GGGGGGGGGG EEEEEEEEEEEE NN NN OOOOOOOO VV VV AAAAAAAAAA

GGGGGGGGGGGG EEEEEEEEEEEE NNN NN OOOOOOOOOO VV VV AAAAAAAAAAAA

GG G EE NNNN NN OO OO VV VV AA AA

GG EE NN NN NN OO OO VV VV AA AA

GG EE NN NN NN OO OO VV VV AA AA

GG EE NN NN NN OO OO VV VV AA AA

GG EE NN NN NN OO OO VV VV AA AA

GG EEEEEEEE NN NN NN OO OO VV VV AA AA

GG GGGG EEEEEEEE NN NNNN OO OO VV VV AAAAAAAAAAAA

GG GGGG EE NN NNN OO OO VV VV AAAAAAAAAAAA

GG GG EE NN NN OO OO VV VV AA AA

GG GG EE NN NN OO OO VV VV AA AA

GG GG EE NN NN OO OO V V AA AA

GG GG EE NN NN OO OO VVVV AA AA

GGGGGGGGGGGG EEEEEEEEEEEE NN NN OOOOOOOOOO VVVV AA AA

GGGGGGGGGG EEEEEEEEEEEE NN NN OOOOOOOO 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 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 11111111112222222222333333333344444444445555555555666666666677777777778

12345678901234567890123456789012345678901234567890123456789012345678901234567890

GSTUDY P X (R:T) DESIGN -- RANDOM MODEL

OPTIONS RECORDS 2

EFFECT \* P 10 0

EFFECT + T 3 0

EFFECT + R:T 4 0

FORMAT (12F2.0)

PROCESS

GENOVA VERSION 3.1 PAGE 2

G STUDY P X (R:T) DESIGN -- RANDOM MODEL

EXPANDED MAIN AND INTERACTION EFFECT TABLE

(\*\* = INFINITE) P T R TOTAL DEGREES

SAMPLE SIZE 10 3 4 PRIMARY NUMBER OF

UNIVERSE SIZE \*\*\*\* \*\*\*\* \*\*\*\* INDICES INDICES FREEDOM

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\* \* \* \* \*

\* P \* 1 \* 0 \* 0 \* 1 1 9

\* T \* 0 \* 1 \* 0 \* 1 1 2

\* R:T \* 0 \* 2 \* 1 \* 1 2 9

\* \* \* \* \*

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\* \* \* \* \*

\* PT \* 1 \* 1 \* 0 \* 2 2 18

\* PR:T \* 1 \* 2 \* 1 \* 2 3 81

\* \* \* \* \*

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

GENOVA VERSION 3.1 PAGE 3

G STUDY P X (R:T) DESIGN -- RANDOM MODEL

INPUT RECORD LISTING WITH RECORD MEANS

RECORD # 1 5.00000 6.00000 5.00000 5.00000 5.00000 3.00000 4.00000 5.00000

6.00000 7.00000 3.00000 3.00000 4.75000

RECORD # 2 9.00000 3.00000 7.00000 7.00000 7.00000 5.00000 5.00000 5.00000

7.00000 7.00000 5.00000 2.00000 5.75000

RECORD # 9 9.00000 9.00000 8.00000 8.00000 6.00000 6.00000 6.00000 5.00000

5.00000 8.00000 1.00000 1.00000 6.00000

RECORD # 10 4.00000 4.00000 4.00000 3.00000 3.00000 5.00000 6.00000 5.00000

5.00000 7.00000 1.00000 1.00000 4.00000

GENOVA VERSION 3.1 PAGE 4

G STUDY P X (R:T) DESIGN -- RANDOM MODEL

CELL MEAN SCORES

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\*\*\* GRAND MEAN = 4.7500000 \*\*\*

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

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

(1) = 5.500000 (2) = 4.800000 (3) = 3.950000

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

MEAN SCORES FOR EFFECT: R:T SUBSCRIPT NOTATION: (T,R)

(1,1) = 6.100000 (1,2) = 4.800000 (1,3) = 5.600000 (1,4) = 5.500000

(2,1) = 5.300000 (2,2) = 4.300000 (2,3) = 4.700000 (2,4) = 4.900000

(3,1) = 4.800000 (3,2) = 5.600000 (3,3) = 2.600000 (3,4) = 2.800000

GENOVA VERSION 3.1 PAGE 5

G STUDY P X (R:T) DESIGN -- RANDOM MODEL

ANOVA TABLE

(\*\* = INFINITE) P T R

SAMPLE SIZE 10 3 4

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 9 2800.16667 92.66667 10.29630 2.22935 9 18

T 2 2755.70000 48.20000 24.10000 2.17238 QF 2 QF 12 QF

R:T 9 2835.40000 79.70000 8.85556 3.72044 9 81

------------------------------------------------------------------------------------------------------------------

PT 18 2931.50000 83.13333 4.61852 1.94035 18 81

PR:T 81 3204.00000 192.80000 2.38025

------------------------------------------------------------------------------------------------------------------

MEAN 2707.50000

------------------------------------------------------------------------------------------------------------------

TOTAL 119 496.50000

------------------------------------------------------------------------------------------------------------------

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

GENOVA VERSION 3.1 PAGE 6

G STUDY P X (R:T) DESIGN -- RANDOM MODEL

G STUDY RESULTS

(\*\* = INFINITE) P T R

SAMPLE SIZE 10 3 4

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 9 .4731481 .4731481 .3855758

T 2 .3251543 .3251543 .4379875

R:T 9 .6475309 .6475309 .3794056

-----------------------------------------------------------------------------

PT 18 .5595679 .5595679 .3766291

PR:T 81 2.3802469 2.3802469 .3694860

-----------------------------------------------------------------------------

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

IDENTICAL IF THERE ARE NO NEGATIVE ESTIMATES

GENOVA VERSION 3.1 PAGE 7

G STUDY P X (R:T) DESIGN -- RANDOM MODEL

EXPECTED MEAN SQUARE EQUATIONS

(\*\* = INFINITE) P T R

SAMPLE SIZE 10 3 4

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

EMS(P) = 1.00\*VC(PR:T) + 4.00\*VC(PT) + 12.00\*VC(P)

EMS(T) = 1.00\*VC(PR:T) + 4.00\*VC(PT) + 10.00\*VC(R:T) + 40.00\*VC(T)

EMS(R:T) = 1.00\*VC(PR:T) + 10.00\*VC(R:T)

EMS(PT) = 1.00\*VC(PR:T) + 4.00\*VC(PT)

EMS(PR:T) = 1.00\*VC(PR:T)

GENOVA VERSION 3.1 PAGE 8

G STUDY P X (R:T) DESIGN -- RANDOM MODEL

VARIANCE - COVARIANCE MATRIX FOR ESTIMATED VARIANCE COMPONENTS (V)

P T R:T PT PR:T

P .1486687

T .0044439 .1918331

R:T .0000000 -.0359871 .1439486

PT -.0444390 -.0141849 .0034130 .1418495

PR:T .0000000 .0034130 -.0136520 -.0341300 .1365199

GENOVA VERSION 3.1 PAGE 9

CONTROL CARD INPUT LISTING

COLUMN 11111111112222222222333333333344444444445555555555666666666677777777778

12345678901234567890123456789012345678901234567890123456789012345678901234567890

COMMENT

COMMENT What if we vary the number of raters?

DSTUDY #1 -- P X (R:T) DESIGN -- R AND T RANDOM

DEFFECT $ P

DEFFECT T 3

DEFFECT R:T 1 2 3 4

ENDDSTUDY

GENOVA VERSION 3.1 PAGE 10

D STUDY #1 -- P X (R:T) DESIGN -- R AND T RANDOM

D STUDY DESIGN NUMBER 001-001

OBJECT OF MEASUREMENT : P FACETS : T R:T

G STUDY POPULATION SIZE : INFINITE G STUDY UNIVERSE SIZES : INFINITE INFINITE

D STUDY POPULATION SIZE : INFINITE D STUDY UNIVERSE SIZES : INFINITE INFINITE

D STUDY SAMPLE SIZE : 10 D STUDY SAMPLE SIZES : 3 1

----------------------------------------------------------------------------------------------------------------------------------

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 .47315 1.0000 1 .47315 .38558 .47315 1.0000 1 .47315 .38558

T .32515 1.0000 3 .10838 .14600 .32515 1.0000 3 .10838 .14600

R:T .64753 1.0000 3 .21584 .12647 .64753 1.0000 3 .21584 .12647

PT .55957 1.0000 3 .18652 .12554 .55957 1.0000 3 .18652 .12554

PR:T 2.38025 1.0000 3 .79342 .12316 2.38025 1.0000 3 .79342 .12316

----------------------------------------------------------------------------------------------------------------------------------

QFM = QUADRATIC FORM

----------------------------------------------------------------------------------------------------------------------------------

STANDARD

STANDARD ERROR OF

VARIANCE DEVIATION VARIANCE

UNIVERSE SCORE .47315 .68786 .38558

EXPECTED OBSERVED SCORE 1.45309 1.20544 .37734

LOWER CASE DELTA .97994 .98992 .15279 GENERALIZABILITY COEFFICIENT = .32562 ( .48283)

UPPER CASE DELTA 1.30417 1.14200 .21906 PHI = .26622 ( .36280)

MEAN .46954 .68523

----------------------------------------------------------------------------------------------------------------------------------

NOTE: SIGNAL/NOISE RATIOS ARE IN PARENTHESES

GENOVA VERSION 3.1 PAGE 11

D STUDY #1 -- P X (R:T) DESIGN -- R AND T RANDOM

D STUDY DESIGN NUMBER 001-001

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

P T R:T PT PR:T

P .1486687

T .0014813 .0213148

R:T .0000000 -.0039986 .0159943

PT -.0148130 -.0015761 .0003792 .0157611

PR:T .0000000 .0003792 -.0015169 -.0037922 .0151689

GENOVA VERSION 3.1 PAGE 12

D STUDY #1 -- P X (R:T) DESIGN -- R AND T RANDOM

D STUDY DESIGN NUMBER 001-002

OBJECT OF MEASUREMENT : P FACETS : T R:T

G STUDY POPULATION SIZE : INFINITE G STUDY UNIVERSE SIZES : INFINITE INFINITE

D STUDY POPULATION SIZE : INFINITE D STUDY UNIVERSE SIZES : INFINITE INFINITE

D STUDY SAMPLE SIZE : 10 D STUDY SAMPLE SIZES : 3 2

----------------------------------------------------------------------------------------------------------------------------------

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 .47315 1.0000 1 .47315 .38558 .47315 1.0000 1 .47315 .38558

T .32515 1.0000 3 .10838 .14600 .32515 1.0000 3 .10838 .14600

R:T .64753 1.0000 6 .10792 .06323 .64753 1.0000 6 .10792 .06323

PT .55957 1.0000 3 .18652 .12554 .55957 1.0000 3 .18652 .12554

PR:T 2.38025 1.0000 6 .39671 .06158 2.38025 1.0000 6 .39671 .06158

----------------------------------------------------------------------------------------------------------------------------------

QFM = QUADRATIC FORM

----------------------------------------------------------------------------------------------------------------------------------

STANDARD

STANDARD ERROR OF

VARIANCE DEVIATION VARIANCE

UNIVERSE SCORE .47315 .68786 .38558

EXPECTED OBSERVED SCORE 1.05638 1.02780 .36716

LOWER CASE DELTA .58323 .76370 .12554 GENERALIZABILITY COEFFICIENT = .44790 ( .81125)

UPPER CASE DELTA .79954 .89417 .18418 PHI = .37177 ( .59178)

MEAN .32194 .56740

----------------------------------------------------------------------------------------------------------------------------------

NOTE: SIGNAL/NOISE RATIOS ARE IN PARENTHESES

GENOVA VERSION 3.1 PAGE 13

D STUDY #1 -- P X (R:T) DESIGN -- R AND T RANDOM

D STUDY DESIGN NUMBER 001-002

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

P T R:T PT PR:T

P .1486687

T .0014813 .0213148

R:T .0000000 -.0019993 .0039986

PT -.0148130 -.0015761 .0001896 .0157611

PR:T .0000000 .0001896 -.0003792 -.0018961 .0037922

GENOVA VERSION 3.1 PAGE 14

D STUDY #1 -- P X (R:T) DESIGN -- R AND T RANDOM

D STUDY DESIGN NUMBER 001-003

OBJECT OF MEASUREMENT : P FACETS : T R:T

G STUDY POPULATION SIZE : INFINITE G STUDY UNIVERSE SIZES : INFINITE INFINITE

D STUDY POPULATION SIZE : INFINITE D STUDY UNIVERSE SIZES : INFINITE INFINITE

D STUDY SAMPLE SIZE : 10 D STUDY SAMPLE SIZES : 3 3

----------------------------------------------------------------------------------------------------------------------------------

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 .47315 1.0000 1 .47315 .38558 .47315 1.0000 1 .47315 .38558

T .32515 1.0000 3 .10838 .14600 .32515 1.0000 3 .10838 .14600

R:T .64753 1.0000 9 .07195 .04216 .64753 1.0000 9 .07195 .04216

PT .55957 1.0000 3 .18652 .12554 .55957 1.0000 3 .18652 .12554

PR:T 2.38025 1.0000 9 .26447 .04105 2.38025 1.0000 9 .26447 .04105

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QFM = QUADRATIC FORM

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STANDARD

STANDARD ERROR OF

VARIANCE DEVIATION VARIANCE

UNIVERSE SCORE .47315 .68786 .38558

EXPECTED OBSERVED SCORE .92414 .96132 .36601

LOWER CASE DELTA .45099 .67156 .12214 GENERALIZABILITY COEFFICIENT = .51199 ( 1.04912)

UPPER CASE DELTA .63133 .79456 .17989 PHI = .42839 ( .74945)

MEAN .27275 .52225

----------------------------------------------------------------------------------------------------------------------------------

NOTE: SIGNAL/NOISE RATIOS ARE IN PARENTHESES

GENOVA VERSION 3.1 PAGE 15

D STUDY #1 -- P X (R:T) DESIGN -- R AND T RANDOM

D STUDY DESIGN NUMBER 001-003

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

P T R:T PT PR:T

P .1486687

T .0014813 .0213148

R:T .0000000 -.0013329 .0017771

PT -.0148130 -.0015761 .0001264 .0157611

PR:T .0000000 .0001264 -.0001685 -.0012641 .0016854

GENOVA VERSION 3.1 PAGE 16

D STUDY #1 -- P X (R:T) DESIGN -- R AND T RANDOM

D STUDY DESIGN NUMBER 001-004

OBJECT OF MEASUREMENT : P FACETS : T R:T

G STUDY POPULATION SIZE : INFINITE G STUDY UNIVERSE SIZES : INFINITE INFINITE

D STUDY POPULATION SIZE : INFINITE D STUDY UNIVERSE SIZES : INFINITE INFINITE

D STUDY SAMPLE SIZE : 10 D STUDY SAMPLE SIZES : 3 4

----------------------------------------------------------------------------------------------------------------------------------

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 .47315 1.0000 1 .47315 .38558 .47315 1.0000 1 .47315 .38558

T .32515 1.0000 3 .10838 .14600 .32515 1.0000 3 .10838 .14600

R:T .64753 1.0000 12 .05396 .03162 .64753 1.0000 12 .05396 .03162

PT .55957 1.0000 3 .18652 .12554 .55957 1.0000 3 .18652 .12554

PR:T 2.38025 1.0000 12 .19835 .03079 2.38025 1.0000 12 .19835 .03079

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QFM = QUADRATIC FORM

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STANDARD

STANDARD ERROR OF

VARIANCE DEVIATION VARIANCE

UNIVERSE SCORE .47315 .68786 .38558

EXPECTED OBSERVED SCORE .85802 .92630 .36586

LOWER CASE DELTA .38488 .62038 .12171 GENERALIZABILITY COEFFICIENT = .55144 ( 1.22935)

UPPER CASE DELTA .54722 .73974 .17935 PHI = .46370 ( .86464)

MEAN .24815 .49814

----------------------------------------------------------------------------------------------------------------------------------

NOTE: SIGNAL/NOISE RATIOS ARE IN PARENTHESES

GENOVA VERSION 3.1 PAGE 17

D STUDY #1 -- P X (R:T) DESIGN -- R AND T RANDOM

D STUDY DESIGN NUMBER 001-004

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

P T R:T PT PR:T

P .1486687

T .0014813 .0213148

R:T .0000000 -.0009996 .0009996

PT -.0148130 -.0015761 .0000948 .0157611

PR:T .0000000 .0000948 -.0000948 -.0009481 .0009481

GENOVA VERSION 3.1 PAGE 18

D STUDY #1 -- P X (R:T) DESIGN -- R AND T RANDOM

SUMMARY OF D STUDY RESULTS FOR SET OF CONTROL CARDS NO. 001

---------------------------------------------------------------------------------------------------------------------------------

V A R I A N C E S

SAMPLE SIZES --------------------------------------------------------

D STUDY ------------------------------------- EXPECTED LOWER UPPER

DESIGN INDEX= $P T R UNIVERSE OBSERVED CASE CASE GEN.

NO UNIV.= INF. INF. INF. SCORE SCORE DELTA DELTA MEAN COEF. PHI

---------------------------------------------------------------------------------------------------------------------------------

001-001 10 3 1 .47315 1.45309 .97994 1.30417 .46954 .32562 .26622

001-002 10 3 2 .47315 1.05638 .58323 .79954 .32194 .44790 .37177

001-003 10 3 3 .47315 .92414 .45099 .63133 .27275 .51199 .42839

001-004 10 3 4 .47315 .85802 .38488 .54722 .24815 .55144 .46370

GENOVA VERSION 3.1 PAGE 19

CONTROL CARD INPUT LISTING

COLUMN 11111111112222222222333333333344444444445555555555666666666677777777778

12345678901234567890123456789012345678901234567890123456789012345678901234567890

COMMENT

COMMENT What if we vary the number of tasks?

DSTUDY #2 -- P X (R:T) DESIGN -- R AND T RANDOM

DEFFECT $ P

DEFFECT T 2 3 4 5 6

DEFFECT R:T 2

ENDDSTUDY

GENOVA VERSION 3.1 PAGE 20

D STUDY #2 -- P X (R:T) DESIGN -- R AND T RANDOM

D STUDY DESIGN NUMBER 002-001

OBJECT OF MEASUREMENT : P FACETS : T R:T

G STUDY POPULATION SIZE : INFINITE G STUDY UNIVERSE SIZES : INFINITE INFINITE

D STUDY POPULATION SIZE : INFINITE D STUDY UNIVERSE SIZES : INFINITE INFINITE

D STUDY SAMPLE SIZE : 10 D STUDY SAMPLE SIZES : 2 2

----------------------------------------------------------------------------------------------------------------------------------

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 .47315 1.0000 1 .47315 .38558 .47315 1.0000 1 .47315 .38558

T .32515 1.0000 2 .16258 .21899 .32515 1.0000 2 .16258 .21899

R:T .64753 1.0000 4 .16188 .09485 .64753 1.0000 4 .16188 .09485

PT .55957 1.0000 2 .27978 .18831 .55957 1.0000 2 .27978 .18831

PR:T 2.38025 1.0000 4 .59506 .09237 2.38025 1.0000 4 .59506 .09237

----------------------------------------------------------------------------------------------------------------------------------

QFM = QUADRATIC FORM

----------------------------------------------------------------------------------------------------------------------------------

STANDARD

STANDARD ERROR OF

VARIANCE DEVIATION VARIANCE

UNIVERSE SCORE .47315 .68786 .38558

EXPECTED OBSERVED SCORE 1.34799 1.16103 .37375

LOWER CASE DELTA .87485 .93533 .18831 GENERALIZABILITY COEFFICIENT = .35100 ( .54084)

UPPER CASE DELTA 1.19931 1.09513 .27628 PHI = .28291 ( .39452)

MEAN .45926 .67769

----------------------------------------------------------------------------------------------------------------------------------

NOTE: SIGNAL/NOISE RATIOS ARE IN PARENTHESES

GENOVA VERSION 3.1 PAGE 21

D STUDY #2 -- P X (R:T) DESIGN -- R AND T RANDOM

D STUDY DESIGN NUMBER 002-001

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

P T R:T PT PR:T

P .1486687

T .0022219 .0479583

R:T .0000000 -.0044984 .0089968

PT -.0222195 -.0035462 .0004266 .0354624

PR:T .0000000 .0004266 -.0008532 -.0042662 .0085325

GENOVA VERSION 3.1 PAGE 22

D STUDY #2 -- P X (R:T) DESIGN -- R AND T RANDOM

D STUDY DESIGN NUMBER 002-002

OBJECT OF MEASUREMENT : P FACETS : T R:T

G STUDY POPULATION SIZE : INFINITE G STUDY UNIVERSE SIZES : INFINITE INFINITE

D STUDY POPULATION SIZE : INFINITE D STUDY UNIVERSE SIZES : INFINITE INFINITE

D STUDY SAMPLE SIZE : 10 D STUDY SAMPLE SIZES : 3 2

----------------------------------------------------------------------------------------------------------------------------------

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 .47315 1.0000 1 .47315 .38558 .47315 1.0000 1 .47315 .38558

T .32515 1.0000 3 .10838 .14600 .32515 1.0000 3 .10838 .14600

R:T .64753 1.0000 6 .10792 .06323 .64753 1.0000 6 .10792 .06323

PT .55957 1.0000 3 .18652 .12554 .55957 1.0000 3 .18652 .12554

PR:T 2.38025 1.0000 6 .39671 .06158 2.38025 1.0000 6 .39671 .06158

----------------------------------------------------------------------------------------------------------------------------------

QFM = QUADRATIC FORM

----------------------------------------------------------------------------------------------------------------------------------

STANDARD

STANDARD ERROR OF

VARIANCE DEVIATION VARIANCE

UNIVERSE SCORE .47315 .68786 .38558

EXPECTED OBSERVED SCORE 1.05638 1.02780 .36716

LOWER CASE DELTA .58323 .76370 .12554 GENERALIZABILITY COEFFICIENT = .44790 ( .81125)

UPPER CASE DELTA .79954 .89417 .18418 PHI = .37177 ( .59178)

MEAN .32194 .56740

----------------------------------------------------------------------------------------------------------------------------------

NOTE: SIGNAL/NOISE RATIOS ARE IN PARENTHESES

GENOVA VERSION 3.1 PAGE 23

D STUDY #2 -- P X (R:T) DESIGN -- R AND T RANDOM

D STUDY DESIGN NUMBER 002-002

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

P T R:T PT PR:T

P .1486687

T .0014813 .0213148

R:T .0000000 -.0019993 .0039986

PT -.0148130 -.0015761 .0001896 .0157611

PR:T .0000000 .0001896 -.0003792 -.0018961 .0037922

GENOVA VERSION 3.1 PAGE 24

D STUDY #2 -- P X (R:T) DESIGN -- R AND T RANDOM

D STUDY DESIGN NUMBER 002-003

OBJECT OF MEASUREMENT : P FACETS : T R:T

G STUDY POPULATION SIZE : INFINITE G STUDY UNIVERSE SIZES : INFINITE INFINITE

D STUDY POPULATION SIZE : INFINITE D STUDY UNIVERSE SIZES : INFINITE INFINITE

D STUDY SAMPLE SIZE : 10 D STUDY SAMPLE SIZES : 4 2

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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 .47315 1.0000 1 .47315 .38558 .47315 1.0000 1 .47315 .38558

T .32515 1.0000 4 .08129 .10950 .32515 1.0000 4 .08129 .10950

R:T .64753 1.0000 8 .08094 .04743 .64753 1.0000 8 .08094 .04743

PT .55957 1.0000 4 .13989 .09416 .55957 1.0000 4 .13989 .09416

PR:T 2.38025 1.0000 8 .29753 .04619 2.38025 1.0000 8 .29753 .04619

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QFM = QUADRATIC FORM

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STANDARD

STANDARD ERROR OF

VARIANCE DEVIATION VARIANCE

UNIVERSE SCORE .47315 .68786 .38558

EXPECTED OBSERVED SCORE .91057 .95424 .36785

LOWER CASE DELTA .43742 .66138 .09416 GENERALIZABILITY COEFFICIENT = .51962 ( 1.08167)

UPPER CASE DELTA .59965 .77437 .13814 PHI = .44104 ( .78904)

MEAN .25329 .50328

----------------------------------------------------------------------------------------------------------------------------------

NOTE: SIGNAL/NOISE RATIOS ARE IN PARENTHESES

GENOVA VERSION 3.1 PAGE 25

D STUDY #2 -- P X (R:T) DESIGN -- R AND T RANDOM

D STUDY DESIGN NUMBER 002-003

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

P T R:T PT PR:T

P .1486687

T .0011110 .0119896

R:T .0000000 -.0011246 .0022492

PT -.0111097 -.0008866 .0001067 .0088656

PR:T .0000000 .0001067 -.0002133 -.0010666 .0021331

GENOVA VERSION 3.1 PAGE 26

D STUDY #2 -- P X (R:T) DESIGN -- R AND T RANDOM

D STUDY DESIGN NUMBER 002-004

OBJECT OF MEASUREMENT : P FACETS : T R:T

G STUDY POPULATION SIZE : INFINITE G STUDY UNIVERSE SIZES : INFINITE INFINITE

D STUDY POPULATION SIZE : INFINITE D STUDY UNIVERSE SIZES : INFINITE INFINITE

D STUDY SAMPLE SIZE : 10 D STUDY SAMPLE SIZES : 5 2

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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 .47315 1.0000 1 .47315 .38558 .47315 1.0000 1 .47315 .38558

T .32515 1.0000 5 .06503 .08760 .32515 1.0000 5 .06503 .08760

R:T .64753 1.0000 10 .06475 .03794 .64753 1.0000 10 .06475 .03794

PT .55957 1.0000 5 .11191 .07533 .55957 1.0000 5 .11191 .07533

PR:T 2.38025 1.0000 10 .23802 .03695 2.38025 1.0000 10 .23802 .03695

----------------------------------------------------------------------------------------------------------------------------------

QFM = QUADRATIC FORM

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STANDARD

STANDARD ERROR OF

VARIANCE DEVIATION VARIANCE

UNIVERSE SCORE .47315 .68786 .38558

EXPECTED OBSERVED SCORE .82309 .90724 .36955

LOWER CASE DELTA .34994 .59156 .07533 GENERALIZABILITY COEFFICIENT = .57485 ( 1.35209)

UPPER CASE DELTA .47972 .69262 .11051 PHI = .49655 ( .98630)

MEAN .21209 .46054

----------------------------------------------------------------------------------------------------------------------------------

NOTE: SIGNAL/NOISE RATIOS ARE IN PARENTHESES

GENOVA VERSION 3.1 PAGE 27

D STUDY #2 -- P X (R:T) DESIGN -- R AND T RANDOM

D STUDY DESIGN NUMBER 002-004

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

P T R:T PT PR:T

P .1486687

T .0008888 .0076733

R:T .0000000 -.0007197 .0014395

PT -.0088878 -.0005674 .0000683 .0056740

PR:T .0000000 .0000683 -.0001365 -.0006826 .0013652

GENOVA VERSION 3.1 PAGE 28

D STUDY #2 -- P X (R:T) DESIGN -- R AND T RANDOM

D STUDY DESIGN NUMBER 002-005

OBJECT OF MEASUREMENT : P FACETS : T R:T

G STUDY POPULATION SIZE : INFINITE G STUDY UNIVERSE SIZES : INFINITE INFINITE

D STUDY POPULATION SIZE : INFINITE D STUDY UNIVERSE SIZES : INFINITE INFINITE

D STUDY SAMPLE SIZE : 10 D STUDY SAMPLE SIZES : 6 2

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VARIANCE COMPONENTS IN TERMS OF VARIANCE COMPONENTS IN TERMS OF

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

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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 .47315 1.0000 1 .47315 .38558 .47315 1.0000 1 .47315 .38558

T .32515 1.0000 6 .05419 .07300 .32515 1.0000 6 .05419 .07300

R:T .64753 1.0000 12 .05396 .03162 .64753 1.0000 12 .05396 .03162

PT .55957 1.0000 6 .09326 .06277 .55957 1.0000 6 .09326 .06277

PR:T 2.38025 1.0000 12 .19835 .03079 2.38025 1.0000 12 .19835 .03079

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QFM = QUADRATIC FORM

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STANDARD

STANDARD ERROR OF

VARIANCE DEVIATION VARIANCE

UNIVERSE SCORE .47315 .68786 .38558

EXPECTED OBSERVED SCORE .76476 .87451 .37121

LOWER CASE DELTA .29162 .54001 .06277 GENERALIZABILITY COEFFICIENT = .61869 ( 1.62251)

UPPER CASE DELTA .39977 .63227 .09209 PHI = .54203 ( 1.18356)

MEAN .18463 .42969

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NOTE: SIGNAL/NOISE RATIOS ARE IN PARENTHESES

GENOVA VERSION 3.1 PAGE 29

D STUDY #2 -- P X (R:T) DESIGN -- R AND T RANDOM

D STUDY DESIGN NUMBER 002-005

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

P T R:T PT PR:T

P .1486687

T .0007406 .0053287

R:T .0000000 -.0004998 .0009996

PT -.0074065 -.0003940 .0000474 .0039403

PR:T .0000000 .0000474 -.0000948 -.0004740 .0009481

GENOVA VERSION 3.1 PAGE 30

D STUDY #2 -- P X (R:T) DESIGN -- R AND T RANDOM

SUMMARY OF D STUDY RESULTS FOR SET OF CONTROL CARDS NO. 002

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V A R I A N C E S

SAMPLE SIZES --------------------------------------------------------

D STUDY ------------------------------------- EXPECTED LOWER UPPER

DESIGN INDEX= $P T R UNIVERSE OBSERVED CASE CASE GEN.

NO UNIV.= INF. INF. INF. SCORE SCORE DELTA DELTA MEAN COEF. PHI

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002-001 10 2 2 .47315 1.34799 .87485 1.19931 .45926 .35100 .28291

002-002 10 3 2 .47315 1.05638 .58323 .79954 .32194 .44790 .37177

002-003 10 4 2 .47315 .91057 .43742 .59965 .25329 .51962 .44104

002-004 10 5 2 .47315 .82309 .34994 .47972 .21209 .57485 .49655

002-005 10 6 2 .47315 .76476 .29162 .39977 .18463 .61869 .54203

GENOVA VERSION 3.1 PAGE 31

CONTROL CARD INPUT LISTING

COLUMN 11111111112222222222333333333344444444445555555555666666666677777777778

12345678901234567890123456789012345678901234567890123456789012345678901234567890

COMMENT

COMMENT What if raters were nested in tasks nested in persons?

COMMENT This means persons get different tasks (maybe they select them).

DSTUDY #3 -- R:T:P DESIGN -- R AND T RANDOM

DEFFECT $ P

DEFFECT T:P 3

DEFFECT R:T:P 1 2 3 4

ENDDSTUDY

GENOVA VERSION 3.1 PAGE 32

D STUDY #3 -- R:T:P DESIGN -- R AND T RANDOM

D STUDY DESIGN NUMBER 003-001

OBJECT OF MEASUREMENT : P FACETS : T R:T

G STUDY POPULATION SIZE : INFINITE G STUDY UNIVERSE SIZES : INFINITE INFINITE

D STUDY POPULATION SIZE : INFINITE D STUDY UNIVERSE SIZES : INFINITE INFINITE

D STUDY SAMPLE SIZE : 10 D STUDY SAMPLE SIZES : 3 1

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VARIANCE COMPONENTS IN TERMS OF VARIANCE COMPONENTS IN TERMS OF

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

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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 .47315 1.0000 1 .47315 .38558 .47315 1.0000 1 .47315 .38558

T .88472 1.0000 3 .29491 .18418 .88472 1.0000 3 .29491 .18418

R:T 3.02778 1.0000 3 1.00926 .16772 3.02778 1.0000 3 1.00926 .16772

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QFM = QUADRATIC FORM

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STANDARD

STANDARD ERROR OF

VARIANCE DEVIATION VARIANCE

UNIVERSE SCORE .47315 .68786 .38558

EXPECTED OBSERVED SCORE 1.77731 1.33316 .41230

LOWER CASE DELTA 1.30417 1.14200 .21906 GENERALIZABILITY COEFFICIENT = .26622 ( .36280)

UPPER CASE DELTA 1.30417 1.14200 .21906 PHI = .26622 ( .36280)

MEAN .17773 .42158

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NOTE: SIGNAL/NOISE RATIOS ARE IN PARENTHESES

GENOVA VERSION 3.1 PAGE 33

D STUDY #3 -- R:T:P DESIGN -- R AND T RANDOM

D STUDY DESIGN NUMBER 003-001

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

P T R:T

P .1486687

T -.0133317 .0339236

R:T .0000000 -.0070323 .0281294

GENOVA VERSION 3.1 PAGE 34

D STUDY #3 -- R:T:P DESIGN -- R AND T RANDOM

D STUDY DESIGN NUMBER 003-002

OBJECT OF MEASUREMENT : P FACETS : T R:T

G STUDY POPULATION SIZE : INFINITE G STUDY UNIVERSE SIZES : INFINITE INFINITE

D STUDY POPULATION SIZE : INFINITE D STUDY UNIVERSE SIZES : INFINITE INFINITE

D STUDY SAMPLE SIZE : 10 D STUDY SAMPLE SIZES : 3 2

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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 .47315 1.0000 1 .47315 .38558 .47315 1.0000 1 .47315 .38558

T .88472 1.0000 3 .29491 .18418 .88472 1.0000 3 .29491 .18418

R:T 3.02778 1.0000 6 .50463 .08386 3.02778 1.0000 6 .50463 .08386

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QFM = QUADRATIC FORM

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STANDARD

STANDARD ERROR OF

VARIANCE DEVIATION VARIANCE

UNIVERSE SCORE .47315 .68786 .38558

EXPECTED OBSERVED SCORE 1.27269 1.12813 .39488

LOWER CASE DELTA .79954 .89417 .18418 GENERALIZABILITY COEFFICIENT = .37177 ( .59178)

UPPER CASE DELTA .79954 .89417 .18418 PHI = .37177 ( .59178)

MEAN .12727 .35675

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NOTE: SIGNAL/NOISE RATIOS ARE IN PARENTHESES

GENOVA VERSION 3.1 PAGE 35

D STUDY #3 -- R:T:P DESIGN -- R AND T RANDOM

D STUDY DESIGN NUMBER 003-002

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

P T R:T

P .1486687

T -.0133317 .0339236

R:T .0000000 -.0035162 .0070323

GENOVA VERSION 3.1 PAGE 36

D STUDY #3 -- R:T:P DESIGN -- R AND T RANDOM

D STUDY DESIGN NUMBER 003-003

OBJECT OF MEASUREMENT : P FACETS : T R:T

G STUDY POPULATION SIZE : INFINITE G STUDY UNIVERSE SIZES : INFINITE INFINITE

D STUDY POPULATION SIZE : INFINITE D STUDY UNIVERSE SIZES : INFINITE INFINITE

D STUDY SAMPLE SIZE : 10 D STUDY SAMPLE SIZES : 3 3

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VARIANCE COMPONENTS IN TERMS OF VARIANCE COMPONENTS IN TERMS OF

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

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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 .47315 1.0000 1 .47315 .38558 .47315 1.0000 1 .47315 .38558

T .88472 1.0000 3 .29491 .18418 .88472 1.0000 3 .29491 .18418

R:T 3.02778 1.0000 9 .33642 .05591 3.02778 1.0000 9 .33642 .05591

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QFM = QUADRATIC FORM

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STANDARD

STANDARD ERROR OF

VARIANCE DEVIATION VARIANCE

UNIVERSE SCORE .47315 .68786 .38558

EXPECTED OBSERVED SCORE 1.10448 1.05094 .39289

LOWER CASE DELTA .63133 .79456 .17989 GENERALIZABILITY COEFFICIENT = .42839 ( .74945)

UPPER CASE DELTA .63133 .79456 .17989 PHI = .42839 ( .74945)

MEAN .11045 .33234

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NOTE: SIGNAL/NOISE RATIOS ARE IN PARENTHESES

GENOVA VERSION 3.1 PAGE 37

D STUDY #3 -- R:T:P DESIGN -- R AND T RANDOM

D STUDY DESIGN NUMBER 003-003

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

P T R:T

P .1486687

T -.0133317 .0339236

R:T .0000000 -.0023441 .0031255

GENOVA VERSION 3.1 PAGE 38

D STUDY #3 -- R:T:P DESIGN -- R AND T RANDOM

D STUDY DESIGN NUMBER 003-004

OBJECT OF MEASUREMENT : P FACETS : T R:T

G STUDY POPULATION SIZE : INFINITE G STUDY UNIVERSE SIZES : INFINITE INFINITE

D STUDY POPULATION SIZE : INFINITE D STUDY UNIVERSE SIZES : INFINITE INFINITE

D STUDY SAMPLE SIZE : 10 D STUDY SAMPLE SIZES : 3 4

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VARIANCE COMPONENTS IN TERMS OF VARIANCE COMPONENTS IN TERMS OF

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

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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 .47315 1.0000 1 .47315 .38558 .47315 1.0000 1 .47315 .38558

T .88472 1.0000 3 .29491 .18418 .88472 1.0000 3 .29491 .18418

R:T 3.02778 1.0000 12 .25231 .04193 3.02778 1.0000 12 .25231 .04193

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QFM = QUADRATIC FORM

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STANDARD

STANDARD ERROR OF

VARIANCE DEVIATION VARIANCE

UNIVERSE SCORE .47315 .68786 .38558

EXPECTED OBSERVED SCORE 1.02037 1.01013 .39265

LOWER CASE DELTA .54722 .73974 .17935 GENERALIZABILITY COEFFICIENT = .46370 ( .86464)

UPPER CASE DELTA .54722 .73974 .17935 PHI = .46370 ( .86464)

MEAN .10204 .31943

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NOTE: SIGNAL/NOISE RATIOS ARE IN PARENTHESES

GENOVA VERSION 3.1 PAGE 39

D STUDY #3 -- R:T:P DESIGN -- R AND T RANDOM

D STUDY DESIGN NUMBER 003-004

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

P T R:T

P .1486687

T -.0133317 .0339236

R:T .0000000 -.0017581 .0017581

GENOVA VERSION 3.1 PAGE 40

D STUDY #3 -- R:T:P DESIGN -- R AND T RANDOM

SUMMARY OF D STUDY RESULTS FOR SET OF CONTROL CARDS NO. 003

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V A R I A N C E S

SAMPLE SIZES --------------------------------------------------------

D STUDY ------------------------------------- EXPECTED LOWER UPPER

DESIGN INDEX= $P T R UNIVERSE OBSERVED CASE CASE GEN.

NO UNIV.= INF. INF. INF. SCORE SCORE DELTA DELTA MEAN COEF. PHI

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003-001 10 3 1 .47315 1.77731 1.30417 1.30417 .17773 .26622 .26622

003-002 10 3 2 .47315 1.27269 .79954 .79954 .12727 .37177 .37177

003-003 10 3 3 .47315 1.10448 .63133 .63133 .11045 .42839 .42839

003-004 10 3 4 .47315 1.02037 .54722 .54722 .10204 .46370 .46370

GENOVA VERSION 3.1 PAGE 41

CONTROL CARD INPUT LISTING

COLUMN 11111111112222222222333333333344444444445555555555666666666677777777778

12345678901234567890123456789012345678901234567890123456789012345678901234567890

COMMENT

COMMENT What if tasks are fixed - universe of generalization has 3 tasks?

DSTUDY #4 -- P X (R:T) DESIGN -- R RANDOM, T FIXED

DEFFECT $ P

DEFFECT T 3 / 3

DEFFECT R:T 1 2 3 4

ENDDSTUDY

GENOVA VERSION 3.1 PAGE 42

D STUDY #4 -- P X (R:T) DESIGN -- R RANDOM, T FIXED

D STUDY DESIGN NUMBER 004-001

OBJECT OF MEASUREMENT : P FACETS : T R:T

G STUDY POPULATION SIZE : INFINITE G STUDY UNIVERSE SIZES : INFINITE INFINITE

D STUDY POPULATION SIZE : INFINITE D STUDY UNIVERSE SIZES : 3 INFINITE

D STUDY SAMPLE SIZE : 10 D STUDY SAMPLE SIZES : 3 1

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VARIANCE COMPONENTS IN TERMS OF VARIANCE COMPONENTS IN TERMS OF

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

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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

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P .47315 1.0000 1 .47315 .38558 .65967 1.0000 1 .65967 .36716

T .32515 1.0000 3 .10838 .14600 .32515QFM0000E+00 3 ------- -------

R:T .64753 1.0000 3 .21584 .12647 .64753 1.0000 3 .21584 .12647

PT .55957 1.0000 3 .18652 .12554 .55957 .0000E+00 3 ------- -------

PR:T 2.38025 1.0000 3 .79342 .12316 2.38025 1.0000 3 .79342 .12316

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QFM = QUADRATIC FORM

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STANDARD

STANDARD ERROR OF

VARIANCE DEVIATION VARIANCE

UNIVERSE SCORE .65967 .81220 .36716

EXPECTED OBSERVED SCORE 1.45309 1.20544 .37734

LOWER CASE DELTA .79342 .89074 .12316 GENERALIZABILITY COEFFICIENT = .45398 ( .83143)

UPPER CASE DELTA 1.00926 1.00462 .16772 PHI = .39527 ( .65362)

MEAN .36115 .60096

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NOTE: SIGNAL/NOISE RATIOS ARE IN PARENTHESES

GENOVA VERSION 3.1 PAGE 43

D STUDY #4 -- P X (R:T) DESIGN -- R RANDOM, T FIXED

D STUDY DESIGN NUMBER 004-001

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

P R:T PR:T

P .1348038

R:T .0003792 .0159943

PR:T -.0037922 -.0015169 .0151689

GENOVA VERSION 3.1 PAGE 44

D STUDY #4 -- P X (R:T) DESIGN -- R RANDOM, T FIXED

D STUDY DESIGN NUMBER 004-002

OBJECT OF MEASUREMENT : P FACETS : T R:T

G STUDY POPULATION SIZE : INFINITE G STUDY UNIVERSE SIZES : INFINITE INFINITE

D STUDY POPULATION SIZE : INFINITE D STUDY UNIVERSE SIZES : 3 INFINITE

D STUDY SAMPLE SIZE : 10 D STUDY SAMPLE SIZES : 3 2

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VARIANCE COMPONENTS IN TERMS OF VARIANCE COMPONENTS IN TERMS OF

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

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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

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P .47315 1.0000 1 .47315 .38558 .65967 1.0000 1 .65967 .36716

T .32515 1.0000 3 .10838 .14600 .32515QFM0000E+00 3 ------- -------

R:T .64753 1.0000 6 .10792 .06323 .64753 1.0000 6 .10792 .06323

PT .55957 1.0000 3 .18652 .12554 .55957 .0000E+00 3 ------- -------

PR:T 2.38025 1.0000 6 .39671 .06158 2.38025 1.0000 6 .39671 .06158

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QFM = QUADRATIC FORM

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STANDARD

STANDARD ERROR OF

VARIANCE DEVIATION VARIANCE

UNIVERSE SCORE .65967 .81220 .36716

EXPECTED OBSERVED SCORE 1.05638 1.02780 .36716

LOWER CASE DELTA .39671 .62985 .06158 GENERALIZABILITY COEFFICIENT = .62446 ( 1.66286)

UPPER CASE DELTA .50463 .71037 .08386 PHI = .56658 ( 1.30724)

MEAN .21356 .46213

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NOTE: SIGNAL/NOISE RATIOS ARE IN PARENTHESES

GENOVA VERSION 3.1 PAGE 45

D STUDY #4 -- P X (R:T) DESIGN -- R RANDOM, T FIXED

D STUDY DESIGN NUMBER 004-002

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

P R:T PR:T

P .1348038

R:T .0001896 .0039986

PR:T -.0018961 -.0003792 .0037922

GENOVA VERSION 3.1 PAGE 46

D STUDY #4 -- P X (R:T) DESIGN -- R RANDOM, T FIXED

D STUDY DESIGN NUMBER 004-003

OBJECT OF MEASUREMENT : P FACETS : T R:T

G STUDY POPULATION SIZE : INFINITE G STUDY UNIVERSE SIZES : INFINITE INFINITE

D STUDY POPULATION SIZE : INFINITE D STUDY UNIVERSE SIZES : 3 INFINITE

D STUDY SAMPLE SIZE : 10 D STUDY SAMPLE SIZES : 3 3

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VARIANCE COMPONENTS IN TERMS OF VARIANCE COMPONENTS IN TERMS OF

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

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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

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P .47315 1.0000 1 .47315 .38558 .65967 1.0000 1 .65967 .36716

T .32515 1.0000 3 .10838 .14600 .32515QFM0000E+00 3 ------- -------

R:T .64753 1.0000 9 .07195 .04216 .64753 1.0000 9 .07195 .04216

PT .55957 1.0000 3 .18652 .12554 .55957 .0000E+00 3 ------- -------

PR:T 2.38025 1.0000 9 .26447 .04105 2.38025 1.0000 9 .26447 .04105

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QFM = QUADRATIC FORM

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STANDARD

STANDARD ERROR OF

VARIANCE DEVIATION VARIANCE

UNIVERSE SCORE .65967 .81220 .36716

EXPECTED OBSERVED SCORE .92414 .96132 .36601

LOWER CASE DELTA .26447 .51427 .04105 GENERALIZABILITY COEFFICIENT = .71382 ( 2.49429)

UPPER CASE DELTA .33642 .58002 .05591 PHI = .66226 ( 1.96086)

MEAN .16436 .40542

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NOTE: SIGNAL/NOISE RATIOS ARE IN PARENTHESES

GENOVA VERSION 3.1 PAGE 47

D STUDY #4 -- P X (R:T) DESIGN -- R RANDOM, T FIXED

D STUDY DESIGN NUMBER 004-003

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

P R:T PR:T

P .1348038

R:T .0001264 .0017771

PR:T -.0012641 -.0001685 .0016854

GENOVA VERSION 3.1 PAGE 48

D STUDY #4 -- P X (R:T) DESIGN -- R RANDOM, T FIXED

D STUDY DESIGN NUMBER 004-004

OBJECT OF MEASUREMENT : P FACETS : T R:T

G STUDY POPULATION SIZE : INFINITE G STUDY UNIVERSE SIZES : INFINITE INFINITE

D STUDY POPULATION SIZE : INFINITE D STUDY UNIVERSE SIZES : 3 INFINITE

D STUDY SAMPLE SIZE : 10 D STUDY SAMPLE SIZES : 3 4

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VARIANCE COMPONENTS IN TERMS OF VARIANCE COMPONENTS IN TERMS OF

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

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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

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P .47315 1.0000 1 .47315 .38558 .65967 1.0000 1 .65967 .36716

T .32515 1.0000 3 .10838 .14600 .32515QFM0000E+00 3 ------- -------

R:T .64753 1.0000 12 .05396 .03162 .64753 1.0000 12 .05396 .03162

PT .55957 1.0000 3 .18652 .12554 .55957 .0000E+00 3 ------- -------

PR:T 2.38025 1.0000 12 .19835 .03079 2.38025 1.0000 12 .19835 .03079

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QFM = QUADRATIC FORM

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STANDARD

STANDARD ERROR OF

VARIANCE DEVIATION VARIANCE

UNIVERSE SCORE .65967 .81220 .36716

EXPECTED OBSERVED SCORE .85802 .92630 .36586

LOWER CASE DELTA .19835 .44537 .03079 GENERALIZABILITY COEFFICIENT = .76882 ( 3.32573)

UPPER CASE DELTA .25231 .50231 .04193 PHI = .72333 ( 2.61448)

MEAN .13976 .37385

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NOTE: SIGNAL/NOISE RATIOS ARE IN PARENTHESES

GENOVA VERSION 3.1 PAGE 49

D STUDY #4 -- P X (R:T) DESIGN -- R RANDOM, T FIXED

D STUDY DESIGN NUMBER 004-004

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

P R:T PR:T

P .1348038

R:T .0000948 .0009996

PR:T -.0009481 -.0000948 .0009481

GENOVA VERSION 3.1 PAGE 50

D STUDY #4 -- P X (R:T) DESIGN -- R RANDOM, T FIXED

SUMMARY OF D STUDY RESULTS FOR SET OF CONTROL CARDS NO. 004

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V A R I A N C E S

SAMPLE SIZES --------------------------------------------------------

D STUDY ------------------------------------- EXPECTED LOWER UPPER

DESIGN INDEX= $P T R UNIVERSE OBSERVED CASE CASE GEN.

NO UNIV.= INF. 3 INF. SCORE SCORE DELTA DELTA MEAN COEF. PHI

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004-001 10 3 1 .65967 1.45309 .79342 1.00926 .36115 .45398 .39527

004-002 10 3 2 .65967 1.05638 .39671 .50463 .21356 .62446 .56658

004-003 10 3 3 .65967 .92414 .26447 .33642 .16436 .71382 .66226

004-004 10 3 4 .65967 .85802 .19835 .25231 .13976 .76882 .72333

GENOVA VERSION 3.1 PAGE 51

CONTROL CARD INPUT LISTING

COLUMN 11111111112222222222333333333344444444445555555555666666666677777777778

12345678901234567890123456789012345678901234567890123456789012345678901234567890

FINISH