ภาคผนวก ซ

ผลการวิเคราะห์สัมประสิทธิ์การสรุปอ้างอิง (G-Coefficient)มาตรวัดสมรรถนะครูปฐมวัย
ศูนย์พัฒนาเด็กเล็ก

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A GENERAL PURPOSE ANALYSIS OF VARIANCE SYSTEM

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

AUTHORS

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Director, Iowa Testing Program

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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
1111111111222222222233333333334444444444555555555566666666667777777778
 12345678901234567890123456789012345678901234567890123456789012345678901234567890
   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 (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 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

M O D E L V A R I A N C E C O M P O N E N T S

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

P 106 0.0454180 0.0454180 0.0065922
I 53 4.7549571 4.7549571 0.9070256

```
--------------------------------------------------------------------------------
PI          5618      0.1632165       0.1632165       0.0030790
--------------------------------------------------------------------------------
```

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

1111111111222222222233333333334444444444555555555566666666667777777778

```
12345678901234567890123456789012345678901234567890123456789012345678901234567890
  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

1111111111222222222233333333334444444444555555555566666666667777777778

2345678901234567890123456789012345678901234567890123456789012345678901234567890

FINISH

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```
  GENOVA  VERSION 3.1
PAGE       1
                                        CONTROL CARD INPUT LISTING
  COLUMN
11111111112222222222333333333344444444445555555555666666666677777777778

12345678901234567890123456789012345678901234567890123456789012345678901234567890
  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 **** ****

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

M O D E L V A R I A N C E C O M P O N E N T S

EFFECT	DEGREES OF FREEDOM	USING ALGORITHM	USING EMS EQUATIONS	STANDARD 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
1111111111222222222233333333334444444444555555555566666666667777777778

12345678901234567890123456789012345678901234567890123456789012345678901234567890
  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

STANDARD

STANDARD ERROR OF

VARIANCE DEVIATION VARIANCE

UNIVERSE SCORE 0.04473 0.21150 0.00763

EXPECTED OBSERVED SCORE 0.05597 0.23659 0.00762

LOWER CASE DELTA 0.01124 0.10602 0.00045 GENERALIZABILITY COEFFICIENT = 0.79919 (3.97987)

UPPER CASE DELTA 0.41445 0.64378 0.15244 PHI = 0.09742 (0.10793)

MEAN 0.40373 0.63540

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	0.0000582		
I	0.0000000	0.0232376	
PI	-0.0000002	0.0000000	0.0000002

GENOVA VERSION 3.1

PAGE

CONTROL CARD INPUT LISTING

COLUMN

1111111111222222222233333333334444444444555555555566666666667777777778

1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890

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```
   GENOVA  VERSION 3.1
CONTROL CARD INPUT LISTING

   COLUMN
1111111111222222222233333333334444444444555555555566666666667777777778

2345678901234567890123456789012345678901234567890123456789012345678901234567890

   STUDY       Design in this study is i:p

   COMMENT

   COMMENT     # RECORDS = 107

   COMMENT     # VALUES PER RECORD = 7

   COMMENT

   COMMENT     # ITEM = 7

   OPTIONS     RECORDS ALL   CORRELATION

   EFFECT             * P 107 0

   EFFECT      + I 7 0

   FORMAT      (7F1.0)

   PROCESS

   GENOVA  VERSION 3.1
STUDY                          Design in this study is i:p

                               EXPANDED MAIN AND INTERACTION EFFECT TABLE

       (** = INFINITE)    P         I               TOTAL    DEGREES

       SAMPLE SIZE      107         7        PRIMARY  NUMBER     OF

       UNIVERSE SIZE    ****      ****        INDICES  INDICES  FREEDOM
```

```
************************************
*           *       *       *
* 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)

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

EFFECT FREEDOM MEAN SCORES SCORE EFFECTS SQUARES STATISTIC NUMERATOR DENOMINATOR

P 106 2518.57143 34.59813 0.32640 2.53968 106 636

I 6 5797.66355 3313.69025 552.28171 4297.26445 6
636

PI 636 5914.00000 81.73832 0.12852

MEAN 2483.97330

TOTAL 748 3430.02670

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 7

UNIVERSE SIZE **** **** QFM = QUADRATIC
FORM

M O D E L V A R I A N C E C O M P O N E N T S

DEGREES -

OF USING USING EMS STANDARD

EFFECT FREEDOM ALGORITHM EQUATIONS ERROR

P 106 0.0282683 0.0282683 0.0064280

I 6 5.1603102 5.1603102 2.5807557

PI 636 0.1285194 0.1285194 0.0071957

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
1111111111222222222233333333334444444444555555555566666666667777777778
 12345678901234567890123456789012345678901234567890123456789012345678901234567890
  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

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 : 7

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 0.02827 1.0000 1 0.02827 0.00643 0.02827 1.0000 1 0.02827 0.00643

I 5.16031 1.0000 7 0.73719 0.36868 5.16031 1.0000 7 0.73719 0.36868

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
1111111111222222222233333333334444444444555555555566666666667777777778
 2345678901234567890123456789012345678901234567890123456789012345678901234567890
  FINISH
```

ผลการวิเคราะห์สัมประสิทธิ์การสรุปอ้างอิง (G-Coefficient)มาตรวัดสมรรถนะครูปฐมวัย ศูนย์พัฒนาเด็กเล็กด้านจิตสร้างสรรค์ (เฉพาะในส่วนที่สำคัญ)

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GENOVA IS A FORTRAN 77 PROGRAM FOR ANALYSIS OF VARIANCE

AND GENERALIZABILITY ANALYSES WITH BALANCED DESIGNS

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Robert L. Brennan, Ed.D.

Director, Iowa Testing Program

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VERSION 3.1

January, 2001

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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
11111111112222222222333333333344444444445555555555666666666677777777778
12345678901234567890123456789012345678901234567890123456789012345678901234567890
  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

G STUDY Design in this study is i:p

CELL MEAN SCORES

```
*******************************************************************************

                              *** GRAND MEAN =          1.9158879 ***

*******************************************************************************
```

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

(1) = 0.000000E+00 (2) = 4.317757 (3) = 0.000000E+00 (4) = 4.308411

(5) = 0.000000E+00 (6) = 4.327103 (7) = 0.000000E+00 (8) = 4.289720

(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 (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

M O D E L V A R I A N C E C O M P O N E N T S

EFFECT	DEGREES 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 **** ****

EMS(P) = 1.00*VC(PI) + 9.00*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	0.0000559		
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
1111111111222222222233333333334444444444555555555566666666667777777778
  2345678901234567890123456789012345678901234567890123456789012345678901234567890
  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 ---

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

	VARIANCE	STANDARD DEVIATION	STANDARD ERROR OF 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
UPPER CASE DELTA	0.52921	0.72747	0.23085
MEAN	0.51657	0.71873	

GENERALIZABILITY COEFFICIENT = 0.75327 (3.05295)

PHI = 0.07045 (0.07579)

NOTE: SIGNAL/NOISE RATIOS ARE IN PARENTHESES

CONTROL CARD INPUT LISTING

COLUMN

1111111111222222222233333333334444444444555555555566666666667777777778

3456789012345678901234567890123456789012345678901234567890123456789012345678901234567890

FINISH

ผลการวิเคราะห์สัมประสิทธิ์การสรุปอ้างอิง (G-Coefficient) มาตรวัดสมรรถนะครูปฐมวัย ศูนย์พัฒนาเด็กเล็กด้านจิตรู้เคารพ (เฉพาะในส่วนที่สำคัญ)

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CONTROL CARD INPUT LISTING

```
  COLUMN
1111111111222222222233333333334444444444555555555566666666667777777778
 12345678901234567890123456789012345678901234567890123456789012345678901234567890
  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 INDICES	DEGREES OF FREEDOM
SAMPLE SIZE	107	9	PRIMARY INDICES	NUMBER
UNIVERSE SIZE	****	****		
P	1	0	1	106
I	0	1	1	8
PI	1	1	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 (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 3587.77778 49.13188 0.46351 3.61410 106
848

I 8 7962.11215 4423.46625 552.93328 4311.37177 8
848

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

M O D E L V A R I A N C E C O M P O N E N T S

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 **** ****

EMS(P) = 1.00*VC(PI) + 9.00*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	0.0000496		
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
11111111112222222222333333333344444444455555555556666666666777777777 8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
  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

1111111111222222222233333333334444444444555555555566666666667777777778

2345678901234567890123456789012345678901234567890123456789012345678901234567890

FINISH

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Iowa City, Iowa 52242

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January, 2001

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

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

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

M O D E L V A R I A N C E C O M P O N E N T S

EFFECT	DEGREES 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 **** ****

EMS(P) = 1.00*VC(PI) + 15.00*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	0.0000547		
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

1111111111222222222233333333334444444444555555555566666666667777777778

```
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
12345678901234567890123456789012345678901234567890123456789012345678901234567890
  FINISH
```