

Book: Measurement in medicine
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CHAPTER 5. RELIABILITY

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ASSIGNMENT 5.1. Calculation and interpretation of ICC.

calculation of mean score and SD's of Mary and Peter, and mean difference and SD difference.

GET FILE chapter 5, assignments, database short.

```
COMPUTE DiffFROMnas = ROMnas.Mary - ROMnas.Peter .  
EXECUTE .  
COMPUTE DiffROMas = ROMas.Mary - ROMas.Peter .  
EXECUTE .
```

FREQUENCIES

```
VARIABLES=ROMnas.Mary ROMnas.Peter ROMas.Mary ROMas.Peter DiffFROMnas  
DiffROMas  
/STATISTICS=STDDEV MEAN  
/ORDER= ANALYSIS .
```

* calculation of ICCs.*

***Method 1: VARCOMPS.

* for this analysis it is needed that the datafile is structured with the scores of Mary and Peter under each other.

GET FILE chapter 5, assignments, database short.

```
VARSTOCASES /ID = id  
/MAKE trans1 FROM ROMas.Mary ROMas.Peter  
/MAKE trans2 FROM ROMnas.Mary ROMnas.Peter  
/INDEX = Index1(2)  
/KEEP = patcode  
/NULL = KEEP.
```

```
SAVE OUTFILE= ...'chapter 5_assignments database long.sav'.  
(this is the same datafile as chapter 5, assignments, database long.)
```

* affected shoulder

VARCOMP

```
trans1 BY patcode Index1
/RANDOM = patcode Index1
/METHOD = REML
/CRITERIA = ITERATE(50)
/CRITERIA = CONVERGE(1.0E-8)
/DESIGN = patcode Index1
/INTERCEPT = INCLUDE .
```

* non-affected shoulder

VARCOMP

```
trans2 BY patcode Index1
/RANDOM = patcode Index1
/METHOD = REML
/CRITERIA = ITERATE(50)
/CRITERIA = CONVERGE(1.0E-8)
/DESIGN = patcode Index1
/INTERCEPT = INCLUDE .
```

*manual calculation of ICCs for the affected side: $236.933 / (236.933 + 0.00 + 49.981) = 0.83$ (ICC agreement).

* $236.933 / (236.933 + 49.981) = 0.83$ (ICC consistency).

*manual calculation of ICCs for the non-affected side: $18.078 / (18.078 + 0.106 + 45.910) = 0.28$ (ICC agreement).

* $18.078 / (18.078 + 45.910) = 0.28$ (ICC consistency).

*** METHOD 2: ICC via Scale > reliability analyses.

GET FILE chapter 5, assignment, database short.

* Affected shoulder.

* ICC consistency.

RELIABILITY

```
/VARIABLES=ROMas.Mary ROMas.Peter
/SCALE('ALL VARIABLES') ALL/MODEL=ALPHA
/STATISTICS=ANOVA
/ICC=MODEL(RANDOM) TYPE(CONSISTENCY) CIN=95 TESTVAL=0 .
```

* ICC agreement.

RELIABILITY

```
/VARIABLES=ROMas.Mary ROMas.Peter
/SCALE('ALL VARIABLES') ALL/MODEL=ALPHA
/STATISTICS=ANOVA
/ICC=MODEL(RANDOM) TYPE(ABSOLUTE) CIN=95 TESTVAL=0 .
```

* Non-affected shoulder.

* ICC consistency.

RELIABILITY

```
/VARIABLES=ROMnas.Mary ROMnas.Peter
/SCALE('ALL VARIABLES') ALL/MODEL=ALPHA
```

```
/STATISTICS=ANOVA
/ICC=MODEL(MIXED) TYPE(CONSISTENCY) CIN=95 TESTVAL=0 .
```

* ICC agreement.

RELIABILITY

```
/VARIABLES=ROMnas.Mary ROMnas.Peter
/SCALE('ALL VARIABLES') ALL/MODEL=ALPHA
/STATISTICS=ANOVA
/ICC=MODEL(MIXED) TYPE(ABSOLUTE) CIN=95 TESTVAL=0 .
```

ASSIGNMENT 5.2. Calculation for drawing Bland and Altman plot.

GET FILE chapter 5, assignments, database short.

T-TEST

```
PAIRS = ROMas.Mary WITH ROMas.Peter (PAIRED)
/CRITERIA = CI(.95)
/MISSING = ANALYSIS.
```

T-TEST

```
PAIRS = ROMnas.Mary WITH ROMnas.Peter (PAIRED)
/CRITERIA = CI(.95)
/MISSING = ANALYSIS.
```

```
COMPUTE meandiffas = (ROMas.Mary + ROMas.Peter)/2 .
```

```
EXECUTE .
```

```
COMPUTE meandiffnas = (ROMnas.Mary + ROMnas.Peter)/2 .
```

```
EXECUTE .
```