iRepro package - installation and usage guidelines

In this document we describe how to install the R package iRepro (files iRepro_1.0.tar.gz and iRepro_1.0.zip). If you are able to install the package, but the package does not load, the issues should be resolved by updating to the latest version of R (or at least to R version 3.0.0 or higher). Any updates to the package will be posted to the R online package repository, http://cran.r-project.org/.

1 Installing the iRepro package on Windows

1.1 Installation from iRepro_1.0.tar.gz file

To install the package from iRepro_1.0.tar.gz file, you will need the Rtools (available from http://cran.r-project.org/bin/windows/Rtools/).

Download the file iRepro_1.0.tar.gz. In R, change working directory to the directory where iRepro_1.0.tar.gz is saved (by using command setwd in R Console or by clicking *File* → *Change dir*). To install the package, type

```
install.packages("iRepro_1.0.tar.gz", repos=NULL, type="source")
```

in R console.

Note: If installation did not complete correctly, the issues should be resolved by updating to the latest version of R. Otherwise, installation from iRepro_1.0.zip file should work correctly.

1.2 Installation from iRepro_1.0.zip file

Download the file iRepro_1.0.zip. In R, click *Packages* → *Install package(s) from local zip files* and select the downloaded file.

2 Installing the iRepro package on OS X

The procedure is the same as in 1.1 (except that the Rtools is not needed).

3 Using the iRepro package to estimate ICC from grouped data

The iRepro package calculates ICC from any kind of interval-censored data, not necessarily grouped. In this section we work through one example of grouped data.

For each predefined category in questionnaire, we first need to specify category label and cut-off points, e.g., for the question "How many cigarettes/day do you smoke" (from the Fagerström Test for Nicotine Dependence[1]):

Category	Label	Lower cut-off point	Upper cut-off point
10 or less	0	0	10.5
11 - 20	1	10.5	20.5
21 - 30	2	20.5	30.5
31 and more	3	30.5	40

In iRepro's main function intervalICC, category labels correspond to the argument classes, while cut-off points correspond to c.limits. In R, we would type:

```
classes <- 0:3
c.limits <- matrix(c(0,10.5,10.5,20.5,20.5,30.5,30.5,40), byrow=TRUE, nrow=4)
```

Now we specify questionnaire data. If we have `N = 10` respondents, we need to specify two vectors of length `N` consisting of category labels, e.g.,

```
q1 <- c(0,0,3,2,1,0,1,2,1,0)
q2 <- c(0,1,2,3,1,0,0,2,1,0)
```

In our example, this would mean that the first respondent answered that he smoked 10 or less cigarettes in both questionnaires. The second respondent selected the category "10 or less" in the first questionnaire and the category "11-20" in the second one, and so on. Finally, calling

```
intervalICC(r1=q1, r2=q2, predefined.classes=TRUE, classes=classes, c.limits=c.limits)
```

gives us ICC of 0.87. In the case that the data require transforming (such as adding a constant and applying natural logarithm, which would be appropriate in this example), the transformation needs to be applied only to `c.limits`.

For more information on the package or its functions, please consult the `iRepro` user manual.

References

1. Heatherton TF, Kozlowski LT, Frecker RC, Fagerström KO. The Fagerström test for nicotine dependence: a revision of the Fagerström Tolerance Questionnaire. *Br J Addict.* 1991;86:111927.