WCST data analysis - Step 2

# Manipulate data

## Read data frames and manually rated data

We have loaded the previously saved data frames and merged the manually categorized free text answers about the rule with participantdata\_inc.

## Exclude participants

We excluded extra participants if there were more than 78 in a condition.

## Modify data

Diffifulty of taks was supposed to be a number 1-10, but it was also a free text answer, and some participants went outside the recommended range (e.g.: difficulty = 50). We capped these numbers to 10.

# Statistical data analysis

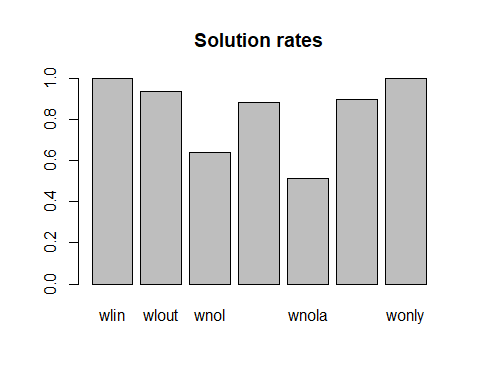
## Descriptive statistics

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Condition | Number of participants | Aha rate of solvers | Failure rate | Avg task time | Avg number of moves |
| wlin | 78 | 0.821 | 0.000 | 1.605 | 31.962 |
| wlout | 78 | 0.932 | 0.064 | 4.286 | 68.756 |
| wnol | 78 | 0.980 | 0.359 | 8.985 | 166.500 |
| wnolfs | 78 | 0.884 | 0.115 | 6.606 | 124.962 |
| wnola | 78 | 0.900 | 0.487 | 10.360 | 236.103 |
| moonsq | 78 | 0.757 | 0.103 | 4.672 | 94.923 |
| wonly | 78 | 0.577 | 0.000 | 0.846 | 19.295 |

## Difficulty of the task

### Solution rate: Fisher’s exact tests

We analyzed the contingency table containing the number of solvers and non-solvers in pairs of conditions. A p<0.05 means that the row/column association is statistically significant.



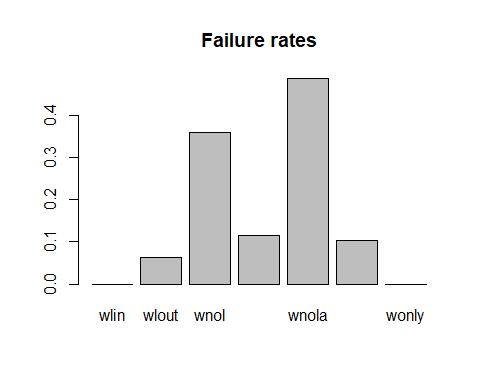
##   
## Fisher's Exact Test for Count Data  
##   
## data: partic\_groups2[c("wlin", "wlout"), c("Nbof\_solvers", "Nbof\_nonsolvers")]  
## p-value = 0.05851  
## alternative hypothesis: true odds ratio is not equal to 1  
## 95 percent confidence interval:  
## 0.9399603 Inf  
## sample estimates:  
## odds ratio   
## Inf

##   
## Fisher's Exact Test for Count Data  
##   
## data: partic\_groups2[c("wlout", "wnol"), c("Nbof\_solvers", "Nbof\_nonsolvers")]  
## p-value = 8.206e-06  
## alternative hypothesis: true odds ratio is not equal to 1  
## 95 percent confidence interval:  
## 2.819385 28.622080  
## sample estimates:  
## odds ratio   
## 8.07041

##   
## Fisher's Exact Test for Count Data  
##   
## data: partic\_groups2[c("wnolfs", "wnola"), c("Nbof\_solvers", "Nbof\_nonsolvers")]  
## p-value = 5.552e-07  
## alternative hypothesis: true odds ratio is not equal to 1  
## 95 percent confidence interval:  
## 3.029108 18.713246  
## sample estimates:  
## odds ratio   
## 7.185509

##   
## Fisher's Exact Test for Count Data  
##   
## data: partic\_groups2[c("moonsq", "wnola"), c("Nbof\_solvers", "Nbof\_nonsolvers")]  
## p-value = 1.641e-07  
## alternative hypothesis: true odds ratio is not equal to 1  
## 95 percent confidence interval:  
## 3.352528 22.396910  
## sample estimates:  
## odds ratio   
## 8.192766

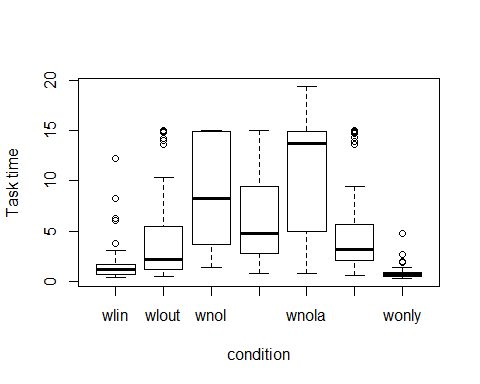
### Failure rate



### Solution time: ANOVA

We checked whether the data was normally distributed with Kolmogorov-Smirnoff test:

If the data is normally distributed, we use ANOVA, if it is not, we use Wilcoxon.



### Binary logistic regression

## Aha feelings: Fisher’s exact test

