runAnalysis.R

roohac

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library(readxl)

## Warning: package 'readxl' was built under R version 3.3.3

source('~/GitHub/NIOSH-Nurses/performanceAnalysisFunctions.R', echo=TRUE)

##   
## > Output\_lme\_performance\_nurses\_study <- function(PVT,   
## + OB, GNG, post\_hoc) {  
## + library(nlme)  
## + library(lsmeans)  
## + library(ggplot2)  
## + .... [TRUNCATED]   
##   
## > pval\_postHoc\_OutPut <- function(outcomemeasureTitle,   
## + nlme\_model, modelData, post\_hoc) {  
## + library(dplyr)  
## + post\_hoc2 <- FALSE  
## + m .... [TRUNCATED]

source('~/GitHub/NIOSH-Nurses/IVISAnalysisFunctions.R', echo=TRUE)

##   
## > Output\_lme\_ISIV\_nurses\_study <- function(ISIV, post\_hoc) {  
## + library(nlme)  
## + library(lsmeans)  
## + library(ggplot2)  
## + library(Rmisc)  
## + .... [TRUNCATED]   
##   
## > pval\_postHoc\_OutPut <- function(outcomemeasureTitle,   
## + nlme\_model, modelData, post\_hoc) {  
## + model\_r2 <- r.squaredGLMM(nlme\_model)  
## + mod .... [TRUNCATED]

source('~/GitHub/NIOSH-Nurses/actiwatchAnalysisFunctions.R', echo=TRUE)

##   
## > Output\_lme\_actiWatch\_nurses\_study <- function(acti\_watch,   
## + post\_hoc) {  
## + library(nlme)  
## + library(lsmeans)  
## + library(ggplot2)  
## + .... [TRUNCATED]   
##   
## > pval\_postHoc\_OutPut <- function(outcomemeasureTitle,   
## + nlme\_model, modelData, post\_hoc) {  
## + model\_r2 <- r.squaredGLMM(nlme\_model)  
## + mod .... [TRUNCATED]

PVT <- read\_excel("//root/public/roohac/nurses\_study/completed-nurses/full\_data\_sets/processedtime2/Nurses\_Study\_Summary\_Tables\_2018\_02\_21\_15\_23\_37\_Complete.xlsx",   
 sheet = "PVT")  
  
GNG <- read\_excel("//root/public/roohac/nurses\_study/completed-nurses/full\_data\_sets/processedtime2/Nurses\_Study\_Summary\_Tables\_2018\_02\_21\_15\_23\_37\_Complete.xlsx",   
 sheet = "GNG")  
  
OB <- read\_excel("//root/public/roohac/nurses\_study/completed-nurses/full\_data\_sets/processedtime2/Nurses\_Study\_Summary\_Tables\_2018\_02\_21\_15\_23\_37\_Complete.xlsx",   
 sheet = "OB")  
  
acti\_watch <- read\_excel("//root/projects/NIOSH\_RedLightForShiftWorkers/Actiware data/acti-watchSummary\_2-12-18.xlsx")  
  
ISIV <- read\_excel("//root/projects/NIOSH\_RedLightForShiftWorkers/Actiware data/NIOSH\_Nurses\_Actiwatch\_BaselineIntervention\_ISIV.xlsx")  
  
  
  
performance\_outputList <- Output\_lme\_performance\_nurses\_study(PVT, OB, GNG, TRUE)

## Warning: package 'lsmeans' was built under R version 3.3.3

## Loading required package: estimability

## Warning: package 'ggplot2' was built under R version 3.3.3

## Loading required package: lattice

## Loading required package: plyr

## Warning: package 'MuMIn' was built under R version 3.3.3

## Warning: package 'dplyr' was built under R version 3.3.3

##   
## Attaching package: 'dplyr'

## The following objects are masked from 'package:plyr':  
##   
## arrange, count, desc, failwith, id, mutate, rename, summarise,  
## summarize

## The following object is masked from 'package:nlme':  
##   
## collapse

## The following objects are masked from 'package:stats':  
##   
## filter, lag

## The following objects are masked from 'package:base':  
##   
## intersect, setdiff, setequal, union

## NOTE: Results may be misleading due to involvement in interactions  
## NOTE: Results may be misleading due to involvement in interactions  
## NOTE: Results may be misleading due to involvement in interactions  
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## NOTE: Results may be misleading due to involvement in interactions  
## NOTE: Results may be misleading due to involvement in interactions

actiwatch\_outputList <- Output\_lme\_actiWatch\_nurses\_study(acti\_watch, TRUE)  
  
  
IVIS\_outputList <- Output\_lme\_ISIV\_nurses\_study(ISIV, TRUE)

## NOTE: Results may be misleading due to involvement in interactions

performance\_outputList

## [[1]]  
## [[1]][[1]]  
## [[1]][[1]][[1]]  
## [1] "GNG Hits"  
##   
## [[1]][[1]][[2]]  
## R2m R2c   
## 0.01415085 0.09400453   
##   
## [[1]][[1]][[3]]  
## numDF denDF F.value p.value  
## (Intercept) 1 1606 1.400941e+05 0.0000000  
## Condition\_period 5 82 1.027942e+00 0.4067777  
## TimeBin 2 1606 5.325856e-01 0.5871887  
## Shift 1 39 2.471382e-01 0.6218885  
## Condition\_period:TimeBin 10 1606 8.370338e-01 0.5928055  
## Condition\_period:Shift 5 82 9.380042e-01 0.4609473  
## TimeBin:Shift 2 1606 8.343214e-01 0.4343571  
## Condition\_period:TimeBin:Shift 10 1606 3.509281e-01 0.9666148  
##   
##   
## [[1]][[2]]  
## [[1]][[2]][[1]]  
## [1] "No significance found in GNG Hits . Therefore no post-hoc tests."  
##   
##   
##   
## [[2]]  
## [[2]][[1]]  
## [[2]][[1]][[1]]  
## [1] "GNG false positve"  
##   
## [[2]][[1]][[2]]  
## R2m R2c   
## 0.01883032 0.35068420   
##   
## [[2]][[1]][[3]]  
## numDF denDF F.value p.value  
## (Intercept) 1 1606 84.5093713 0.0000000  
## Condition\_period 5 82 1.1276889 0.3523270  
## TimeBin 2 1606 0.1690975 0.8444416  
## Shift 1 39 0.8279515 0.3684551  
## Condition\_period:TimeBin 10 1606 1.3550072 0.1956904  
## Condition\_period:Shift 5 82 0.4484132 0.8132829  
## TimeBin:Shift 2 1606 1.1087050 0.3302384  
## Condition\_period:TimeBin:Shift 10 1606 0.7644567 0.6634285  
##   
##   
## [[2]][[2]]  
## [[2]][[2]][[1]]  
## [1] "No significance found in GNG false positve . Therefore no post-hoc tests."  
##   
##   
##   
## [[3]]  
## [[3]][[1]]  
## [[3]][[1]][[1]]  
## [1] "GNG mean response time"  
##   
## [[3]][[1]][[2]]  
## R2m R2c   
## 0.04008205 0.64246947   
##   
## [[3]][[1]][[3]]  
## numDF denDF F.value p.value  
## (Intercept) 1 1606 1944.7852886 0.00000000  
## Condition\_period 5 82 1.1516565 0.34012786  
## TimeBin 2 1606 4.1343561 0.01618372  
## Shift 1 39 2.0341619 0.16175529  
## Condition\_period:TimeBin 10 1606 1.1794711 0.29999160  
## Condition\_period:Shift 5 82 0.6784847 0.64096160  
## TimeBin:Shift 2 1606 0.7295908 0.48226593  
## Condition\_period:TimeBin:Shift 10 1606 1.4937618 0.13554316  
##   
##   
## [[3]][[2]]  
## [[3]][[2]][[1]]  
## [1] "TimeBin"  
##   
## [[3]][[2]][[2]]  
## $lsmeans  
## TimeBin lsmean SE df lower.CL upper.CL  
## 1 0.5111940 0.01246894 39 0.4859732 0.5364148  
## 2 0.5155515 0.01245451 39 0.4903599 0.5407431  
## 3 0.5226642 0.01242876 39 0.4975246 0.5478037  
##   
## Results are averaged over the levels of: Condition\_period, Shift   
## Confidence level used: 0.95   
##   
## $contrasts  
## contrast estimate SE df t.ratio p.value  
## 1 - 2 -0.004357533 0.003780072 1606 -1.153 0.4818  
## 1 - 3 -0.011470192 0.003689462 1606 -3.109 0.0054  
## 2 - 3 -0.007112659 0.003649287 1606 -1.949 0.1255  
##   
## Results are averaged over the levels of: Condition\_period, Shift   
## P value adjustment: tukey method for comparing a family of 3 estimates   
##   
##   
##   
##   
## [[4]]  
## [[4]][[1]]  
## [[4]][[1]][[1]]  
## [1] "GNG median response time"  
##   
## [[4]][[1]][[2]]  
## R2m R2c   
## 0.03469269 0.66500948   
##   
## [[4]][[1]][[3]]  
## numDF denDF F.value p.value  
## (Intercept) 1 1606 2436.4446850 0.00000000  
## Condition\_period 5 82 1.8306732 0.11587935  
## TimeBin 2 1606 4.5224926 0.01100061  
## Shift 1 39 1.6605677 0.20511889  
## Condition\_period:TimeBin 10 1606 1.0174020 0.42595227  
## Condition\_period:Shift 5 82 0.2151754 0.95513626  
## TimeBin:Shift 2 1606 1.8835522 0.15238476  
## Condition\_period:TimeBin:Shift 10 1606 1.5244436 0.12458158  
##   
##   
## [[4]][[2]]  
## [[4]][[2]][[1]]  
## [1] "TimeBin"  
##   
## [[4]][[2]][[2]]  
## $lsmeans  
## TimeBin lsmean SE df lower.CL upper.CL  
## 1 0.4819924 0.01050718 39 0.4607396 0.5032452  
## 2 0.4875080 0.01049609 39 0.4662777 0.5087384  
## 3 0.4919719 0.01047694 39 0.4707803 0.5131635  
##   
## Results are averaged over the levels of: Condition\_period, Shift   
## Confidence level used: 0.95   
##   
## $contrasts  
## contrast estimate SE df t.ratio p.value  
## 1 - 2 -0.005515673 0.002995284 1606 -1.841 0.1565  
## 1 - 3 -0.009979539 0.002923175 1606 -3.414 0.0019  
## 2 - 3 -0.004463865 0.002891476 1606 -1.544 0.2708  
##   
## Results are averaged over the levels of: Condition\_period, Shift   
## P value adjustment: tukey method for comparing a family of 3 estimates   
##   
##   
##   
##   
## [[5]]  
## [[5]][[1]]  
## [[5]][[1]][[1]]  
## [1] "OB accuracy"  
##   
## [[5]][[1]][[2]]  
## R2m R2c   
## 0.03015494 0.32884058   
##   
## [[5]][[1]][[3]]  
## numDF denDF F.value p.value  
## (Intercept) 1 1286 5.657439e+04 0.000000000  
## Condition\_period 5 124 2.554619e-01 0.936359194  
## TimeBin 2 1286 5.906503e+00 0.002796072  
## Shift 1 36 9.135511e-01 0.345548680  
## Condition\_period:TimeBin 10 1286 1.079156e+00 0.374920403  
## Condition\_period:Shift 5 124 1.418475e+00 0.222160611  
## TimeBin:Shift 2 1286 3.022829e+00 0.049009283  
## Condition\_period:TimeBin:Shift 10 1286 7.573072e-01 0.670338515  
##   
##   
## [[5]][[2]]  
## [[5]][[2]][[1]]  
## [[5]][[2]][[1]][[1]]  
## [1] "TimeBin"  
##   
## [[5]][[2]][[1]][[2]]  
## $lsmeans  
## TimeBin lsmean SE df lower.CL upper.CL  
## 1 0.9572591 0.004604937 36 0.9479198 0.9665983  
## 2 0.9540691 0.004587953 36 0.9447643 0.9633739  
## 3 0.9513559 0.004545636 36 0.9421370 0.9605749  
##   
## Results are averaged over the levels of: Condition\_period, Shift   
## Confidence level used: 0.95   
##   
## $contrasts  
## contrast estimate SE df t.ratio p.value  
## 1 - 2 0.003189953 0.002602457 1286 1.226 0.4381  
## 1 - 3 0.005903121 0.002545992 1286 2.319 0.0536  
## 2 - 3 0.002713168 0.002511983 1286 1.080 0.5266  
##   
## Results are averaged over the levels of: Condition\_period, Shift   
## P value adjustment: tukey method for comparing a family of 3 estimates   
##   
##   
##   
## [[5]][[2]][[2]]  
## [[5]][[2]][[2]][[1]]  
## [1] "TimeBin:Shift"  
##   
## [[5]][[2]][[2]][[2]]  
## $lsmeans  
## Shift = day:  
## TimeBin lsmean SE df lower.CL upper.CL  
## 1 0.9572915 0.005119892 37 0.9469176 0.9676654  
## 2 0.9483101 0.005138475 37 0.9378986 0.9587216  
## 3 0.9461987 0.005062378 37 0.9359414 0.9564561  
##   
## Shift = night:  
## TimeBin lsmean SE df lower.CL upper.CL  
## 1 0.9572266 0.007655616 36 0.9417003 0.9727530  
## 2 0.9598281 0.007602192 36 0.9444102 0.9752461  
## 3 0.9565132 0.007551394 36 0.9411983 0.9718281  
##   
## Results are averaged over the levels of: Condition\_period   
## Confidence level used: 0.95   
##   
## $contrasts  
## Shift = day:  
## contrast estimate SE df t.ratio p.value  
## 1 - 2 0.0089813827 0.002919251 1286 3.077 0.0061  
## 1 - 3 0.0110927880 0.002821739 1286 3.931 0.0003  
## 2 - 3 0.0021114052 0.002845287 1286 0.742 0.7385  
##   
## Shift = night:  
## contrast estimate SE df t.ratio p.value  
## 1 - 2 -0.0026014768 0.004309188 1286 -0.604 0.8181  
## 1 - 3 0.0007134549 0.004238642 1286 0.168 0.9845  
## 2 - 3 0.0033149317 0.004140601 1286 0.801 0.7027  
##   
## Results are averaged over the levels of: Condition\_period   
## P value adjustment: tukey method for comparing a family of 3 estimates   
##   
##   
##   
##   
##   
## [[6]]  
## [[6]][[1]]  
## [[6]][[1]][[1]]  
## [1] "OB correct matches"  
##   
## [[6]][[1]][[2]]  
## R2m R2c   
## 0.03035216 0.54294628   
##   
## [[6]][[1]][[3]]  
## numDF denDF F.value p.value  
## (Intercept) 1 1286 1145.9914792 0.0000000000  
## Condition\_period 5 124 0.7135369 0.6143930987  
## TimeBin 2 1286 8.9264520 0.0001412388  
## Shift 1 36 1.0011759 0.3237045664  
## Condition\_period:TimeBin 10 1286 0.6436974 0.7769643523  
## Condition\_period:Shift 5 124 0.8805546 0.4963225125  
## TimeBin:Shift 2 1286 3.7803934 0.0230676581  
## Condition\_period:TimeBin:Shift 10 1286 0.9724530 0.4655693765  
##   
##   
## [[6]][[2]]  
## [[6]][[2]][[1]]  
## [[6]][[2]][[1]][[1]]  
## [1] "TimeBin"  
##   
## [[6]][[2]][[1]][[2]]  
## $lsmeans  
## TimeBin lsmean SE df lower.CL upper.CL  
## 1 5.799133 0.1839478 36 5.426070 6.172197  
## 2 5.683388 0.1837087 36 5.310810 6.055967  
## 3 5.604125 0.1828957 36 5.233195 5.975054  
##   
## Results are averaged over the levels of: Condition\_period, Shift   
## Confidence level used: 0.95   
##   
## $contrasts  
## contrast estimate SE df t.ratio p.value  
## 1 - 2 0.11574503 0.06849244 1286 1.690 0.2094  
## 1 - 3 0.19500856 0.06698372 1286 2.911 0.0102  
## 2 - 3 0.07926353 0.06606594 1286 1.200 0.4535  
##   
## Results are averaged over the levels of: Condition\_period, Shift   
## P value adjustment: tukey method for comparing a family of 3 estimates   
##   
##   
##   
## [[6]][[2]][[2]]  
## [[6]][[2]][[2]][[1]]  
## [1] "TimeBin:Shift"  
##   
## [[6]][[2]][[2]][[2]]  
## $lsmeans  
## Shift = day:  
## TimeBin lsmean SE df lower.CL upper.CL  
## 1 5.738301 0.2053698 37 5.322182 6.154419  
## 2 5.444459 0.2057140 37 5.027643 5.861275  
## 3 5.392611 0.2043459 37 4.978567 5.806655  
##   
## Shift = night:  
## TimeBin lsmean SE df lower.CL upper.CL  
## 1 5.859966 0.3052383 36 5.240914 6.479018  
## 2 5.922318 0.3044295 36 5.304906 6.539729  
## 3 5.815638 0.3033909 36 5.200333 6.430944  
##   
## Results are averaged over the levels of: Condition\_period   
## Confidence level used: 0.95   
##   
## $contrasts  
## Shift = day:  
## contrast estimate SE df t.ratio p.value  
## 1 - 2 0.29384186 0.07678336 1286 3.827 0.0004  
## 1 - 3 0.34568965 0.07422431 1286 4.657 <.0001  
## 2 - 3 0.05184778 0.07484985 1286 0.693 0.7678  
##   
## Shift = night:  
## contrast estimate SE df t.ratio p.value  
## 1 - 2 -0.06235181 0.11344236 1286 -0.550 0.8467  
## 1 - 3 0.04432748 0.11152591 1286 0.397 0.9166  
## 2 - 3 0.10667928 0.10888678 1286 0.980 0.5898  
##   
## Results are averaged over the levels of: Condition\_period   
## P value adjustment: tukey method for comparing a family of 3 estimates   
##   
##   
##   
##   
##   
## [[7]]  
## [[7]][[1]]  
## [[7]][[1]][[1]]  
## [1] "OB no correct matches"  
##   
## [[7]][[1]][[2]]  
## R2m R2c   
## 0.01145589 0.93534955   
##   
## [[7]][[1]][[3]]  
## numDF denDF F.value p.value  
## (Intercept) 1 1286 1333.8436352 0.0000000  
## Condition\_period 5 124 1.0601188 0.3858243  
## TimeBin 2 1286 1.9332078 0.1451036  
## Shift 1 36 0.4028533 0.5296327  
## Condition\_period:TimeBin 10 1286 0.7944045 0.6342865  
## Condition\_period:Shift 5 124 0.1456109 0.9810123  
## TimeBin:Shift 2 1286 1.5067688 0.2220159  
## Condition\_period:TimeBin:Shift 10 1286 0.9848128 0.4545447  
##   
##   
## [[7]][[2]]  
## [[7]][[2]][[1]]  
## [1] "No significance found in OB no correct matches . Therefore no post-hoc tests."  
##   
##   
##   
## [[8]]  
## [[8]][[1]]  
## [[8]][[1]][[1]]  
## [1] "OB mean response time"  
##   
## [[8]][[1]][[2]]  
## R2m R2c   
## 0.0304212 0.8266542   
##   
## [[8]][[1]][[3]]  
## numDF denDF F.value p.value  
## (Intercept) 1 1286 653.4509271 0.000000e+00  
## Condition\_period 5 124 2.3149516 4.758868e-02  
## TimeBin 2 1286 9.9445207 5.178529e-05  
## Shift 1 36 0.6706748 4.182050e-01  
## Condition\_period:TimeBin 10 1286 1.4078342 1.709346e-01  
## Condition\_period:Shift 5 124 0.3503784 8.811845e-01  
## TimeBin:Shift 2 1286 1.0776673 3.406958e-01  
## Condition\_period:TimeBin:Shift 10 1286 3.1291717 5.838374e-04  
##   
##   
## [[8]][[2]]  
## [[8]][[2]][[1]]  
## [[8]][[2]][[1]][[1]]  
## [1] "TimeBin"  
##   
## [[8]][[2]][[1]][[2]]  
## $lsmeans  
## TimeBin lsmean SE df lower.CL upper.CL  
## 1 0.7620104 0.03137567 36 0.6983776 0.8256432  
## 2 0.7522225 0.03137172 36 0.6885977 0.8158473  
## 3 0.7386505 0.03133138 36 0.6751075 0.8021935  
##   
## Results are averaged over the levels of: Condition\_period, Shift   
## Confidence level used: 0.95   
##   
## $contrasts  
## contrast estimate SE df t.ratio p.value  
## 1 - 2 0.009787893 0.006102647 1286 1.604 0.2443  
## 1 - 3 0.023359909 0.005974031 1286 3.910 0.0003  
## 2 - 3 0.013572016 0.005879643 1286 2.308 0.0550  
##   
## Results are averaged over the levels of: Condition\_period, Shift   
## P value adjustment: tukey method for comparing a family of 3 estimates   
##   
##   
##   
## [[8]][[2]][[2]]  
## [[8]][[2]][[2]][[1]]  
## [1] "Condition\_period"  
##   
## [[8]][[2]][[2]][[2]]  
## $lsmeans  
## Condition\_period lsmean SE df lower.CL upper.CL  
## b\_b 0.7401843 0.03321134 36 0.6728285 0.8075400  
## b\_i 0.7434494 0.03420616 36 0.6740761 0.8128227  
## r\_b 0.7747328 0.03342434 36 0.7069451 0.8425205  
## r\_i 0.7393429 0.03367193 36 0.6710531 0.8076328  
## w\_b 0.7696683 0.03313537 36 0.7024666 0.8368699  
## w\_i 0.7383893 0.03312289 36 0.6712130 0.8055656  
##   
## Results are averaged over the levels of: TimeBin, Shift   
## Confidence level used: 0.95   
##   
## $contrasts  
## contrast estimate SE df t.ratio p.value  
## b\_b - b\_i -0.0032651645 0.01943268 124 -0.168 1.0000  
## b\_b - r\_b -0.0345485248 0.01840217 124 -1.877 0.4209  
## b\_b - r\_i 0.0008413389 0.01879751 124 0.045 1.0000  
## b\_b - w\_b -0.0294839823 0.01806771 124 -1.632 0.5792  
## b\_b - w\_i 0.0017949763 0.01801690 124 0.100 1.0000  
## b\_i - r\_b -0.0312833603 0.02023627 124 -1.546 0.6354  
## b\_i - r\_i 0.0041065033 0.02037019 124 0.202 1.0000  
## b\_i - w\_b -0.0262188178 0.01995347 124 -1.314 0.7768  
## b\_i - w\_i 0.0050601408 0.01984868 124 0.255 0.9999  
## r\_b - r\_i 0.0353898637 0.01851356 124 1.912 0.4001  
## r\_b - w\_b 0.0050645425 0.01839506 124 0.275 0.9998  
## r\_b - w\_i 0.0363435011 0.01835275 124 1.980 0.3595  
## r\_i - w\_b -0.0303253211 0.01868864 124 -1.623 0.5853  
## r\_i - w\_i 0.0009536375 0.01865244 124 0.051 1.0000  
## w\_b - w\_i 0.0312789586 0.01700222 124 1.840 0.4444  
##   
## Results are averaged over the levels of: TimeBin, Shift   
## P value adjustment: tukey method for comparing a family of 6 estimates   
##   
##   
##   
##   
##   
## [[9]]  
## [[9]][[1]]  
## [[9]][[1]][[1]]  
## [1] "OB median response time"  
##   
## [[9]][[1]][[2]]  
## R2m R2c   
## 0.0352373 0.7869033   
##   
## [[9]][[1]][[3]]  
## numDF denDF F.value p.value  
## (Intercept) 1 1286 1019.9501284 0.000000e+00  
## Condition\_period 5 124 2.7976602 1.980759e-02  
## TimeBin 2 1286 11.9300164 7.350856e-06  
## Shift 1 36 0.6907783 4.113785e-01  
## Condition\_period:TimeBin 10 1286 0.9185878 5.149549e-01  
## Condition\_period:Shift 5 124 0.3548752 8.782832e-01  
## TimeBin:Shift 2 1286 1.2449441 2.883038e-01  
## Condition\_period:TimeBin:Shift 10 1286 3.4786112 1.561142e-04  
##   
##   
## [[9]][[2]]  
## [[9]][[2]][[1]]  
## [[9]][[2]][[1]][[1]]  
## [1] "TimeBin"  
##   
## [[9]][[2]][[1]][[2]]  
## $lsmeans  
## TimeBin lsmean SE df lower.CL upper.CL  
## 1 0.6892442 0.02290012 36 0.6428006 0.7356878  
## 2 0.6857510 0.02289556 36 0.6393166 0.7321853  
## 3 0.6702855 0.02285774 36 0.6239279 0.7166432  
##   
## Results are averaged over the levels of: Condition\_period, Shift   
## Confidence level used: 0.95   
##   
## $contrasts  
## contrast estimate SE df t.ratio p.value  
## 1 - 2 0.003493236 0.005073180 1286 0.689 0.7702  
## 1 - 3 0.018958674 0.004965676 1286 3.818 0.0004  
## 2 - 3 0.015465439 0.004888586 1286 3.164 0.0045  
##   
## Results are averaged over the levels of: Condition\_period, Shift   
## P value adjustment: tukey method for comparing a family of 3 estimates   
##   
##   
##   
## [[9]][[2]][[2]]  
## [[9]][[2]][[2]][[1]]  
## [1] "Condition\_period"  
##   
## [[9]][[2]][[2]][[2]]  
## $lsmeans  
## Condition\_period lsmean SE df lower.CL upper.CL  
## b\_b 0.6776176 0.02440429 36 0.6281234 0.7271118  
## b\_i 0.6703507 0.02521601 36 0.6192102 0.7214911  
## r\_b 0.7008370 0.02458534 36 0.6509756 0.7506984  
## r\_i 0.6720143 0.02477305 36 0.6217722 0.7222564  
## w\_b 0.6976651 0.02433430 36 0.6483128 0.7470173  
## w\_i 0.6720768 0.02431445 36 0.6227648 0.7213888  
##   
## Results are averaged over the levels of: TimeBin, Shift   
## Confidence level used: 0.95   
##   
## $contrasts  
## contrast estimate SE df t.ratio p.value  
## b\_b - b\_i 7.266916e-03 0.01515883 124 0.479 0.9968  
## b\_b - r\_b -2.321939e-02 0.01436535 124 -1.616 0.5894  
## b\_b - r\_i 5.603299e-03 0.01463869 124 0.383 0.9989  
## b\_b - w\_b -2.004749e-02 0.01407370 124 -1.424 0.7121  
## b\_b - w\_i 5.540820e-03 0.01401665 124 0.395 0.9987  
## b\_i - r\_b -3.048631e-02 0.01577555 124 -1.933 0.3875  
## b\_i - r\_i -1.663617e-03 0.01586191 124 -0.105 1.0000  
## b\_i - w\_b -2.731440e-02 0.01554873 124 -1.757 0.4974  
## b\_i - w\_i -1.726096e-03 0.01544827 124 -0.112 1.0000  
## r\_b - r\_i 2.882269e-02 0.01442723 124 1.998 0.3495  
## r\_b - w\_b 3.171908e-03 0.01434792 124 0.221 0.9999  
## r\_b - w\_i 2.876021e-02 0.01429491 124 2.012 0.3416  
## r\_i - w\_b -2.565078e-02 0.01455309 124 -1.763 0.4936  
## r\_i - w\_i -6.247894e-05 0.01450623 124 -0.004 1.0000  
## w\_b - w\_i 2.558831e-02 0.01322914 124 1.934 0.3865  
##   
## Results are averaged over the levels of: TimeBin, Shift   
## P value adjustment: tukey method for comparing a family of 6 estimates   
##   
##   
##   
##   
##   
## [[10]]  
## [[10]][[1]]  
## [[10]][[1]][[1]]  
## [1] "PVT correct"  
##   
## [[10]][[1]][[2]]  
## R2m R2c   
## 0.03589963 0.20497905   
##   
## [[10]][[1]][[3]]  
## numDF denDF F.value p.value  
## (Intercept) 1 1636 6.675444e+04 0.000000000  
## Condition\_period 5 142 2.774884e+00 0.020099335  
## TimeBin 2 1636 5.137578e+00 0.005966994  
## Shift 1 39 7.435333e-01 0.393802770  
## Condition\_period:TimeBin 10 1636 5.348815e-01 0.866375186  
## Condition\_period:Shift 5 142 1.381525e+00 0.234723597  
## TimeBin:Shift 2 1636 1.674489e+00 0.187724858  
## Condition\_period:TimeBin:Shift 10 1636 2.220597e+00 0.014551712  
##   
##   
## [[10]][[2]]  
## [[10]][[2]][[1]]  
## [[10]][[2]][[1]][[1]]  
## [1] "TimeBin"  
##   
## [[10]][[2]][[1]][[2]]  
## $lsmeans  
## TimeBin lsmean SE df lower.CL upper.CL  
## 1 0.9645733 0.004440169 39 0.9555922 0.9735544  
## 2 0.9606351 0.004419203 39 0.9516965 0.9695738  
## 3 0.9553435 0.004350708 39 0.9465434 0.9641437  
##   
## Results are averaged over the levels of: Condition\_period, Shift   
## Confidence level used: 0.95   
##   
## $contrasts  
## contrast estimate SE df t.ratio p.value  
## 1 - 2 0.003938191 0.003405170 1636 1.157 0.4795  
## 1 - 3 0.009229802 0.003311204 1636 2.787 0.0148  
## 2 - 3 0.005291612 0.003290360 1636 1.608 0.2424  
##   
## Results are averaged over the levels of: Condition\_period, Shift   
## P value adjustment: tukey method for comparing a family of 3 estimates   
##   
##   
##   
## [[10]][[2]][[2]]  
## [[10]][[2]][[2]][[1]]  
## [1] "Condition\_period"  
##   
## [[10]][[2]][[2]][[2]]  
## $lsmeans  
## Condition\_period lsmean SE df lower.CL upper.CL  
## b\_b 0.9612341 0.005567848 39 0.9499720 0.9724961  
## b\_i 0.9465512 0.005901736 39 0.9346138 0.9584886  
## r\_b 0.9711444 0.005790058 39 0.9594329 0.9828559  
## r\_i 0.9549566 0.005668586 39 0.9434908 0.9664224  
## w\_b 0.9654617 0.005314224 39 0.9547126 0.9762107  
## w\_i 0.9617560 0.005282108 39 0.9510719 0.9724401  
##   
## Results are averaged over the levels of: TimeBin, Shift   
## Confidence level used: 0.95   
##   
## $contrasts  
## contrast estimate SE df t.ratio p.value  
## b\_b - b\_i 0.0146828669 0.006299598 142 2.331 0.1888  
## b\_b - r\_b -0.0099103509 0.006228974 142 -1.591 0.6058  
## b\_b - r\_i 0.0062774194 0.006107270 142 1.028 0.9079  
## b\_b - w\_b -0.0042276025 0.005882292 142 -0.719 0.9794  
## b\_b - w\_i -0.0005219505 0.005851916 142 -0.089 1.0000  
## b\_i - r\_b -0.0245932178 0.006545068 142 -3.758 0.0034  
## b\_i - r\_i -0.0084054475 0.006413582 142 -1.311 0.7788  
## b\_i - w\_b -0.0189104694 0.006268811 142 -3.017 0.0352  
## b\_i - w\_i -0.0152048174 0.006225278 142 -2.442 0.1489  
## r\_b - r\_i 0.0161877703 0.006181609 142 2.619 0.0994  
## r\_b - w\_b 0.0056827484 0.006116802 142 0.929 0.9384  
## r\_b - w\_i 0.0093884004 0.006080939 142 1.544 0.6366  
## r\_i - w\_b -0.0105050219 0.005994832 142 -1.752 0.4998  
## r\_i - w\_i -0.0067993699 0.005963829 142 -1.140 0.8638  
## w\_b - w\_i 0.0037056520 0.005521316 142 0.671 0.9848  
##   
## Results are averaged over the levels of: TimeBin, Shift   
## P value adjustment: tukey method for comparing a family of 6 estimates   
##   
##   
##   
##   
##   
## [[11]]  
## [[11]][[1]]  
## [[11]][[1]][[1]]  
## [1] "PVT mean response time"  
##   
## [[11]][[1]][[2]]  
## R2m R2c   
## 0.05603951 0.56665988   
##   
## [[11]][[1]][[3]]  
## numDF denDF F.value p.value  
## (Intercept) 1 1636 1866.1457501 0.000000e+00  
## Condition\_period 5 142 1.7749777 1.217026e-01  
## TimeBin 2 1636 24.6012796 2.973810e-11  
## Shift 1 39 2.5774560 1.164639e-01  
## Condition\_period:TimeBin 10 1636 0.7512929 6.761870e-01  
## Condition\_period:Shift 5 142 0.7176482 6.111898e-01  
## TimeBin:Shift 2 1636 1.9904554 1.369639e-01  
## Condition\_period:TimeBin:Shift 10 1636 1.0673510 3.842203e-01  
##   
##   
## [[11]][[2]]  
## [[11]][[2]][[1]]  
## [1] "TimeBin"  
##   
## [[11]][[2]][[2]]  
## $lsmeans  
## TimeBin lsmean SE df lower.CL upper.CL  
## 1 0.4291198 0.01102303 39 0.4068237 0.4514160  
## 2 0.4458582 0.01101004 39 0.4235883 0.4681281  
## 3 0.4572112 0.01097365 39 0.4350149 0.4794075  
##   
## Results are averaged over the levels of: Condition\_period, Shift   
## Confidence level used: 0.95   
##   
## $contrasts  
## contrast estimate SE df t.ratio p.value  
## 1 - 2 -0.01673835 0.004035349 1636 -4.148 0.0001  
## 1 - 3 -0.02809138 0.003924666 1636 -7.158 <.0001  
## 2 - 3 -0.01135302 0.003894615 1636 -2.915 0.0101  
##   
## Results are averaged over the levels of: Condition\_period, Shift   
## P value adjustment: tukey method for comparing a family of 3 estimates   
##   
##   
##   
##   
## [[12]]  
## [[12]][[1]]  
## [[12]][[1]][[1]]  
## [1] "PVT median response time"  
##   
## [[12]][[1]][[2]]  
## R2m R2c   
## 0.06032291 0.67350176   
##   
## [[12]][[1]][[3]]  
## numDF denDF F.value p.value  
## (Intercept) 1 1636 2539.7534044 0.000000000  
## Condition\_period 5 142 1.7240879 0.132806190  
## TimeBin 2 1636 46.7050608 0.000000000  
## Shift 1 39 2.2323318 0.143197283  
## Condition\_period:TimeBin 10 1636 0.6931081 0.731723272  
## Condition\_period:Shift 5 142 0.2194775 0.953690162  
## TimeBin:Shift 2 1636 4.6209255 0.009972515  
## Condition\_period:TimeBin:Shift 10 1636 1.2308197 0.265984686  
##   
##   
## [[12]][[2]]  
## [[12]][[2]][[1]]  
## [[12]][[2]][[1]][[1]]  
## [1] "TimeBin"  
##   
## [[12]][[2]][[1]][[2]]  
## $lsmeans  
## TimeBin lsmean SE df lower.CL upper.CL  
## 1 0.3996151 0.008724185 39 0.3819688 0.4172614  
## 2 0.4161635 0.008717755 39 0.3985302 0.4337968  
## 3 0.4236551 0.008699895 39 0.4060579 0.4412523  
##   
## Results are averaged over the levels of: Condition\_period, Shift   
## Confidence level used: 0.95   
##   
## $contrasts  
## contrast estimate SE df t.ratio p.value  
## 1 - 2 -0.016548420 0.002526350 1636 -6.550 <.0001  
## 1 - 3 -0.024039975 0.002457128 1636 -9.784 <.0001  
## 2 - 3 -0.007491555 0.002437725 1636 -3.073 0.0061  
##   
## Results are averaged over the levels of: Condition\_period, Shift   
## P value adjustment: tukey method for comparing a family of 3 estimates   
##   
##   
##   
## [[12]][[2]][[2]]  
## [[12]][[2]][[2]][[1]]  
## [1] "TimeBin:Shift"  
##   
## [[12]][[2]][[2]][[2]]  
## $lsmeans  
## Shift = day:  
## TimeBin lsmean SE df lower.CL upper.CL  
## 1 0.3908294 0.01013380 40 0.3703483 0.4113106  
## 2 0.4032380 0.01015292 40 0.3827182 0.4237578  
## 3 0.4075298 0.01012578 40 0.3870649 0.4279948  
##   
## Shift = night:  
## TimeBin lsmean SE df lower.CL upper.CL  
## 1 0.4084007 0.01420393 39 0.3796706 0.4371309  
## 2 0.4290890 0.01417446 39 0.4004185 0.4577595  
## 3 0.4397803 0.01414996 39 0.4111593 0.4684013  
##   
## Results are averaged over the levels of: Condition\_period   
## Confidence level used: 0.95   
##   
## $contrasts  
## Shift = day:  
## contrast estimate SE df t.ratio p.value  
## 1 - 2 -0.012408567 0.002863827 1636 -4.333 <.0001  
## 1 - 3 -0.016700378 0.002748482 1636 -6.076 <.0001  
## 2 - 3 -0.004291811 0.002819278 1636 -1.522 0.2807  
##   
## Shift = night:  
## contrast estimate SE df t.ratio p.value  
## 1 - 2 -0.020688273 0.004162725 1636 -4.970 <.0001  
## 1 - 3 -0.031379573 0.004073789 1636 -7.703 <.0001  
## 2 - 3 -0.010691300 0.003977649 1636 -2.688 0.0199  
##   
## Results are averaged over the levels of: Condition\_period   
## P value adjustment: tukey method for comparing a family of 3 estimates