Block Randomization using R

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Abstract

Block randomization is implemented in the *psych* package. It allows for block randomization of Subjects by blocks with randomization of the IV within blocks.

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.

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

R code

```
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:

R code

```
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

R code

```
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 **??**).

R code

```
pairs.panels(my.cond)
```

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