October 13th critique of four DFBA functions: dfba\_mann\_whitney, dfba\_wilcoxon, dfba\_phi, dfba\_gamma. It does not seem that dfba\_gamma\_out\_class, dfba\_plot\_beta, and dfba\_table\_gamma are functions like the other functions in the package. Can you handle those functions or perhaps explain what those items are in a future Zoom meeting?

Section I Critique of dfba\_mann\_whitney:

As far as the coding goes, there is still a problem when I run this function in Console on a Mac, but if we ignore this issue for the other functions, then we can also ignore this issue for this function as well.

The rest of the problems deal with documentation issues, which I will go through below:

1. In Arguments, for a0 replace existing with “The first shape parameter for the prior beta distribution for omega\_E (default is 1)”
2. In Arguments, for b0 replace existing with “The second shape parameter for the prior beta distribution for omega\_E (default is 1)”
3. In Arguments, for prob\_interval, replace existing with “Desired probability value for the interval estimate for omega\_E (default is .95)”
4. In Argument, for samples, replace existing with “The number of Monte Carlo samples for omega\_E when method = “small” (default is 30000)”
5. In the Details section at the end of the paragraph that begins with “The prob\_interval …” Add the sentence “So, for each candidate …”. I would also continue the paragraph with the sentence “The argument ‘samples’ …” These two sentences complete the paragraph which is about the method=”small”. After those concluding sentences, the next paragraph could begin with “For large sample sizes …”
6. In the Value section, for omega\_E replace the existing with “ A vector of values representing candidate value for omega\_E when method=”small”
7. In the Value section, for omegapost replace the existing with “ A vector of values representing the discrete probabilities for the candidate values for omega\_E” I would not mention the plot operation here. Perhaps we can add a sentence about plotting in the Details section.
8. In the Value section, for priorvector replace the existing with “A vector of values representing the prior discrete probabilities of candidates for omega\_E when method = “small”
9. In the Value section, for qLv replace the existing with “Lower limit of the equal-tail probability interval for omega\_E with probability width indicated by ‘prob\_interval’
10. In the Value section, the qHv replace the existing width “Upper limit of the equal-tail probability interval for omega\_E with probability width indicated by ‘prob\_interval’
11. In the Reference section. For the first reference the full title is “Bayesian Statistics for Experimental Scientists: A General Introduction Using Distribution-Free Methods”
12. In the Reference section, the doi has a typo.The correct doi’s last seven digits are .1549247 rather than .2549247

Section II Critique of dfba\_wilcoxon

Same comments that I made about the dfba\_mann\_whitney in regard to running the function in R console applies here – (i.e., there is a stray ending fragment in the output that reads “tistics” and the output is in blue font on my Mac.

As far as the coding itself there are some changes needed to make the statistics be T\_pos and T\_neg rather than T\_plus and T\_negative.

1. The cat commands that you employ in the output need to be edited so that is “n T\_pos and T\_neg” rather than “n T\_pos and T\_neg”. This output is in the initial descriptive statitistics.
2. Perhaps the safest way to modify the code in the program itself is to leave the T\_plus and T\_negative in the program but to change in two places the output list. The first place is for the instruction dfba\_wilcoxon\_small\_list<-list(T\_pos=T\_plus,T\_neg=T\_negative,… The other place is for

the instruction dfba\_wilcoxon\_large\_list<-list(T\_pos=T\_plus, T\_neg=T\_negative …

The remaining edits have to do with the documentation. These changes are:

1. In the Description, change T\_plus to T\_pos and change T\_negative to T\_neg
2. In the Arguments section, replace existing for a0 to be “The first shape parameter for the prior beta distribution for phi\_w”
3. In the Arguments section, replace existing for b0 to be “The second shape parameter for the prior beta distribution for phi\_w”
4. In the Arguments section, for ‘samples’ add underscore w after phi in two places
5. In the Argument section, for ‘method’ replace the word omega\_E with phi\_w
6. In the Details section, there is a paragraph were T\_plus is mentioned twice and T\_negative is mentioned twice, these should be changed to T\_pos and T\_neg respectively
7. In the Details section, there is a paragraph that begin “There are two cases for…” In that paragraph add a space between the word “to” and the word “approximate” in the fourth sentence in that paragraph
8. In the Value section, change T\_plus to T\_pos and change T\_negative to T\_neg
9. In the reference section, after the word Scientists for my book, add to the title “A General Introduction to Distribution-Free Methods”
10. There is a missing part of the doi for my Wilcoxon paper. The full reference is

<https://doi.org/10.1080/03610926.2017.1388402>

1. For the example after plot(CW) it might be nice to add another line that is

plot(CW,plot.prior=FALSE) in order for the user to see this option implicitly.

Section III Critique of dfba\_phi

**Let me begin by saying that the existing documentation should be discarded and replaced with the new unformatted documentation file that is attached**.

In terms of the coding, there are a number of changes that I would recommend:

1. In the output, I would label within the Frequentist Analysis the point estimate as Kendall’s Tau\_A Correlation. Also remove the 95% confidence interval and the statement CI to be added.
2. In the Bayesian Analysis section of the output, I would replace the labels of Alpha and Beta with a.post and b.post. I would also label above the a.post and b.post label with Posterior Beta Shape Parameters for the Phi Concordance Measure.
3. For the goodness-of-fit output (i.e., when fitting.parameters has a value) the lower eti value is the same as the upper; there is error in the code for the lower limit.
4. I notice that default option for the plot(A) where A is an R object from running the dfba\_phi function is plot.prior=FALSE. Do we want to make it TRUE instead? Also, the plots do not labels for the posterior and prior like for the other functions we plotted.
5. Note in the documentation in the Values section, I changed the name of some of the variables. There will have to be a change in the code for output to be consistent with the documentation.

Finally, dfba\_phi on my Mac with R console runs fine and the output does not have blue (command mode) font. One thing that is different with dfba\_phi is it does not have sampling and it does not have a counter. Also, the dfba\_beta\_contrast function has sampling but no counter, and it runs fine on my Mac in R console. Perhaps our problem with Mac R console might be linked to the use of the counter. This is just a hypothesis, but it is an interesting fact.

Section IV Critique of dfba\_gamma

**As above, let me begin by saying that the existing documentation should be discarded and replaced with the new unformatted documentation file that is attached**.

Some changes to the programming:

1. The output for the Bayesian analysis, please change the label header to “Posterior Beta Shape Parameters for the Concordance Phi”. Also, the labels for the shape parameter should be a.post and b.post rather than alpha and beta.
2. The output list needs modification to deal with the change in #1. Namely use a.post rather than alpha, and use b.post rather than beta.
3. If A is an R object created by the command A<-dfba\_gamma(x), then plot(A) has the default for plot.prior=FALSE. Do we want to change the default to TRUE? Also, the plot does not have labels for prior and posterior.

That complete the review of the existing DFBA functions with the exception of dfba\_gamma\_out\_class, dfba\_plot\_beta, and dfba\_table\_gamma which seem to either be different from all the other functions. I will return to the last few functions that are not yet part of official github DFBA function. I look forward to seeing your response to the above.