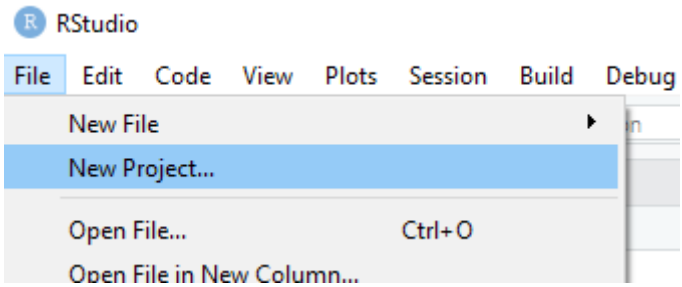
Program **COMPANOVA2** is a program for the analysis of paired comparisons (Gies Bouwman/Toni Rietveld, Radboud University Nijmegen), on the basis of: Scheffé, H. (1952). An analysis of variance for paired comparisons. *Journal of the American Statistical Association* 47, 381-400.

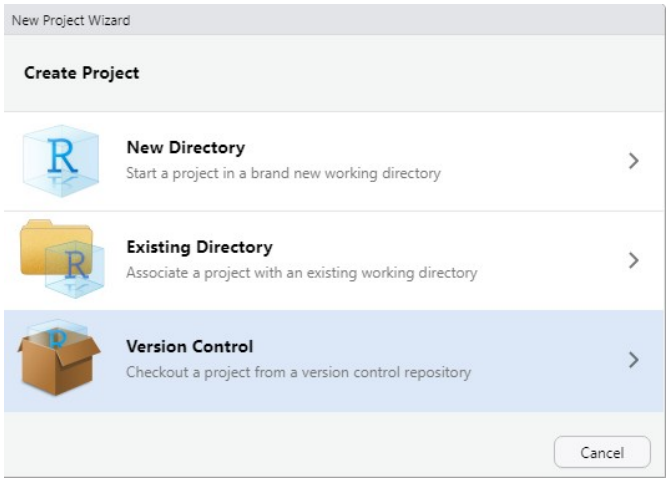
A) Procedure:

1. In case you haven't already done so, install **git**.from http://git-scm.com/downloads

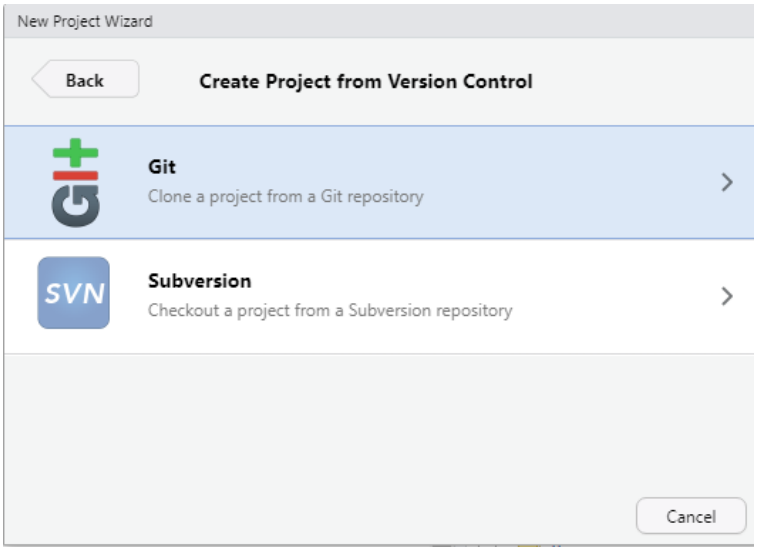
2. After starting **RStudio**, pick New Project… from the **File** menu.



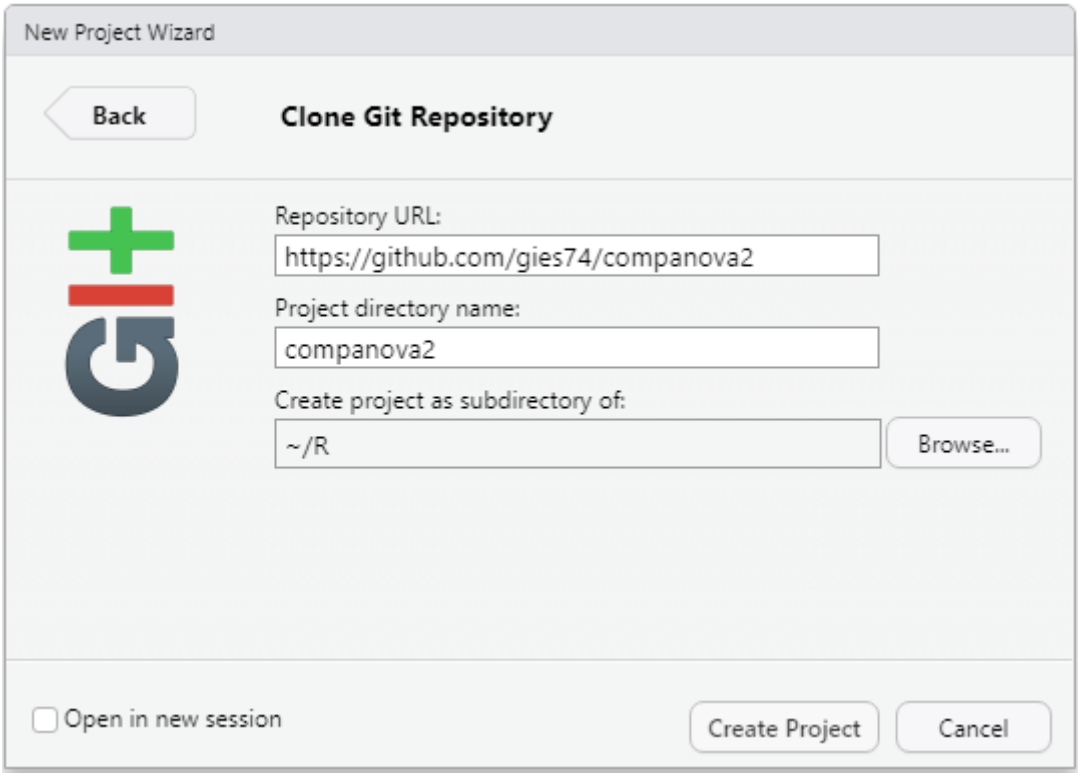
3. In the first screen of the wizard, choose **Version Control**

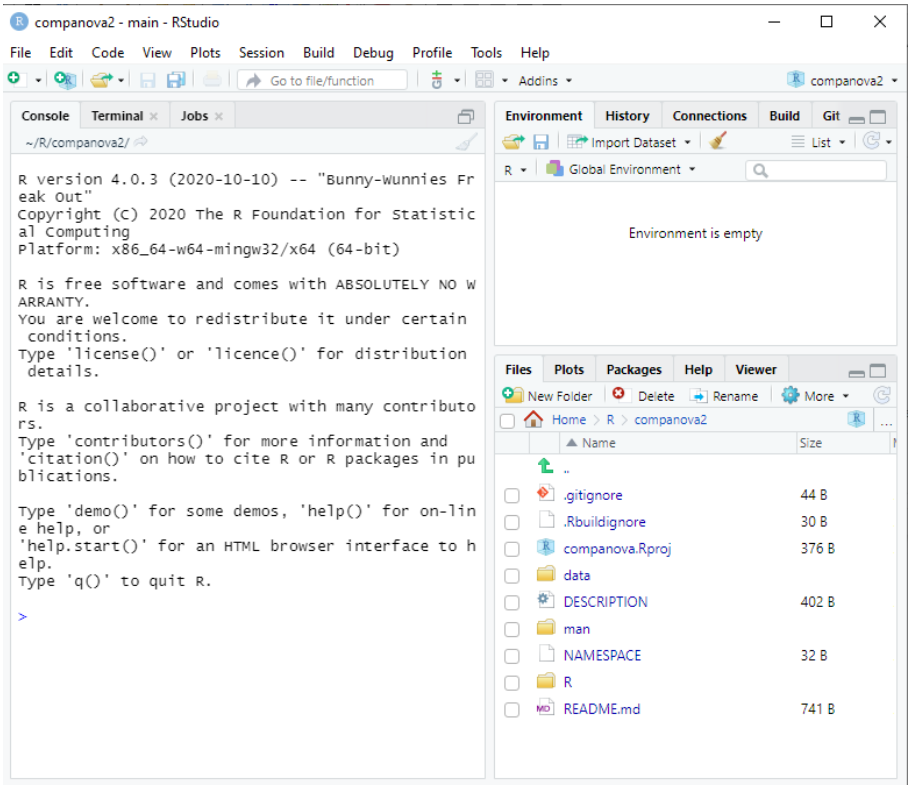


4. On the next screen, click on **Git**

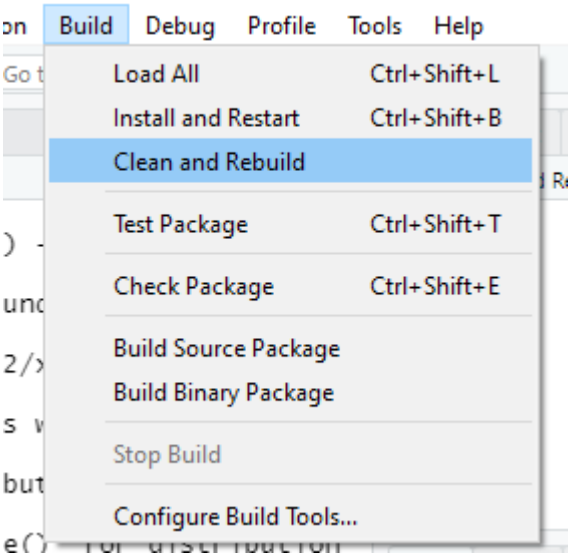


5. On the final screen, enter the URL of the **companova2** git repository.
   A project directory name is automatically suggested, just like the default directory on the file system of your computer. Click **Create Project** to clone the repository locally and open the project.





6. Next, build the package: choose Clean and Rebuild from the Build menu.



The Console panel should display a text that the R session has been restarted and the *companova2* library is loaded as a library.

7. As a final step, run the analysis using the included sample data file scheffeSTANDAARD.dat

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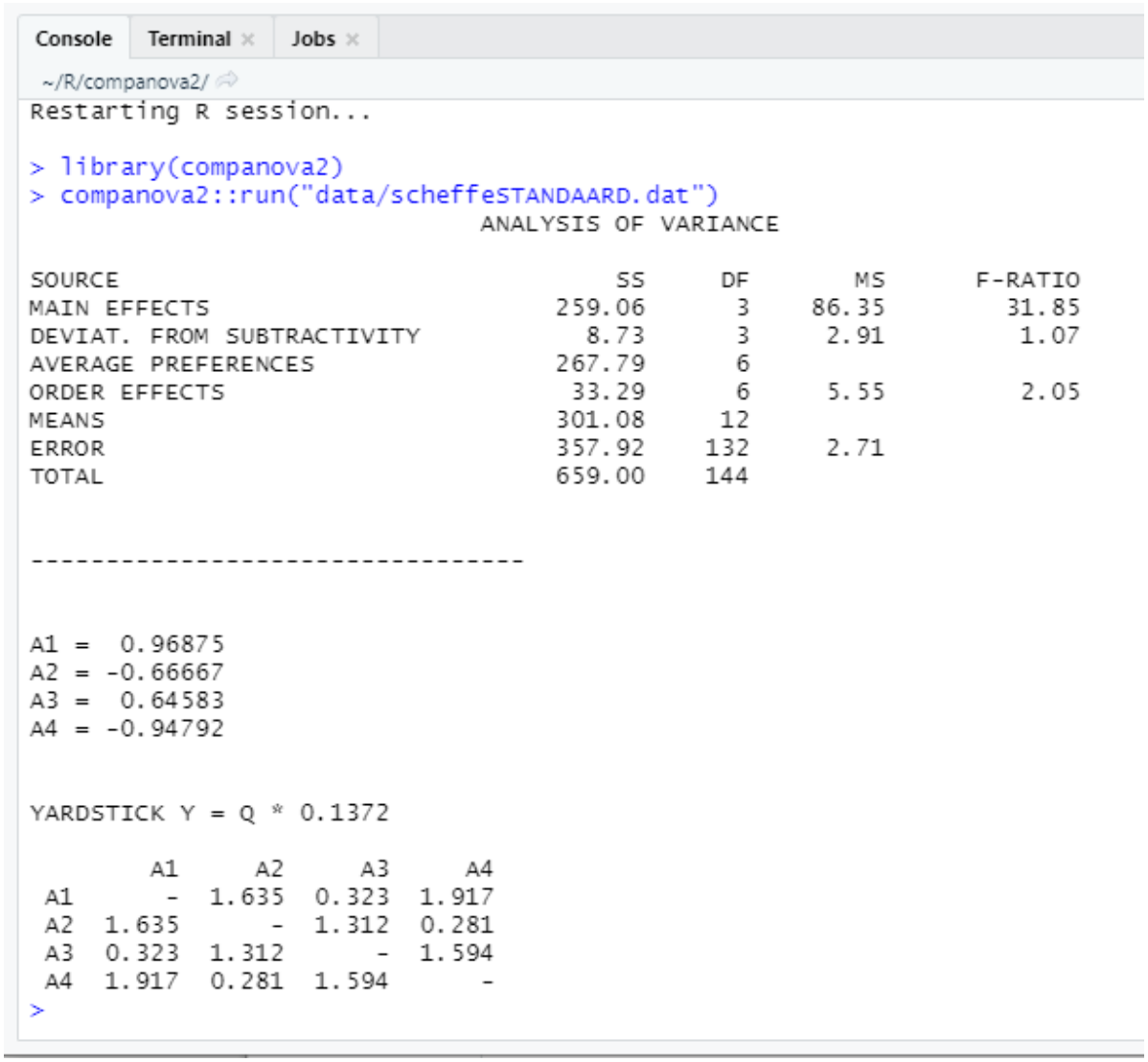
companova2::run("data/scheffeSTANDAARD.dat")
```



The output should look like the screenshot above.

Scale values: The scale values (A1…) represent preferences, going from left (highest preference) to the right (lowest preference). For more details, see Scheffé (1952), and Rietveld (2021).

B) Format input file (example)

For the assessment of 4 Items (A, B, C and D) two groups of raters have to be arranged:
One group assesses the pairs AB, AC, AD, BC, BD etc;
The other group assesses the pairs BA, CA, DA, CB, DB etc.

For the assessments the following scale is used:

Item A better	-3	-2	-1	0	1	2	3	Item B better

If Item A is strongly preferred to Item B, -3 should be scored. If Item B is moderately preferred to Item A, a 2 should be scored, if Item A is slightly preferred to B, -1 should be scored etc. When there is no preference, category 0 should be used.

The results are stored in a data matrix with the extension .DAT, and the following format:

- The data are separated by a blank.
- The 1st column indicates the number *i* of the item of a pair (*i,j*), in which *i* is the first member of a pair that was assessed. The next 7 columns represent the frequencies of the judges who assessed the first item (A) as better etc (-3, -2, -1) than B, and assessed the Item B as better etc. than item A
- Thus, with four items there will be 12 rows, $m \times (m-1)$, with in the first column:

1
2
1
3
1
4
2
3
2
4
3
4

These numbers stand for (1,2), (2,1), (1,3), (3,1)…….. (3,4), (4,3)

As an example we present here the first two rows of a matrix with 12 judges per order:

1 0 0 0 3 3 2 4
2 6 3 1 0 1 1 0

Item B is clearly preferred over Item A in both presentation orders: AB (1,2) and BA (2,1).

C) References

Beijer, L.J., Rietveld, A.C.M., Ruiter, M.B. & Geurts, A.C.H. (2014). Preparing an E-learning-based Speech Therapy (EST) efficacy study: Identifying suitable outcome measures to detect within-subject changes of speech intelligibility in dysarthric speakers. *Clinical Linguistics & Phonetics,* 28 (12), 927-950.

Rietveld, Toni (2021). *Human Measurement Techniques for Speech and Language Pathology*: London: Routledge

Ozaki, K. (2008). Twin Analysis on Paired Comparison Data. *Behavioral Genetics*, 38, 212-222.

Scheffé, H. (1952). An analysis of variance for paired comparisons. *Journal of the American Statistical Association* 47, 381-400.