Block Randomization using R

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Abstract

Block randomization is implemented in the *psych* package or may be done by sourcing the `block.random` function from the personality-project repository.

The assignment of subjects to experimental conditions may be done using various random processes. Flipping a coin, using a table of random numbers, using the `sample` or `runif` functions in R are easy ways to generate random sequences. But to guarantee equal numbers of subjects in all conditions and to avoid end of experiment effects, it is convenient to *block randomize* subjects to conditions.

Get the psych package or get block.random

This may be done by using the `block.random` function which is available in the *psych* package as of release 1.0.88. (The current release is 1.1.11) so if you have installed *psych* in the last year, you should have it. To install the most recent package, when in R use the `install.packages` option from the menu.)

Alternatively, if you you do not have the most recent release of *psych*, or you just want this one function, you can use the `source` command to get `block.random`.

```
url <- "http://personality-project.org/r/src/contrib/psych/R/block.random.R"
source(url)   #this will load the function
```

Remember, if you want to use the *psych* package you must first make it active.

```
library(psych)
```

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Using block.random

Using `block.random` in an experiment where you want to block randomize 2 factors, sex and drug and you want to run 48 subjects:

```
library(psych)    #make it active
my.cond <- block.random(n=48,c(sex=2,drug=2))
headtail(my.cond) #to show just the first and last 4 cases
#my.cond) (without the  comment will show all the cases.
```

```
> headtail(my.cond)
     blocks sex drug
S1        1   1    2
S2        1   1    1
S3        1   2    1
S4        1   2    2
...     ...  ...  ...
S45      12   2    1
S46      12   1    2
S47      12   1    1
S48      12   2    2
```

Now, consider an experiment with 96 subjects and two drug conditions, three time conditions, and two levels of impuslvity

```
my.cond <- block.random(n=96,c(drug=2,time=3,imp=2))
headtail(my.cond) #to show just the first and last 4 cases
#my.cond) (without the  comment will show all the cases.
```

```
     blocks drug time imp
S1        1    2    3   2
S2        1    1    1   1
S3        1    1    2   1
S4        1    1    2   2
...     ...  ...  ...  ...
S93       8    2    1   2
S94       8    1    1   1
S95       8    2    2   2
S96       8    2    3   2
```

Visualizing block randomization

Although not necessary to do in order to use the block randomized conditions, it is useful to visualize what has happened by using the `pairs.panels` function (Figure 1).

pairs.*panels*(*my.cond*)

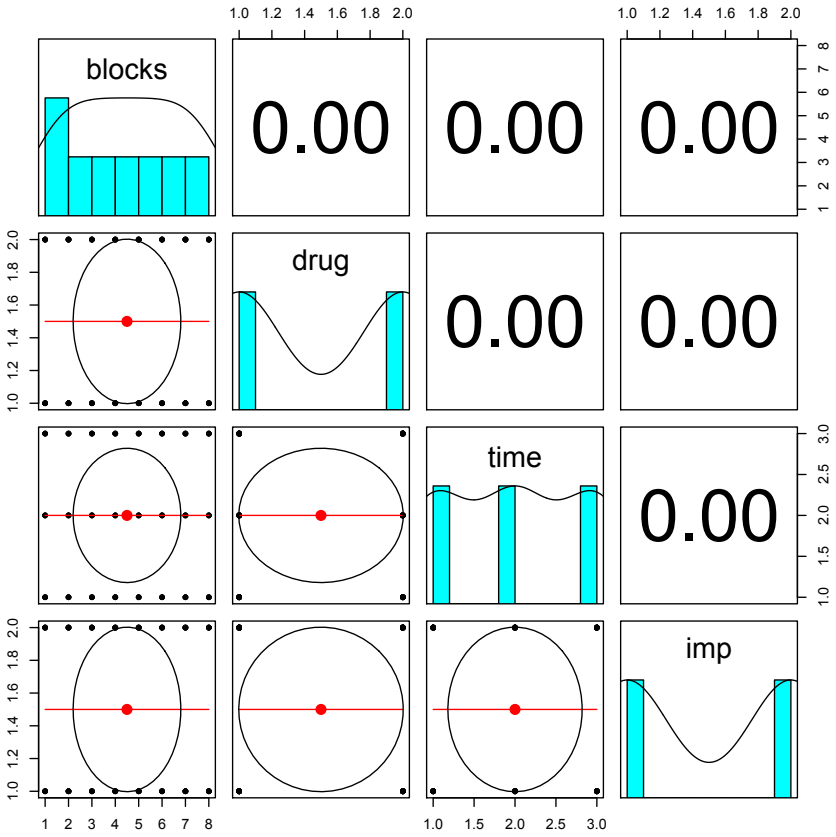

Figure 1. Block randomization of three independent variables (drug, time, and impulsivity) will produce uncorrelated conditions.