Simple Analysis

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## R Markdown

Here is all the analysis for the implicit time course experiment as of May 10th, 2022

source('R/analysis.R')  
continuous\_reaches<- Cleandata("ana/condition 1 trialtype 1\_cuttoff0.7.csv")  
continuous\_reaches<- continuous\_reaches[,-c(4)]  
terminal\_reaches<- Cleandata("ana/condition 3 trialtype 1\_cuttoff0.7.csv")  
terminal\_reaches<- terminal\_reaches[,-c(1)]  
cursorJump\_reaches<- Cleandata("ana/condition 4 trialtype 1\_cuttoff0.7.csv")  
cursorJump\_reaches<- cursorJump\_reaches[,-c(6,8,12,13)]  
  
continuous\_nocursors<- Cleandata("ana/condition 1 trialtype 0\_cuttoff0.7.csv")  
continuous\_nocursors<- continuous\_nocursors[,-c(4)]  
terminal\_nocursors<- Cleandata("ana/condition 3 trialtype 0\_cuttoff0.7.csv")  
terminal\_reaches<- terminal\_reaches[,-c(1)]  
cursorJump\_nocursors<- Cleandata("ana/condition 4 trialtype 0\_cuttoff0.7.csv")  
cursorJump\_nocursors<- cursorJump\_nocursors[,-c(6,8,12,13)]  
  
anovadata<- PrepdataforANOVA()  
  
TtestData<- PrepdataforT()  
library("ez")  
rmodel<- ANOVAanalysis(anovadata[anovadata$Task == "Reaches",])

## Warning: The column supplied as the wid variable contains non-unique values  
## across levels of the supplied between-Ss variables. Automatically fixing this by  
## generating unique wid labels.

## Warning: Data is unbalanced (unequal N per group). Make sure you specified a  
## well-considered value for the type argument to ezANOVA().

rmodel

## $ANOVA  
## Effect DFn DFd F p p<.05 ges  
## 2 Experiment 2 37 6.434886 3.997057e-03 \* 0.05669754  
## 3 Time 3 111 90.244681 1.208294e-29 \* 0.66860840  
## 4 Experiment:Time 6 111 1.383043 2.276583e-01 0.05823914  
##   
## $`Mauchly's Test for Sphericity`  
## Effect W p p<.05  
## 3 Time 0.1540697 4.946051e-13 \*  
## 4 Experiment:Time 0.1540697 4.946051e-13 \*  
##   
## $`Sphericity Corrections`  
## Effect GGe p[GG] p[GG]<.05 HFe p[HF]  
## 3 Time 0.4793557 1.833080e-15 \* 0.4934729 7.540446e-16  
## 4 Experiment:Time 0.4793557 2.585244e-01 0.4934729 2.578326e-01  
## p[HF]<.05  
## 3 \*  
## 4   
##   
## $aov  
##   
## Call:  
## aov(formula = formula(aov\_formula), data = data)  
##   
## Grand Mean: -4.245224  
##   
## Stratum 1: ID  
##   
## Terms:  
## Experiment Residuals  
## Sum of Squares 1861.499 5351.723  
## Deg. of Freedom 2 37  
##   
## Residual standard error: 12.02669  
## 6 out of 8 effects not estimable  
## Estimated effects may be unbalanced  
##   
## Stratum 2: ID:Time  
##   
## Terms:  
## Time Experiment:Time Residuals  
## Sum of Squares 61871.92 1915.24 25618.87  
## Deg. of Freedom 3 6 111  
##   
## Residual standard error: 15.19212  
## Estimated effects may be unbalanced

ncmodel<- ANOVAanalysis(anovadata[anovadata$Task == "No-Cursors",])

## Warning: The column supplied as the wid variable contains non-unique values  
## across levels of the supplied between-Ss variables. Automatically fixing this by  
## generating unique wid labels.  
  
## Warning: Data is unbalanced (unequal N per group). Make sure you specified a  
## well-considered value for the type argument to ezANOVA().

ncmodel

## $ANOVA  
## Effect DFn DFd F p p<.05 ges  
## 2 Experiment 2 39 25.225948 9.327463e-08 \* 0.27481223  
## 3 Time 3 117 52.444319 1.480377e-21 \* 0.48739175  
## 4 Experiment:Time 6 117 2.559789 2.295152e-02 \* 0.08493385  
##   
## $`Mauchly's Test for Sphericity`  
## Effect W p p<.05  
## 3 Time 0.1028237 5.465934e-17 \*  
## 4 Experiment:Time 0.1028237 5.465934e-17 \*  
##   
## $`Sphericity Corrections`  
## Effect GGe p[GG] p[GG]<.05 HFe p[HF]  
## 3 Time 0.4489766 5.774101e-11 \* 0.4592559 3.655182e-11  
## 4 Experiment:Time 0.4489766 7.078024e-02 0.4592559 6.926889e-02  
## p[HF]<.05  
## 3 \*  
## 4   
##   
## $aov  
##   
## Call:  
## aov(formula = formula(aov\_formula), data = data)  
##   
## Grand Mean: -5.376516  
##   
## Stratum 1: ID  
##   
## Terms:  
## Experiment Residuals  
## Sum of Squares 3444.602 2662.724  
## Deg. of Freedom 2 39  
##   
## Residual standard error: 8.262868  
## 6 out of 8 effects not estimable  
## Estimated effects may be unbalanced  
##   
## Stratum 2: ID:Time  
##   
## Terms:  
## Time Experiment:Time Residuals  
## Sum of Squares 8787.258 843.688 6427.059  
## Deg. of Freedom 3 6 117  
##   
## Residual standard error: 7.411621  
## Estimated effects may be unbalanced

IndependentT(TtestData, "Continuous", "Terminal", "Reaches")

## Warning: package 'effsize' was built under R version 4.0.5

## [1] "this is the between subjects comparison of condition Continuous to Terminal Reaches Data"  
## [1] "Aligned"  
##   
## Welch Two Sample t-test  
##   
## data: data$Aligned[data$Experiment == cond1 & data$Task == type] and data$Aligned[data$Experiment == cond2 & data$Task == type]  
## t = -1.7479, df = 21.073, p-value = 0.09503  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -5.5285018 0.4784995  
## sample estimates:  
## mean of x mean of y   
## 1.036038 3.561039   
##   
##   
## Cohen's d  
##   
## d estimate: -0.6826365 (medium)  
## 95 percent confidence interval:  
## lower upper   
## -1.4986431 0.1333701   
##   
## [1] 0.1116208  
## [1] "Beginning of 1st rotation"  
##   
## Welch Two Sample t-test  
##   
## data: data$R1\_Early[data$Experiment == cond1 & data$Task == type] and data$R1\_Early[data$Experiment == cond2 & data$Task == type]  
## t = -1.354, df = 24.867, p-value = 0.1879  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -14.295820 2.956763  
## sample estimates:  
## mean of x mean of y   
## -8.262138 -2.592610   
##   
##   
## Cohen's d  
##   
## d estimate: -0.5214255 (medium)  
## 95 percent confidence interval:  
## lower upper   
## -1.3280354 0.2851845   
##   
## [1] 0.0683011  
## [1] "End of 1st rotation"  
##   
## Welch Two Sample t-test  
##   
## data: data$R1\_Late[data$Experiment == cond1 & data$Task == type] and data$R1\_Late[data$Experiment == cond2 & data$Task == type]  
## t = 0.22576, df = 16.296, p-value = 0.8242  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -11.66025 14.44440  
## sample estimates:  
## mean of x mean of y   
## -29.78841 -31.18049   
##   
##   
## Cohen's d  
##   
## d estimate: 0.08923275 (negligible)  
## 95 percent confidence interval:  
## lower upper   
## -0.7044224 0.8828879   
##   
## [1] 0.002142322  
## [1] "Beginning of 2nd rotation"  
##   
## Welch Two Sample t-test  
##   
## data: data$R2[data$Experiment == cond1 & data$Task == type] and data$R2[data$Experiment == cond2 & data$Task == type]  
## t = -2.109, df = 24.379, p-value = 0.0454  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -32.8257363 -0.3680764  
## sample estimates:  
## mean of x mean of y   
## 13.77325 30.37016   
##   
##   
## Cohen's d  
##   
## d estimate: -0.8148962 (large)  
## 95 percent confidence interval:  
## lower upper   
## -1.64038064 0.01058831   
##   
## [1] 0.1518589  
## [1] "Beginning of Error Clamp"  
##   
## Welch Two Sample t-test  
##   
## data: data$EC[data$Experiment == cond1 & data$Task == type] and data$EC[data$Experiment == cond2 & data$Task == type]  
## t = -4.2682, df = 21.663, p-value = 0.0003226  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -14.892507 -5.146816  
## sample estimates:  
## mean of x mean of y   
## -9.3849421 0.6347196   
##   
##   
## Cohen's d  
##   
## d estimate: -1.664313 (large)  
## 95 percent confidence interval:  
## lower upper   
## -2.5845534 -0.7440734   
##   
## [1] 0.4275435  
## [1] "End of Error Clamp (32 trials)"  
##   
## Welch Two Sample t-test  
##   
## data: data$EC\_Late[data$Experiment == cond1 & data$Task == type] and data$EC\_Late[data$Experiment == cond2 & data$Task == type]  
## t = -4.209, df = 19.602, p-value = 0.0004481  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -16.936249 -5.702166  
## sample estimates:  
## mean of x mean of y   
## -10.556571 0.762636   
##   
##   
## Cohen's d  
##   
## d estimate: -1.584818 (large)  
## 95 percent confidence interval:  
## lower upper   
## -2.4939679 -0.6756687   
##   
## [1] 0.4037735

IndependentT(TtestData, "Continuous", "CursorJump", "Reaches")

## [1] "this is the between subjects comparison of condition Continuous to CursorJump Reaches Data"  
## [1] "Aligned"  
##   
## Welch Two Sample t-test  
##   
## data: data$Aligned[data$Experiment == cond1 & data$Task == type] and data$Aligned[data$Experiment == cond2 & data$Task == type]  
## t = -1.9358, df = 24.888, p-value = 0.06432  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -4.2797570 0.1329851  
## sample estimates:  
## mean of x mean of y   
## 1.036038 3.109424   
##   
##   
## Cohen's d  
##   
## d estimate: -0.7415064 (medium)  
## 95 percent confidence interval:  
## lower upper   
## -1.56153828 0.07852552   
##   
## [1] 0.1291102  
## [1] "Beginning of 1st rotation"  
##   
## Welch Two Sample t-test  
##   
## data: data$R1\_Early[data$Experiment == cond1 & data$Task == type] and data$R1\_Early[data$Experiment == cond2 & data$Task == type]  
## t = -2.5856, df = 20.128, p-value = 0.01761  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -15.538992 -1.665082  
## sample estimates:  
## mean of x mean of y   
## -8.2621381 0.3398989   
##   
##   
## Cohen's d  
##   
## d estimate: -0.9747338 (large)  
## 95 percent confidence interval:  
## lower upper   
## -1.8137176 -0.1357499   
##   
## [1] 0.2039337  
## [1] "End of 1st rotation"  
##   
## Welch Two Sample t-test  
##   
## data: data$R1\_Late[data$Experiment == cond1 & data$Task == type] and data$R1\_Late[data$Experiment == cond2 & data$Task == type]  
## t = 1.2956, df = 19.272, p-value = 0.2104  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -3.878798 16.514633  
## sample estimates:  
## mean of x mean of y   
## -29.78841 -36.10633   
##   
##   
## Cohen's d  
##   
## d estimate: 0.5082739 (medium)  
## 95 percent confidence interval:  
## lower upper   
## -0.2976764 1.3142242   
##   
## [1] 0.06512066  
## [1] "Beginning of 2nd rotation"  
##   
## Welch Two Sample t-test  
##   
## data: data$R2[data$Experiment == cond1 & data$Task == type] and data$R2[data$Experiment == cond2 & data$Task == type]  
## t = -1.509, df = 23.201, p-value = 0.1448  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -30.261069 4.726947  
## sample estimates:  
## mean of x mean of y   
## 13.77325 26.54031   
##   
##   
## Cohen's d  
##   
## d estimate: -0.5857656 (medium)  
## 95 percent confidence interval:  
## lower upper   
## -1.3958367 0.2243055   
##   
## [1] 0.08468133  
## [1] "Beginning of Error Clamp"  
##   
## Welch Two Sample t-test  
##   
## data: data$EC[data$Experiment == cond1 & data$Task == type] and data$EC[data$Experiment == cond2 & data$Task == type]  
## t = -4.4937, df = 23.636, p-value = 0.0001553  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -13.856315 -5.129373  
## sample estimates:  
## mean of x mean of y   
## -9.3849421 0.1079021   
##   
##   
## Cohen's d  
##   
## d estimate: -1.741805 (large)  
## 95 percent confidence interval:  
## lower upper   
## -2.6732419 -0.8103682   
##   
## [1] 0.4499526  
## [1] "End of Error Clamp (32 trials)"  
##   
## Welch Two Sample t-test  
##   
## data: data$EC\_Late[data$Experiment == cond1 & data$Task == type] and data$EC\_Late[data$Experiment == cond2 & data$Task == type]  
## t = -2.9511, df = 17.932, p-value = 0.00857  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -13.161695 -2.213286  
## sample estimates:  
## mean of x mean of y   
## -10.556571 -2.869081   
##   
##   
## Cohen's d  
##   
## d estimate: -1.107001 (large)  
## 95 percent confidence interval:  
## lower upper   
## -1.9587770 -0.2552252   
##   
## [1] 0.2483565

IndependentT(TtestData, "Terminal", "CursorJump", "Reaches")

## [1] "this is the between subjects comparison of condition Terminal to CursorJump Reaches Data"  
## [1] "Aligned"  
##   
## Welch Two Sample t-test  
##   
## data: data$Aligned[data$Experiment == cond1 & data$Task == type] and data$Aligned[data$Experiment == cond2 & data$Task == type]  
## t = 0.32227, df = 19.529, p-value = 0.7507  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -2.476101 3.379331  
## sample estimates:  
## mean of x mean of y   
## 3.561039 3.109424   
##   
##   
## Cohen's d  
##   
## d estimate: 0.1264041 (negligible)  
## 95 percent confidence interval:  
## lower upper   
## -0.6839315 0.9367397   
##   
## [1] 0.004308729  
## [1] "Beginning of 1st rotation"  
##   
## Welch Two Sample t-test  
##   
## data: data$R1\_Early[data$Experiment == cond1 & data$Task == type] and data$R1\_Early[data$Experiment == cond2 & data$Task == type]  
## t = -0.85917, df = 18.349, p-value = 0.4013  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -10.09359 4.22857  
## sample estimates:  
## mean of x mean of y   
## -2.5926097 0.3398989   
##   
##   
## Cohen's d  
##   
## d estimate: -0.3369947 (small)  
## 95 percent confidence interval:  
## lower upper   
## -1.1522480 0.4782586   
##   
## [1] 0.02983952  
## [1] "End of 1st rotation"  
##   
## Welch Two Sample t-test  
##   
## data: data$R1\_Late[data$Experiment == cond1 & data$Task == type] and data$R1\_Late[data$Experiment == cond2 & data$Task == type]  
## t = 0.69646, df = 22.201, p-value = 0.4934  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -9.734356 19.586036  
## sample estimates:  
## mean of x mean of y   
## -31.18049 -36.10633   
##   
##   
## Cohen's d  
##   
## d estimate: 0.2731735 (small)  
## 95 percent confidence interval:  
## lower upper   
## -0.5401209 1.0864680   
##   
## [1] 0.01981023  
## [1] "Beginning of 2nd rotation"  
##   
## Welch Two Sample t-test  
##   
## data: data$R2[data$Experiment == cond1 & data$Task == type] and data$R2[data$Experiment == cond2 & data$Task == type]  
## t = 0.43094, df = 23.647, p-value = 0.6704  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -14.52698 22.18668  
## sample estimates:  
## mean of x mean of y   
## 30.37016 26.54031   
##   
##   
## Cohen's d  
##   
## d estimate: 0.169028 (negligible)  
## 95 percent confidence interval:  
## lower upper   
## -0.6419439 0.9799998   
##   
## [1] 0.007678418  
## [1] "Beginning of Error Clamp"  
##   
## Welch Two Sample t-test  
##   
## data: data$EC[data$Experiment == cond1 & data$Task == type] and data$EC[data$Experiment == cond2 & data$Task == type]  
## t = 0.20819, df = 23.374, p-value = 0.8369  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -4.703248 5.756883  
## sample estimates:  
## mean of x mean of y   
## 0.6347196 0.1079021   
##   
##   
## Cohen's d  
##   
## d estimate: 0.08165845 (negligible)  
## 95 percent confidence interval:  
## lower upper   
## -0.7282065 0.8915234   
##   
## [1] 0.001802689  
## [1] "End of Error Clamp (32 trials)"  
##   
## Welch Two Sample t-test  
##   
## data: data$EC\_Late[data$Experiment == cond1 & data$Task == type] and data$EC\_Late[data$Experiment == cond2 & data$Task == type]  
## t = 2.2085, df = 23.363, p-value = 0.03729  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## 0.2328281 7.0306058  
## sample estimates:  
## mean of x mean of y   
## 0.762636 -2.869081   
##   
##   
## Cohen's d  
##   
## d estimate: 0.8662316 (large)  
## 95 percent confidence interval:  
## lower upper   
## 0.01959008 1.71287314   
##   
## [1] 0.168898

IndependentT(TtestData, "Continuous", "Terminal", "No-Cursors")

## [1] "this is the between subjects comparison of condition Continuous to Terminal No-Cursors Data"  
## [1] "Aligned"  
##   
## Welch Two Sample t-test  
##   
## data: data$Aligned[data$Experiment == cond1 & data$Task == type] and data$Aligned[data$Experiment == cond2 & data$Task == type]  
## t = -0.75294, df = 26.919, p-value = 0.458  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -2.898918 1.342648  
## sample estimates:  
## mean of x mean of y   
## 2.027313 2.805448   
##   
##   
## Cohen's d  
##   
## d estimate: -0.2796335 (small)  
## 95 percent confidence interval:  
## lower upper   
## -1.0458306 0.4865637   
##   
## [1] 0.02054102  
## [1] "Beginning of 1st rotation"  
##   
## Welch Two Sample t-test  
##   
## data: data$R1\_Early[data$Experiment == cond1 & data$Task == type] and data$R1\_Early[data$Experiment == cond2 & data$Task == type]  
## t = -3.8743, df = 26.182, p-value = 0.0006424  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -10.942940 -3.357992  
## sample estimates:  
## mean of x mean of y   
## -10.405627 -3.255161   
##   
##   
## Cohen's d  
##   
## d estimate: -1.445167 (large)  
## 95 percent confidence interval:  
## lower upper   
## -2.301309 -0.589025   
##   
## [1] 0.3590304  
## [1] "End of 1st rotation"  
##   
## Welch Two Sample t-test  
##   
## data: data$R1\_Late[data$Experiment == cond1 & data$Task == type] and data$R1\_Late[data$Experiment == cond2 & data$Task == type]  
## t = -3.7661, df = 25.985, p-value = 0.0008585  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -25.22742 -7.41224  
## sample estimates:  
## mean of x mean of y   
## -27.81193 -11.49211   
##   
##   
## Cohen's d  
##   
## d estimate: -1.386237 (large)  
## 95 percent confidence interval:  
## lower upper   
## -2.2352760 -0.5371973   
##   
## [1] 0.3401019  
## [1] "Beginning of 2nd rotation"  
##   
## Welch Two Sample t-test  
##   
## data: data$R2[data$Experiment == cond1 & data$Task == type] and data$R2[data$Experiment == cond2 & data$Task == type]  
## t = -3.4546, df = 26.275, p-value = 0.001884  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -15.25227 -3.87639  
## sample estimates:  
## mean of x mean of y   
## -1.398892 8.165436   
##   
##   
## Cohen's d  
##   
## d estimate: -1.273003 (large)  
## 95 percent confidence interval:  
## lower upper   
## -2.1090718 -0.4369343   
##   
## [1] 0.3029546  
## [1] "Beginning of Error Clamp"  
##   
## Welch Two Sample t-test  
##   
## data: data$EC[data$Experiment == cond1 & data$Task == type] and data$EC[data$Experiment == cond2 & data$Task == type]  
## t = -4.725, df = 27, p-value = 6.378e-05  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -11.767062 -4.641612  
## sample estimates:  
## mean of x mean of y   
## -7.7240628 0.4802742   
##   
##   
## Cohen's d  
##   
## d estimate: -1.751432 (large)  
## 95 percent confidence interval:  
## lower upper   
## -2.6481163 -0.8547486   
##   
## [1] 0.451365  
## [1] "End of Error Clamp (32 trials)"  
##   
## Welch Two Sample t-test  
##   
## data: data$EC\_Late[data$Experiment == cond1 & data$Task == type] and data$EC\_Late[data$Experiment == cond2 & data$Task == type]  
## t = -3.7662, df = 25.406, p-value = 0.0008827  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -10.829062 -3.176426  
## sample estimates:  
## mean of x mean of y   
## -7.4117773 -0.4090331   
##   
##   
## Cohen's d  
##   
## d estimate: -1.408615 (large)  
## 95 percent confidence interval:  
## lower upper   
## -2.2603237 -0.5569063   
##   
## [1] 0.3473266

IndependentT(TtestData, "Continuous", "CursorJump", "No-Cursors")

## [1] "this is the between subjects comparison of condition Continuous to CursorJump No-Cursors Data"  
## [1] "Aligned"  
##   
## Welch Two Sample t-test  
##   
## data: data$Aligned[data$Experiment == cond1 & data$Task == type] and data$Aligned[data$Experiment == cond2 & data$Task == type]  
## t = 0.29348, df = 23.683, p-value = 0.7717  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -1.635561 2.177359  
## sample estimates:  
## mean of x mean of y   
## 2.027313 1.756413   
##   
##   
## Cohen's d  
##   
## d estimate: 0.1116984 (negligible)  
## 95 percent confidence interval:  
## lower upper   
## -0.6821801 0.9055769   
##   
## [1] 0.003352764  
## [1] "Beginning of 1st rotation"  
##   
## Welch Two Sample t-test  
##   
## data: data$R1\_Early[data$Experiment == cond1 & data$Task == type] and data$R1\_Early[data$Experiment == cond2 & data$Task == type]  
## t = -4.9944, df = 23.326, p-value = 4.553e-05  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -12.166556 -5.043644  
## sample estimates:  
## mean of x mean of y   
## -10.405627 -1.800527   
##   
##   
## Cohen's d  
##   
## d estimate: -1.898579 (large)  
## 95 percent confidence interval:  
## lower upper   
## -2.853777 -0.943380   
##   
## [1] 0.4928767  
## [1] "End of 1st rotation"  
##   
## Welch Two Sample t-test  
##   
## data: data$R1\_Late[data$Experiment == cond1 & data$Task == type] and data$R1\_Late[data$Experiment == cond2 & data$Task == type]  
## t = -4.861, df = 24.86, p-value = 5.416e-05  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -24.85073 -10.05680  
## sample estimates:  
## mean of x mean of y   
## -27.81193 -10.35817   
##   
##   
## Cohen's d  
##   
## d estimate: -1.861423 (large)  
## 95 percent confidence interval:  
## lower upper   
## -2.8108595 -0.9119857   
##   
## [1] 0.4830006  
## [1] "Beginning of 2nd rotation"  
##   
## Welch Two Sample t-test  
##   
## data: data$R2[data$Experiment == cond1 & data$Task == type] and data$R2[data$Experiment == cond2 & data$Task == type]  
## t = -1.4166, df = 19.669, p-value = 0.1722  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -12.014709 2.302172  
## sample estimates:  
## mean of x mean of y   
## -1.398892 3.457377   
##   
##   
## Cohen's d  
##   
## d estimate: -0.5552115 (medium)  
## 95 percent confidence interval:  
## lower upper   
## -1.3635906 0.2531677   
##   
## [1] 0.07673783  
## [1] "Beginning of Error Clamp"  
##   
## Welch Two Sample t-test  
##   
## data: data$EC[data$Experiment == cond1 & data$Task == type] and data$EC[data$Experiment == cond2 & data$Task == type]  
## t = -2.3211, df = 22.305, p-value = 0.0298  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -8.9977220 -0.5096678  
## sample estimates:  
## mean of x mean of y   
## -7.724063 -2.970368   
##   
##   
## Cohen's d  
##   
## d estimate: -0.9034695 (large)  
## 95 percent confidence interval:  
## lower upper   
## -1.73616398 -0.07077509   
##   
## [1] 0.1803864  
## [1] "End of Error Clamp (32 trials)"  
##   
## Welch Two Sample t-test  
##   
## data: data$EC\_Late[data$Experiment == cond1 & data$Task == type] and data$EC\_Late[data$Experiment == cond2 & data$Task == type]  
## t = -3.2751, df = 19.424, p-value = 0.003896  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -8.754367 -1.933906  
## sample estimates:  
## mean of x mean of y   
## -7.411777 -2.067641   
##   
##   
## Cohen's d  
##   
## d estimate: -1.232677 (large)  
## 95 percent confidence interval:  
## lower upper   
## -2.0979053 -0.3674496   
##   
## [1] 0.2906295

IndependentT(TtestData, "Terminal", "CursorJump", "No-Cursors")

## [1] "this is the between subjects comparison of condition Terminal to CursorJump No-Cursors Data"  
## [1] "Aligned"  
##   
## Welch Two Sample t-test  
##   
## data: data$Aligned[data$Experiment == cond1 & data$Task == type] and data$Aligned[data$Experiment == cond2 & data$Task == type]  
## t = 1.1493, df = 25.159, p-value = 0.2613  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -0.8302889 2.9283576  
## sample estimates:  
## mean of x mean of y   
## 2.805448 1.756413   
##   
##   
## Cohen's d  
##   
## d estimate: 0.4251378 (small)  
## 95 percent confidence interval:  
## lower upper   
## -0.3624742 1.2127497   
##   
## [1] 0.04617747  
## [1] "Beginning of 1st rotation"  
##   
## Welch Two Sample t-test  
##   
## data: data$R1\_Early[data$Experiment == cond1 & data$Task == type] and data$R1\_Early[data$Experiment == cond2 & data$Task == type]  
## t = -0.92126, df = 25.748, p-value = 0.3655  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -4.701787 1.792518  
## sample estimates:  
## mean of x mean of y   
## -3.255161 -1.800527   
##   
##   
## Cohen's d  
##   
## d estimate: -0.342838 (small)  
## 95 percent confidence interval:  
## lower upper   
## -1.1274167 0.4417408   
##   
## [1] 0.03052241  
## [1] "End of 1st rotation"  
##   
## Welch Two Sample t-test  
##   
## data: data$R1\_Late[data$Experiment == cond1 & data$Task == type] and data$R1\_Late[data$Experiment == cond2 & data$Task == type]  
## t = -0.27265, df = 24.304, p-value = 0.7874  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -9.711804 7.443936  
## sample estimates:  
## mean of x mean of y   
## -11.49211 -10.35817   
##   
##   
## Cohen's d  
##   
## d estimate: -0.1002842 (negligible)  
## 95 percent confidence interval:  
## lower upper   
## -0.8796778 0.6791094   
##   
## [1] 0.002686583  
## [1] "Beginning of 2nd rotation"  
##   
## Welch Two Sample t-test  
##   
## data: data$R2[data$Experiment == cond1 & data$Task == type] and data$R2[data$Experiment == cond2 & data$Task == type]  
## t = 1.2906, df = 22.641, p-value = 0.2099  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -2.844917 12.261036  
## sample estimates:  
## mean of x mean of y   
## 8.165436 3.457377   
##   
##   
## Cohen's d  
##   
## d estimate: 0.4978772 (small)  
## 95 percent confidence interval:  
## lower upper   
## -0.292944 1.288698   
##   
## [1] 0.06226283  
## [1] "Beginning of Error Clamp"  
##   
## Welch Two Sample t-test  
##   
## data: data$EC[data$Experiment == cond1 & data$Task == type] and data$EC[data$Experiment == cond2 & data$Task == type]  
## t = 1.6633, df = 23.133, p-value = 0.1098  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -0.8396958 7.7409801  
## sample estimates:  
## mean of x mean of y   
## 0.4802742 -2.9703679   
##   
##   
## Cohen's d  
##   
## d estimate: 0.640003 (medium)  
## 95 percent confidence interval:  
## lower upper   
## -0.1584957 1.4385017   
##   
## [1] 0.09886799  
## [1] "End of Error Clamp (32 trials)"  
##   
## Welch Two Sample t-test  
##   
## data: data$EC\_Late[data$Experiment == cond1 & data$Task == type] and data$EC\_Late[data$Experiment == cond2 & data$Task == type]  
## t = 1.1954, df = 23.351, p-value = 0.2439  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## -1.209368 4.526584  
## sample estimates:  
## mean of x mean of y   
## -0.4090331 -2.0676409   
##   
##   
## Cohen's d  
##   
## d estimate: 0.4374421 (small)  
## 95 percent confidence interval:  
## lower upper   
## -0.3506781 1.2255622   
##   
## [1] 0.04875687