERACTION EFFECT TABLE

(** = INFINITE)	P	I	TOTAL DEGREES
SAMPLE SIZE	107	9	PRIMARY NUMBER OF
UNIVERSE SIZE	****	****	INDICES INDICES FREEDOM

\*\*\*\*\*



(\*\* = INFINITE) P I

SAMPLE SIZE 107 9

UNIVERSE SIZE \*\*\*\* \*\*\*\*

DEGREES SUMS OF SUMS OF (QF = QUASI F  
RATIO)

OF SQUARES FOR SQUARES FOR MEAN F F-  
TEST DEGREES OF FREEDOM

EFFECT FREEDOM MEAN SCORES SCORE EFFECTS SQUARES  
STATISTIC NUMERATOR DENOMINATOR

P 106 3587.00000 52.18692 0.49233 3.74765 106  
848

I 8 7953.41121 4418.59813 552.32477 4204.34060 8  
848

PI 848 8117.00000 111.40187 0.13137

MEAN 3534.81308

TOTAL 962 4582.18692

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

G STUDY

Design in this study is i:p

G STUDY RESULTS

(\*\* = INFINITE) P I

SAMPLE SIZE 107 9

UNIVERSE SIZE \*\*\*\* \*\*\*\*

QFM = QUADRATIC

FORM

-----

MODEL VARIANCE COMPONENTS

DEGREES -----

EFFECT	OF FREEDOM	USING ALGORITHM	USING EMS EQUATIONS	STANDARD ERROR
--------	------------	-----------------	---------------------	----------------

-----

P	106	0.0401066	0.0401066	0.0074778
---	-----	-----------	-----------	-----------

I	8	5.1606859	5.1606859	2.3084780
---	---	-----------	-----------	-----------

-----

PI	848	0.1313701	0.1313701	0.0063724
----	-----	-----------	-----------	-----------

-----

NOTE: THE "ALGORITHM" AND "EMS" ESTIMATED VARIANCE COMPONENTS WILL BE

IDENTICAL IF THERE ARE NO NEGATIVE ESTIMATES

G STUDY

Design in this study is i:p

EXPECTED MEAN SQUARE EQUATIONS

(\*\* = INFINITE) P I

SAMPLE SIZE 107 9

UNIVERSE SIZE \*\*\*\* \*

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

$$\text{EMS}(I) = 1.00 \cdot \text{VC}(PI) + 107.00 \cdot \text{VC}(I)$$

$$\text{EMS}(PI) = 1.00 \cdot \text{VC}(PI)$$

G STUDY

Design in this study is i:p

VARIANCE - COVARIANCE MATRIX FOR ESTIMATED VARIANCE

COMPONENTS (V)

	P	I	PI
P	0.0000559		
I	0.0000000	5.3290706	
PI	-0.0000045	-0.0000004	0.0000406

G STUDY

Design in this study is i:p

## CORRELATION MATRIX FOR ESTIMATED VARIANCE

COMPONENTS

	P	I	PI
P	1.0000000		
I	0.0000024	1.0000000	
PI	-0.0946864	-0.0000258	1.0000000

## CONTROL CARD INPUT LISTING

COLUMN

11111111112222222222333333333344444444445555555555666666666677777777778

234567890123456789012345678901234567890123456789012345678901234567890

COMMENT

COMMENT CUMPUTE G-CO

comment analysis of D STUDY

INVALID KEYWORD FOUND ON CONTROL CARD: CARD IMAGE =

comment analysis of D STUDY

DSTUDY D-study for IXP

DEFFECT \$ P

DEFFECT I 1 2 3 4 5 6 7 8 9 10

ENDDSTUDY

D STUDY

D-study for IXP

D STUDY DESIGN NUMBER 001-009

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

	P	I	PI
P	0.0000559		
I	0.0000000	0.0657910	
PI	-0.0000005	0.0000000	0.0000005

D STUDY

D-study for IXP

D STUDY DESIGN NUMBER 001-010

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 : 107 D STUDY SAMPLE SIZES : 10

VARIANCE COMPONENTS IN TERMS OF VARIANCE  
COMPONENTS IN TERMS OF

G STUDY UNIVERSE (OF ADMISSIBLE OBSERVATIONS) SIZES D STUDY  
UNIVERSE (OF GENERALIZATION) SIZES

VARIANCE COMPONENTS

VARIANCE COMPONENTS

VARIANCE FINITE D STUDY FOR MEAN SCORES VARIANCE  
FINITE D STUDY FOR MEAN SCORES

COMPONENTS UNIVERSE SAMPLING ----- COMPONENTS  
UNIVERSE SAMPLING -----

	FOR SINGLE FRE-	COR-	FRE-	STANDARD	FOR SINGLE FRE-	COR-
EFFECT	OBSERVATIONS	RECTIONS	QUENCIES	ESTIMATES	ERRORS	
OBSERVATIONS	RECTIONS	QUENCIES	ESTIMATES	ERRORS		

---

P	0.04011	1.0000	1	0.04011	0.00748	0.04011	1.0000	1
0.04011	0.00748							
I	5.16069	1.0000	10	0.51607	0.23085	5.16069	1.0000	10
0.51607	0.23085							
PI	0.13137	1.0000	10	0.01314	0.00064	0.13137	1.0000	10
0.01314	0.00064							

---

QFM = QUADRATIC FORM

---

STANDARD

STANDARD ERROR OF

VARIANCE DEVIATION VARIANCE

UNIVERSE SCORE 0.04011 0.20027 0.00748

EXPECTED OBSERVED SCORE 0.05324 0.23075 0.00744

LOWER CASE DELTA 0.01314 0.11462 0.00064

GENERALIZABILITY

COEFFICIENT = 0.75327 ( 3.05295)

UPPER CASE DELTA 0.52921 0.72747 0.23085

PHI =

0.07045 ( 0.07579)

MEAN 0.51657 0.71873

-----

NOTE: SIGNAL/NOISE RATIOS ARE IN PARENTHESES

CONTROL CARD INPUT LISTING

COLUMN

11111111112222222222333333333344444444445555555555666666666677777777778

34567890123456789012345678901234567890123456789012345678901234567890

FINISH

ผลการวิเคราะห์สัมประสิทธิ์การสุปรอ้างอิง (G-Coefficient) มาตรฐานสมรรถนะครูปฐมวัย  
ศูนย์พัฒนาเด็กเล็กด้านจิตรูเการพ (เฉพาะในส่วนที่สำคัญ)

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#### CONTROL CARD INPUT LISTING

COLUMN

11111111112222222222333333333344444444445555555555666666666677777777778

1234567890123456789012345678901234567890123456789012345678901234567890

STUDY     Design in this study is i:p

COMMENT

COMMENT   # RECORDS = 107

COMMENT   # VALUES PER RECORD = 9

COMMENT

COMMENT   # ITEM = 9

OPTIONS   RECORDS ALL   CORRELATION

EFFECT         \* P 107 0

EFFECT   + I 9 0

FORMAT   (9F1.0)

PROCESS

G STUDY

Design in this study is i:p

EXPANDED MAIN AND INTERACTION EFFECT TABLE

(** = INFINITE)	P	I	TOTAL DEGREES
SAMPLE SIZE	107	9	PRIMARY NUMBER OF
UNIVERSE SIZE	****	****	INDICES INDICES FREEDOM

\*\*\*\*\*

*	*	*	*
* P	* 1	* 0	* 1 1 106
* I	* 0	* 1	* 1 1 8

\*\*\*\*\*

*	*	*	*
* PI	* 1	* 1	* 2 2 848

\*\*\*\*\*

\*\*\*\*\*

G STUDY

Design in this study is i:p

CELL MEAN SCORES

\*\*\*\*\*

\*\*\* GRAND MEAN = 1.9169263 \*\*\*

\*\*\*\*\*

MEAN SCORES FOR EFFECT: I

SUBSCRIPT NOTATION: (I)

(1) = 0.000000E+00 (2) = 4.327103 (3) = 0.000000E+00 (4)  
 = 4.327103  
 (5) = 0.000000E+00 (6) = 4.317757 (7) = 0.000000E+00 (8)  
 = 4.280374  
 (9) = 0.000000E+00

G STUDY

Design in this study is i:p

ANOVA TABLE

(\*\* = INFINITE) P I

SAMPLE SIZE 107 9

UNIVERSE SIZE \*\*\*\* \*\*\*\*

-----

	DEGREES	SUMS OF	SUMS OF	MEAN	F	F-
	OF	SQUARES FOR	SQUARES FOR	SCORE		
TEST DEGREES OF FREEDOM				EFFECTS		
EFFECT	FREEDOM	MEAN SCORES	SCORE EFFECTS	SQUARES		
STATISTIC	NUMERATOR	DENOMINATOR				

-----

848 P 106 3587.77778 49.13188 0.46351 3.61410 106

848 I 8 7962.11215 4423.46625 552.93328 4311.37177 8

-----

PI 848 8120.00000 108.75597 0.12825

-----

MEAN 3538.64590

-----

TOTAL 962 4581.35410

-----

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

G STUDY Design in this study is i:p

G STUDY RESULTS

(\*\* = INFINITE) P I

SAMPLE SIZE 107 9

UNIVERSE SIZE \*\*\*\* \*\*\*\* QFM = QUADRATIC

FORM

-----

MODEL VARIANCE COMPONENTS

DEGREES -----

OF USING USING EMS STANDARD

EFFECT	FREEDOM	ALGORITHM	EQUATIONS	ERROR
-----				
P	106	0.0372509	0.0372509	0.0070424
I	8	5.1664022	5.1664022	2.3110213
-----				
PI	848	0.1282500	0.1282500	0.0062210
-----				

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

G STUDY

Design in this study is i:p

## EXPECTED MEAN SQUARE EQUATIONS

(\*\* = INFINITE) P I

SAMPLE SIZE 107 9

UNIVERSE SIZE \*\*\*\* \*\*\*\*

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

$$\text{EMS}(I) = 1.00 \cdot \text{VC}(PI) + 107.00 \cdot \text{VC}(I)$$

$$\text{EMS}(PI) = 1.00 \cdot \text{VC}(PI)$$

G STUDY

Design in this study is i:p

## VARIANCE - COVARIANCE MATRIX FOR ESTIMATED VARIANCE

COMPONENTS (V)

	P	I	PI
P	0.0000496		
I	0.0000000	5.3408195	
PI	-0.0000043	-0.0000004	0.0000387

G STUDY

Design in this study is i:p

## CORRELATION MATRIX FOR ESTIMATED VARIANCE

COMPONENTS

	P	I	PI
P	1.0000000		
I	0.0000025	1.0000000	

PI            -0.0981522   -0.0000252   1.0000000

CONTROL CARD INPUT LISTING

COLUMN

1111111111222222222233333333334444444444555555555566666666667777777778

1234567890123456789012345678901234567890123456789012345678901234567890

COMMENT

COMMENT    CUMPUTE G-CO

comment    analysis of D STUDY

INVALID KEYWORD FOUND ON CONTROL CARD: CARD IMAGE =

comment    analysis of D STUDY

DSTUDY    D-study for IXP

DEFFECT   \$ P

DEFFECT   I 9

ENDDSTUDY

D STUDY

D-study for IXP

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 : 107

D STUDY SAMPLE SIZES : 9

VARIANCE COMPONENTS IN TERMS OF VARIANCE  
COMPONENTS IN TERMS OF

G STUDY UNIVERSE (OF ADMISSIBLE OBSERVATIONS) SIZES D STUDY  
UNIVERSE (OF GENERALIZATION) SIZES

VARIANCE COMPONENTS

VARIANCE COMPONENTS

VARIANCE FINITE D STUDY FOR MEAN SCORES VARIANCE  
FINITE D STUDY FOR MEAN SCORES

COMPONENTS UNIVERSE SAMPLING ----- COMPONENTS  
UNIVERSE SAMPLING -----

FOR SINGLE COR- FRE- STANDARD FOR SINGLE COR-  
FRE- STANDARD

EFFECT OBSERVATIONS RECTIONS QUENCIES ESTIMATES ERRORS  
OBSERVATIONS RECTIONS QUENCIES ESTIMATES ERRORS

P	0.03725	1.0000	1	0.03725	0.00704	0.03725	1.0000	1
0.03725	0.00704							

I	5.16640	1.0000	9	0.57404	0.25678	5.16640	1.0000	9
	0.57404	0.25678						
PI	0.12825	1.0000	9	0.01425	0.00069	0.12825	1.0000	9
	0.01425	0.00069						

---

QFM = QUADRATIC FORM

---

STANDARD

STANDARD ERROR OF

VARIANCE DEVIATION VARIANCE

UNIVERSE SCORE 0.03725 0.19300 0.00704

EXPECTED OBSERVED SCORE 0.05150 0.22694 0.00701

LOWER CASE DELTA 0.01425 0.11937 0.00069 GENERALIZABILITY  
 COEFFICIENT = 0.72331 ( 2.61410)

UPPER CASE DELTA 0.58829 0.76700 0.25678 PHI =  
 0.05955 ( 0.06332)

MEAN 0.57453 0.75797

---

NOTE: SIGNAL/NOISE RATIOS ARE IN PARENTHESES

D STUDY

D-study for IXP

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           0.0000496

I           0.0000000   0.0659360

PI          -0.0000005   0.0000000   0.0000005

## CONTROL CARD INPUT LISTING

## COLUMN

11111111112222222222333333333344444444445555555555666666666677777777778

234567890123456789012345678901234567890123456789012345678901234567890

## FINISH

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G STUDY

Design in this study is i:p

CELL MEAN SCORES

\*\*\*\*\*

\*\*\* GRAND MEAN = 2.0242991 \*\*\*

\*\*\*\*\*

MEAN SCORES FOR EFFECT: I

SUBSCRIPT NOTATION: (I)

(1) =	0.000000E+00	(2) =	4.364486	(3) =	0.000000E+00	(4)
=	4.355140					
(5) =	0.000000E+00	(6) =	4.392523	(7) =	0.000000E+00	(8)
=	4.373832					
(9) =	0.000000E+00	(10) =	4.345794	(11) =	0.000000E+00	(12)
=	4.299065					
(13) =	0.000000E+00	(14) =	4.233645	(15) =	0.000000E+00	

ANOVA TABLE

(\*\* = INFINITE) P I  
 SAMPLE SIZE 107 15  
 UNIVERSE SIZE \*\*\*\* \*\*\*\*

---

	DEGREES	SUMS OF	SUMS OF		(QF = QUASI F	
RATIO)						
	OF	SQUARES FOR	SQUARES FOR	MEAN	F	F-
TEST DEGREES OF FREEDOM						
EFFECT	FREEDOM	MEAN SCORES	SCORE EFFECTS	SQUARES		
STATISTIC	NUMERATOR	DENOMINATOR				
P	106	6663.26667	86.31900	0.81433	6.18692	106
1484						
I	14	14095.35514	7518.40748	537.02911	4080.11108	14
1484						
PI	1484	14377.00000	195.32586	0.13162		
MEAN		6576.94766				
TOTAL	1604		7800.05234			

---

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

G STUDY Design in this study is i:p

G STUDY RESULTS

(\*\* = INFINITE) P I

SAMPLE SIZE 107 15

UNIVERSE SIZE \*\*\*\* \*\*\*\* QFM = QUADRATIC

FORM

-----

MODEL VARIANCE COMPONENTS

DEGREES -----

EFFECT	OF FREEDOM	USING ALGORITHM	USING EMS EQUATIONS	STANDARD ERROR
--------	------------	-----------------	---------------------	----------------

-----

P	106	0.0455139	0.0455139	0.0073948
---	-----	-----------	-----------	-----------

I	14	5.0177335	5.0177335	1.7744716
---	----	-----------	-----------	-----------

-----

PI	1484	0.1316212	0.1316212	0.0048287
----	------	-----------	-----------	-----------

-----

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

G STUDY Design in this study is i:p

EXPECTED MEAN SQUARE EQUATIONS

(\*\* = INFINITE) P I

SAMPLE SIZE 107 15

UNIVERSE SIZE \*\*\*\* \*\*

$$\text{EMS}(P) = 1.00 \cdot \text{VC}(PI) + 15.00 \cdot \text{VC}(P)$$

$$\text{EMS}(I) = 1.00 \cdot \text{VC}(PI) + 107.00 \cdot \text{VC}(I)$$

$$\text{EMS}(PI) = 1.00 \cdot \text{VC}(PI)$$

G STUDY

Design in this study is i:p

VARIANCE - COVARIANCE MATRIX FOR ESTIMATED VARIANCE

COMPONENTS (V)

	P	I	PI
P	0.0000547		
I	0.0000000	3.1487495	
PI	-0.0000016	-0.0000002	0.0000233

G STUDY

Design in this study is i:p

CORRELATION MATRIX FOR ESTIMATED VARIANCE

COMPONENTS

	P	I	PI
P	1.0000000		
I	0.0000011	1.0000000	
PI	-0.0435327	-0.0000254	1.0000000

CONTROL CARD INPUT LISTING

COLUMN

1111111111222222222233333333333344444444445555555555666666666677777777778

234567890123456789012345678901234567890123456789012345678901234567890123456789

COMMENT

COMMENT CUMPUTE G-CO

comment analysis of D STUDY

INVALID KEYWORD FOUND ON CONTROL CARD: CARD IMAGE =

comment analysis of D STUDY

DSTUDY D-study for IXP

DEFFECT \$ P

DEFFECT I 15

ENDDSTUDY

D STUDY D-study for IXP

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 : 107 D STUDY SAMPLE SIZES : 15

VARIANCE COMPONENTS IN TERMS OF VARIANCE  
COMPONENTS IN TERMS OF

G STUDY UNIVERSE (OF ADMISSIBLE OBSERVATIONS) SIZES D STUDY  
UNIVERSE (OF GENERALIZATION) SIZES

VARIANCE COMPONENTS

VARIANCE COMPONENTS

VARIANCE FINITE D STUDY FOR MEAN SCORES VARIANCE  
FINITE D STUDY FOR MEAN SCORES

COMPONENTS UNIVERSE SAMPLING ----- COMPONENTS  
UNIVERSE SAMPLING -----

FOR SINGLE COR- FRE- STANDARD FOR SINGLE COR-  
FRE- STANDARD

EFFECT OBSERVATIONS RECTIONS QUENCIES ESTIMATES ERRORS  
OBSERVATIONS RECTIONS QUENCIES ESTIMATES ERRORS

P	0.04551	1.0000	1	0.04551	0.00739	0.04551	1.0000	1
0.04551	0.00739							

I	5.01773	1.0000	15	0.33452	0.11830	5.01773	1.0000	15
	0.33452	0.11830						
PI	0.13162	1.0000	15	0.00877	0.00032	0.13162	1.0000	15
	0.00877	0.00032						

---

QFM = QUADRATIC FORM

---

STANDARD

STANDARD ERROR OF

VARIANCE DEVIATION VARIANCE

UNIVERSE SCORE 0.04551 0.21334 0.00739

EXPECTED OBSERVED SCORE 0.05429 0.23300 0.00739

LOWER CASE DELTA 0.00877 0.09367 0.00032 GENERALIZABILITY  
 COEFFICIENT = 0.83837 ( 5.18692)

UPPER CASE DELTA 0.34329 0.58591 0.11830 PHI =  
 0.11706 ( 0.13258)

MEAN 0.33502 0.57881

---

NOTE: SIGNAL/NOISE RATIOS ARE IN PARENTHESES

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

	P	I	PI
P	0.0000547		
I	0.0000000	0.0139944	

PI            -0.0000001    0.0000000    0.0000001

CONTROL CARD INPUT LISTING

COLUMN

1111111111222222222233333333334444444444555555555566666666667777777778

1234567890123456789012345678901234567890123456789012345678901234567890

FINISH