

Instructions for Using the aspec Program

John Uebersax

www.john-uebersax.com

5 August 2014

<<Note>>: this program is **not supported**. The point of my writing these instructions is so that I will not have to answer questions about it. Please do not email me concerning it, unless you have a very, very, very good reason for doing so. And use at your own risk in any case.

If you are unable to run the program, or get an error message, 9 times out of 10 it is because the input file is not formatted correctly, or not placed in the same folder as the program. In that case, consult your local computer guru — not me!

Introduction

aspec is a standalone computer program for computing bootstrap estimates of the standard error and confidence intervals (90% and 95%) for the statistical index known as the *proportion of specific agreement*. For details on this index and its computation, please see the [Raw Agreement Indices](#) page of my Statistical Methods for Rater and Diagnostic Agreement [website](#).

Running the Program

To run the program, first supply the four frequencies of a 2 x 2 agreement/disagreement table (i.e. Table 1 on the Raw Agreement Indices web page). These must be supplied one frequency per line, i.e.:

a
b
c
d

It's safest to add a blank line at the end (because of technical differences amongst text editors).

This file must be named *table.txt*, and it must be in the same folder as the executable program *as3.exe*.

The proportion of specific agreement is defined here as $(2a)/(2a + b + c)$. Therefore, if, for example, you want this to be 'positive agreement' (PA), then *a* must be the number of times both raters supplied a positive rating.

If you're also interested in negative agreement (NA), or $(2d)/(2d + b + c)$, you'll have to re-enter the data in the order *d, c, b, a* (or *d, b, c, a* — it makes no difference) and re-run the program. (That's because I originally wrote the program just to compare bootstrap and asymptotic standard errors and CIs, and didn't intend to share it.)

An example *table.txt* file is supplied with the program.

The fortran 90 source code, *as3.f*, is included. (To view this with a regular text editor, you might need to rename it something like *as3.f.txt*).

Sample output (*output.txt*) is also supplied. (Once you have extracted all these files from *aspec.zip*, I would encourage you to save copies of the files somewhere; the *output.txt* file will be over-written each time you run the program).

To run the program in Windows, simply click on the icon for the file *as3.exe*. (Again, make sure that your *table.txt* file is in the same folder.) A Command Prompt window will then appear, displaying iteration numbers; when this reaches 100,000 (100,000 bootstrap samples), the program will prompt you to "Press any key..." Once you do so, the Command Prompt window will automatically close. When that happens, your results should be in the new *output.txt* file.

For those with more experience using the Command Prompt window, there are other ways of running *as3.exe*. More information about the Command Prompt window can be [found here](#).

Technical Details

This version uses 100,000 bootstrap samples. In hindsight, I think this is on the low side; 1,000,000 would be better; if you know fortran, you can change this pretty easily and recompile the program.

The calculated specific agreement value for each bootstrap sample is written to the file *results.txt*. The results sorted from low to high are written to the file *sorted.txt*. 90% and 95% bootstrap confidence intervals are obtained nonparametrically: that is, for example, the 90% CI is bounded by the 5000th and the 95000th values of *sorted.txt*.

The files *results.txt*, *sorted.txt*, (and *output.txt*) are over-written each time the program runs.

Example

Here's an example of the *table.txt* file:

```
1 0
2 0
3 0
4 0
```

The corresponding output file, *output.txt* is shown below. For the data, the index of specific agreement is 0.2857. 100,000 bootstrap samples are generated. The mean and median index of specific agreement for these samples are:

```
Bootstrap mean      : 0.2829
Bootstrap median    : 0.2821
```

For these data, the asymptotic SE is 0.0707 and the bootstrap SE is 0.0710.

The five rows of numbers that appear before the Simulation Results section are the first five bootstrap samples (and the total frequency). These serve no purpose except to verify that the program ran correctly.

Here is the *output.txt* file for the above data:

*** Observed Table ***

10.000	20.000		30.000
30.000	40.000		70.000
-----+-----			
40.000	60.000		100.000

Marginals

Row	Column
-----	-----
30.0000	40.0000
70.0000	60.0000
crit =	0.2857

13	20	36	31	100	0.3171
8	17	32	43	100	0.2462
12	18	28	42	100	0.3429
11	33	20	36	100	0.2933
14	21	36	29	100	0.3294

*** Simulation Results ***

random generator seed value:	232
Number of simulated tables :	100000
Number >= reference value :	49745
Simulated exact p-value :	0.49745
Criterion value :	0.2857
Bootstrap mean :	0.2829
Bootstrap median :	0.2821
Bootstrap standard error :	0.0710
90% BS confidence limits :	(0.1644 - 0.4000)
95% BS confidence limits :	(0.1429 - 0.4211)
Asymptotic standard error :	0.0707
90% AS confidence limits :	(0.1694 - 0.4020)
95% AS confidence limits :	(0.1471 - 0.4243)