

# Re: Quadratic weighted Kappa and the Intraclass Correlation Coefficient

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*Source:* <http://sci.tech-archive.net/Archive/sci.stat.edu/2008-11/msg00011.html>

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After some computational investigations, it appears that weighted kappa, using quadratic (Fleiss-Cohen) weights, asymptotically approaches the ICC(2, 1) as N becomes large.

The ICC(2, 1) is the Case 2 ICC estimating the reliability of a single rater.

The Case 2 ICC assumes that the two raters compared are a random sample from a population of raters, and estimates the reliability of any randomly sampled pair of raters from this population.

To me this is unexpected, because the "chance agreement" term of weighted kappa assumes that the two raters considered are the only ones; thus one might expect that weighted kappa would correspond to the ICC(3, 1), which does not generalize from the two raters to a larger population of raters.

It might be something of an algebraic coincidence that weighted kappa corresponds to the ICC(2, 1). In any case, it is a potentially useful result, since often we wish to estimate, from two given raters, reliability in the overall rater population.

Of course, that is not always true. For example, if one wishes to compare two automated diagnostic procedures, one is usually interested only in agreement between these two procedures, not between any pair of procedures drawn from the population from which these two are a random sample.

Note that in SAS the Fleiss-Cohen weights are *not* the default; you must request them with the "agree (WT=FC)" option, as in the following example:

```
proc freq data = <data> ;  
tables rater1 * rater2 / norow nocol nopercnt agree (WT=FC) ;  
output agree out=stats;
```

```
* include significance tests ;
```

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test kappa wtkap ;  
run;

The good folks at the Ulm Medical School (Germany) have placed a helpful ICC calculator online, found here:

<http://sip.medizin.uni-ulm.de/informatik/projekte/Odds/icc.html>

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