

Hypothesis Testing for NSF Office Stress Project - Full Sensor Set

Below are the test results for each of the Conditions that had $n \geq 7$ subjects. Statistical testing can have three different possible outcomes: the data is already normal (t-test), the logarithm of the data is normal (t-test with log data), or the data is NOT normal (Wilcoxon test).

For notation, let:

WB-RB = Writing Baseline - Resting Baseline

SC-RB = Stress Condition - Resting Baseline

SC-WB = Stress Condition - Writing Baseline

DT-RB = Dual Task - Resting Baseline

DT-WB = Dual Task - Writing Baseline

DT-SC = Dual Task - Stress Condition

P-RB = Presentation - Resting Baseline

P-WB = Presentation - Writing Baseline

P-SC = Presentation - Stress Condition

P-DT = Presentation - Dual Task

For each of the graphs, let:

***** = $0.01 < p \leq 0.05$

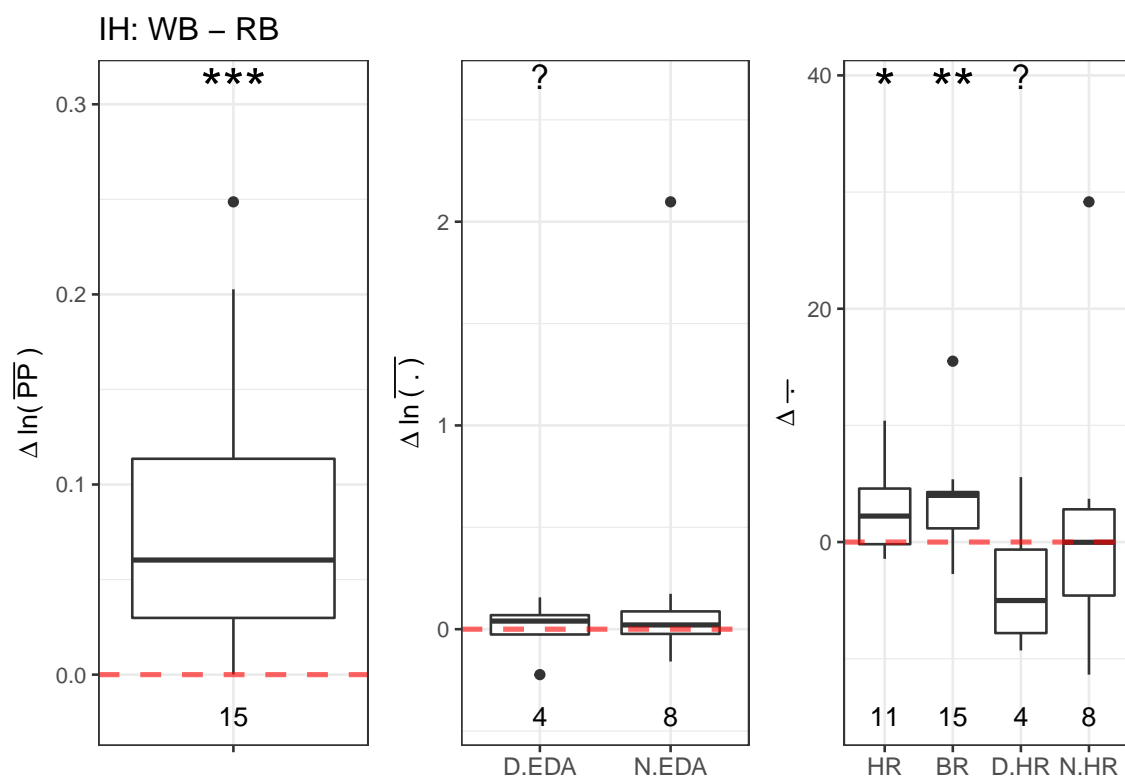
****** = $0.001 < p \leq 0.01$

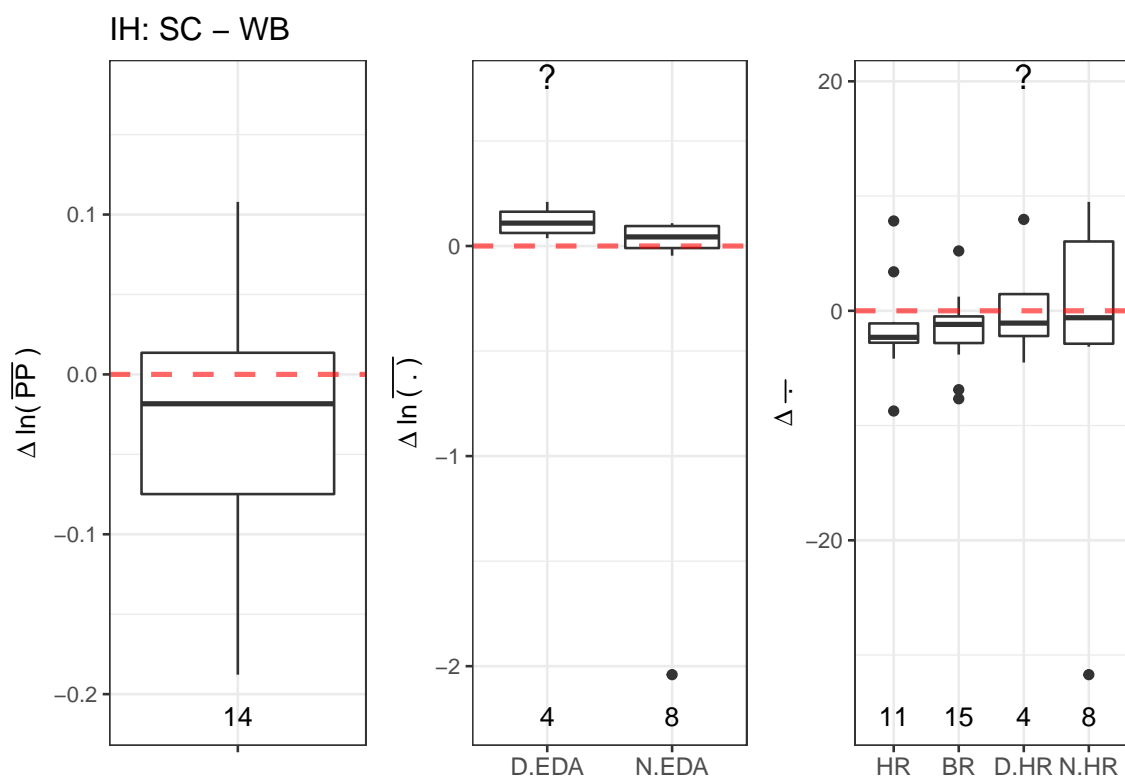
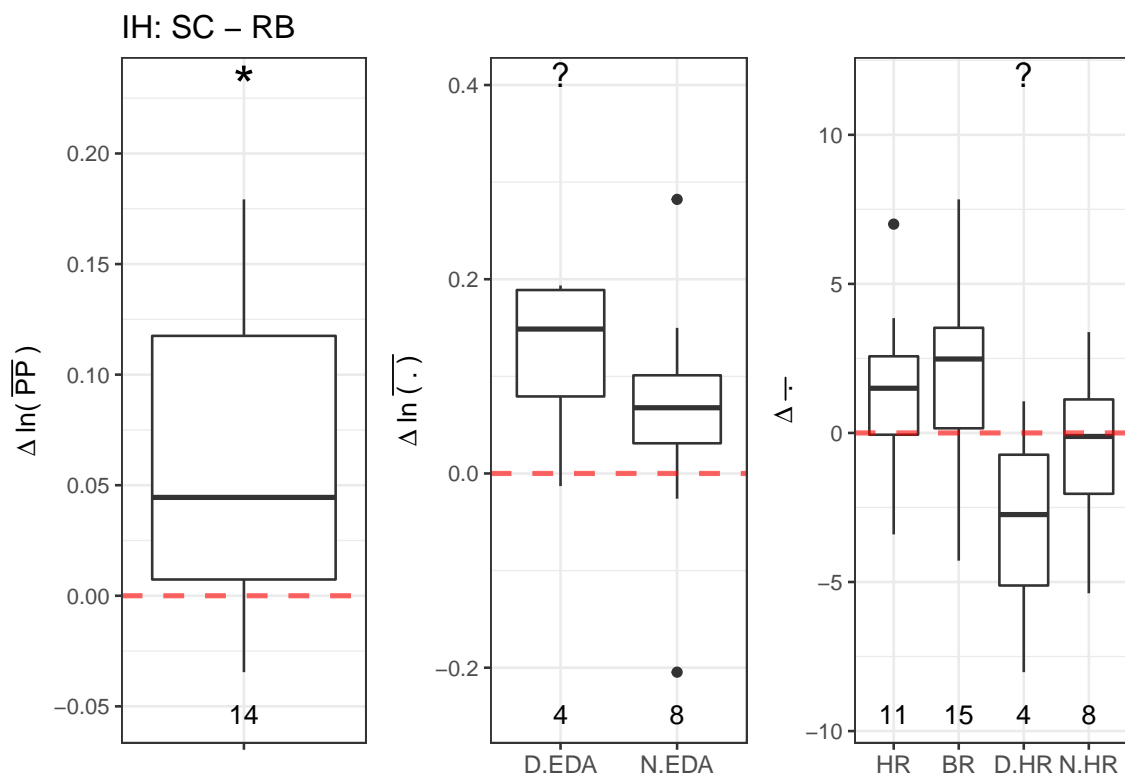
******* = $p \leq 0.001$

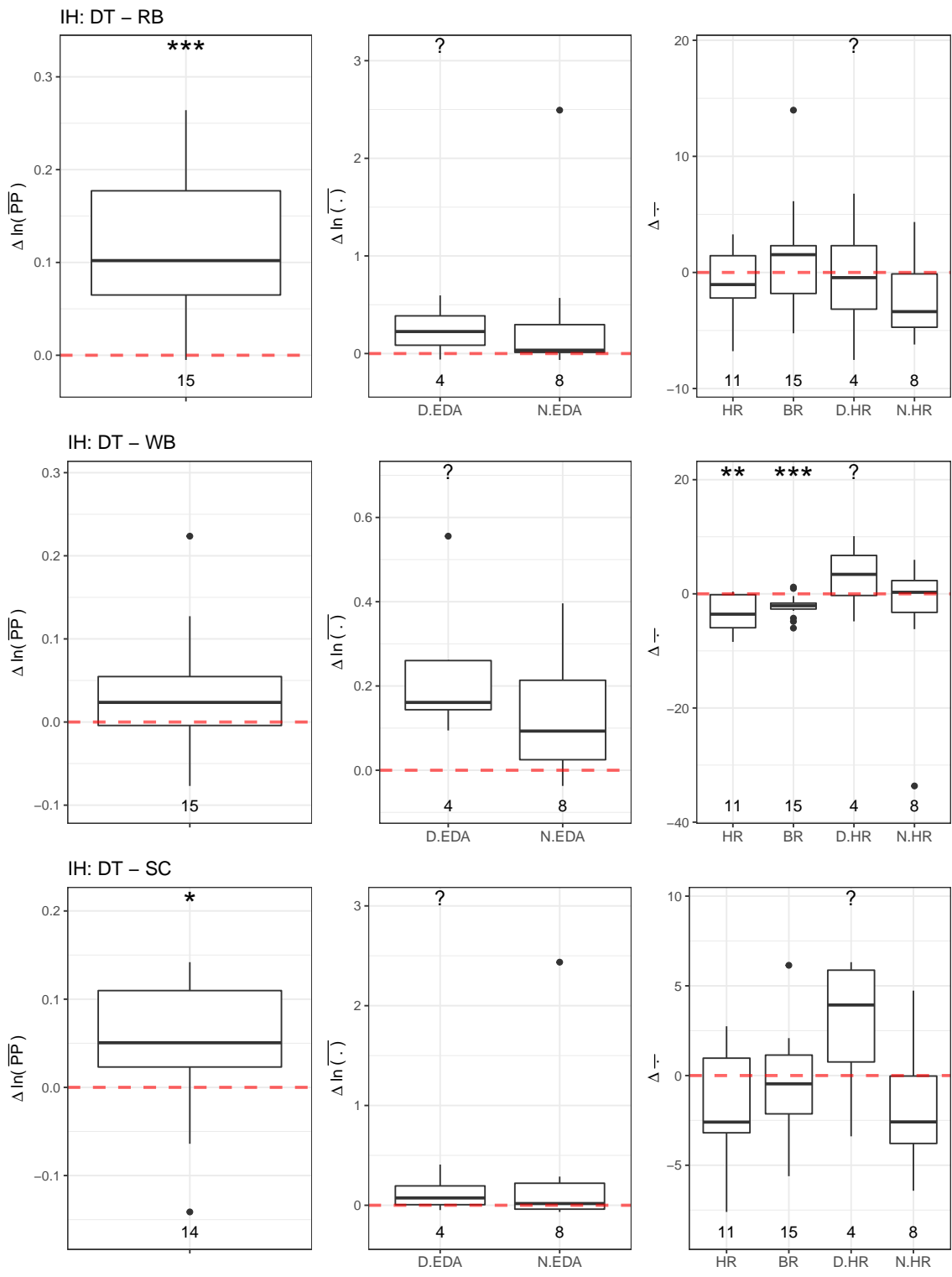
? = Did not run statistical test ($n < 7$)

Intermittent-High (IH)

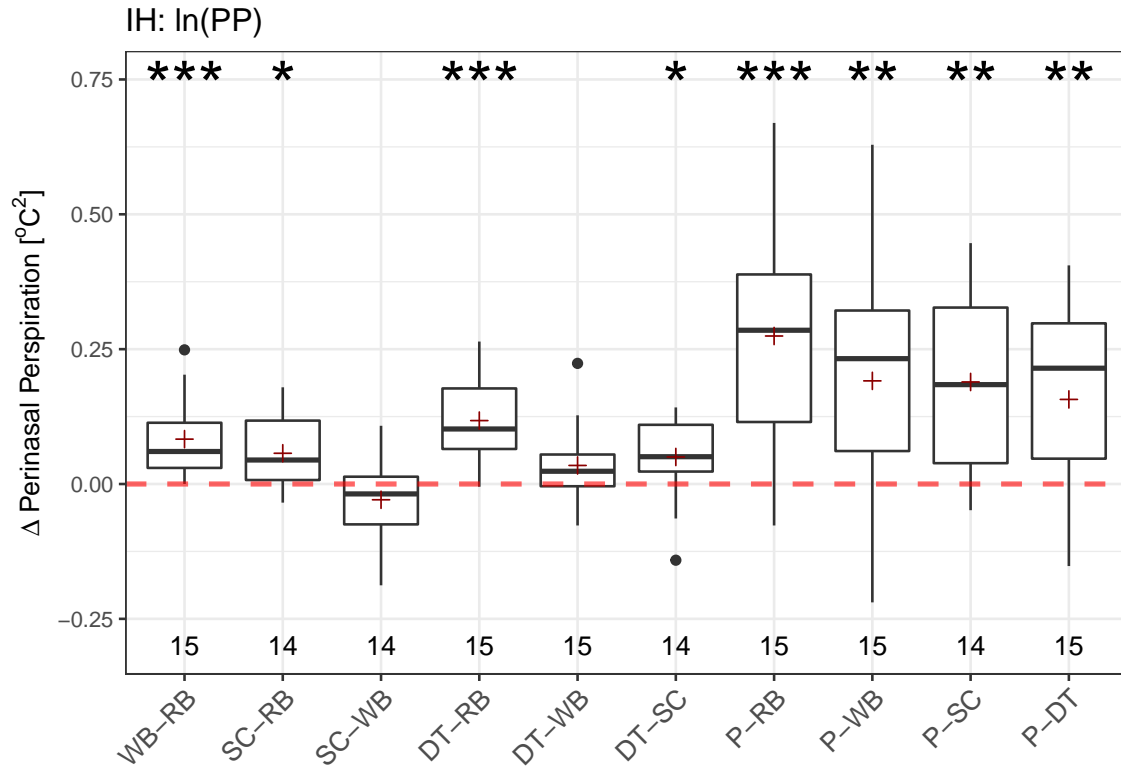
Sensor Channels per Activity





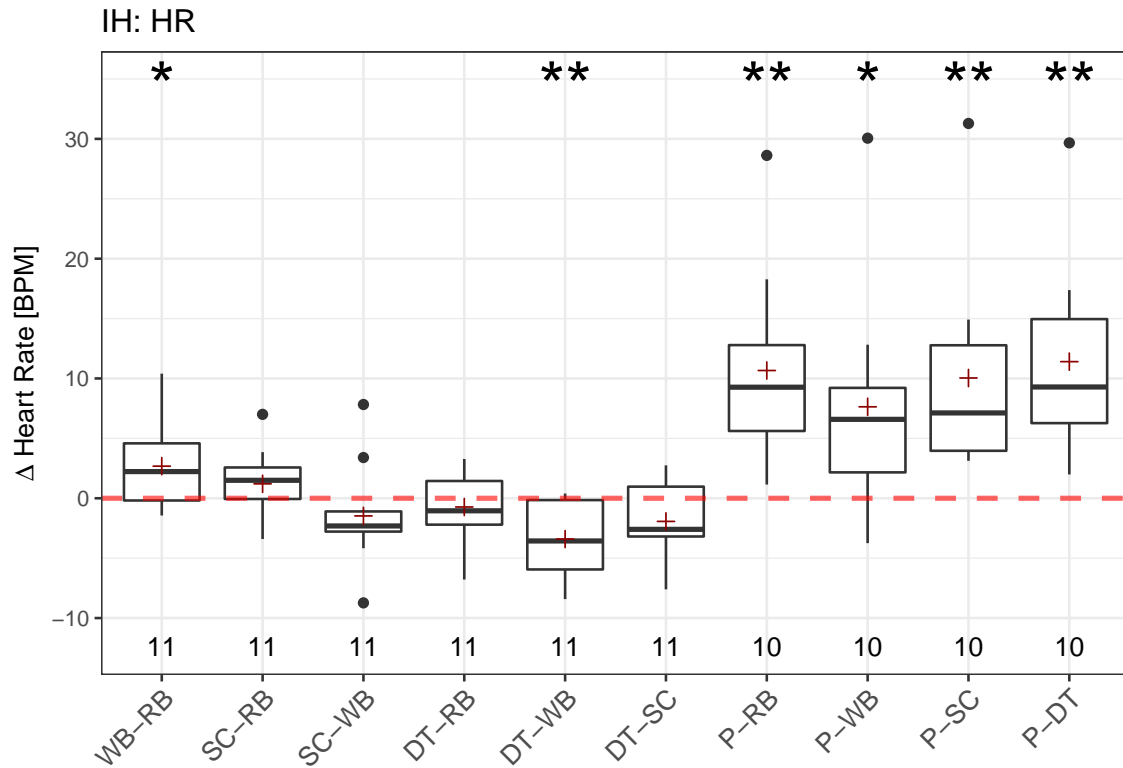


Sensor Channel across Activities



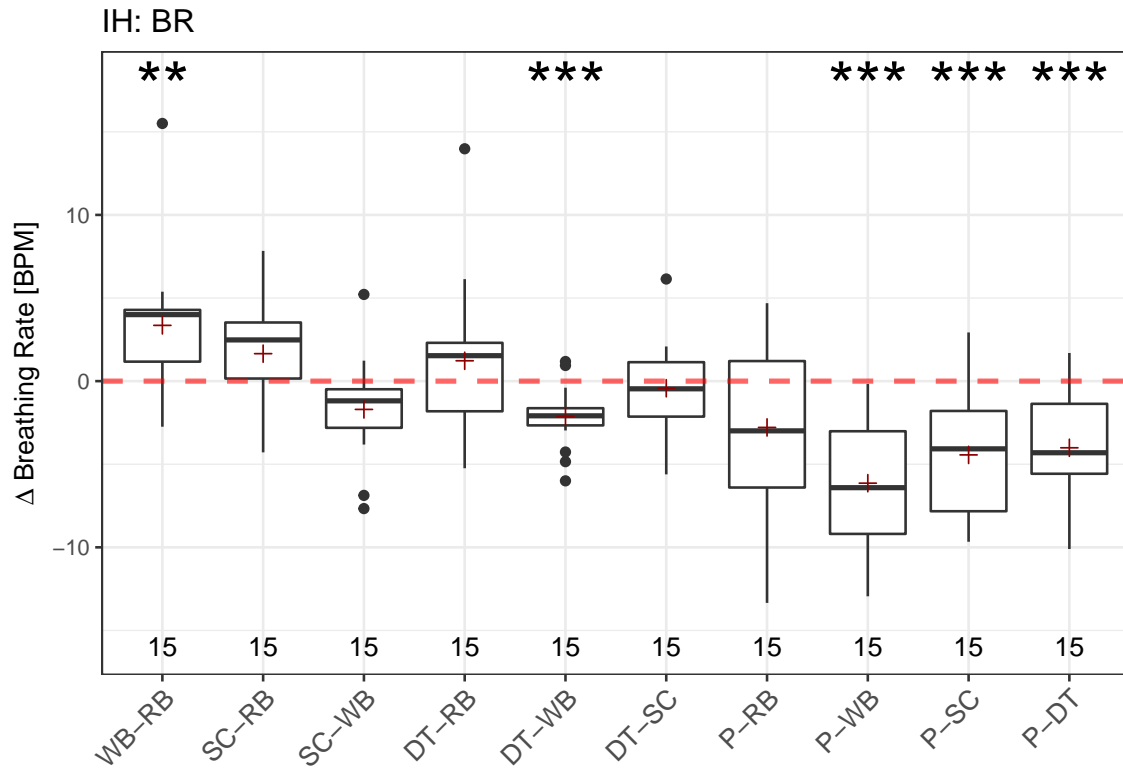
```
## In the following tests, we applied ln(PP).
##
## Writing Baseline - Resting Baseline
## Transformed t-test p = 6e-04 < 0.001 ***
##
## Stress Condition - Resting Baseline
## Transformed t-test p = 0.0118 < 0.05 *
##
## StressCondition - Writing Baseline
## Transformed t-test p = 0.1644 > 0.05
##
## Dual Task - Resting Baseline
## Transformed t-test p = 1e-04 < 0.001 ***
##
## Dual Task - Writing Baseline
## Transformed t-test p = 0.107 > 0.05
##
## Dual Task - Stress Condition
## Transformed t-test p = 0.0331 < 0.05 *
##
## Presentation - Resting Baseline
## Transformed t-test p = 2e-04 < 0.001 ***
##
```

```
## Presentation - Writing Baseline
## Transformed t-test  $p = 0.0038 < 0.01$  **
##
## Presentation - Stress Condition
## Transformed t-test  $p = 0.0011 < 0.01$  **
##
## Presentation - Dual Task
## Transformed t-test  $p = 0.0049 < 0.01$  **
```

```
## Writing Baseline - Resting Baseline
## t-test p = 0.0315 < 0.05  *
##
## Stress Condition - Resting Baseline
## t-test p = 0.2035 > 0.05
##
## StressCondition - Writing Baseline
## t-test p = 0.2709 > 0.05
##
## Dual Task - Resting Baseline
## t-test p = 0.4189 > 0.05
##
## Dual Task - Writing Baseline
## t-test p = 0.0054 < 0.01  **
##
## Dual Task - Stress Condition
## t-test p = 0.0776 > 0.05
##
## Presentation - Resting Baseline
## t-test p = 0.0024 < 0.01  **
##
## Presentation - Writing Baseline
## t-test p = 0.0278 < 0.05  *
##
## Presentation - Stress Condition
```

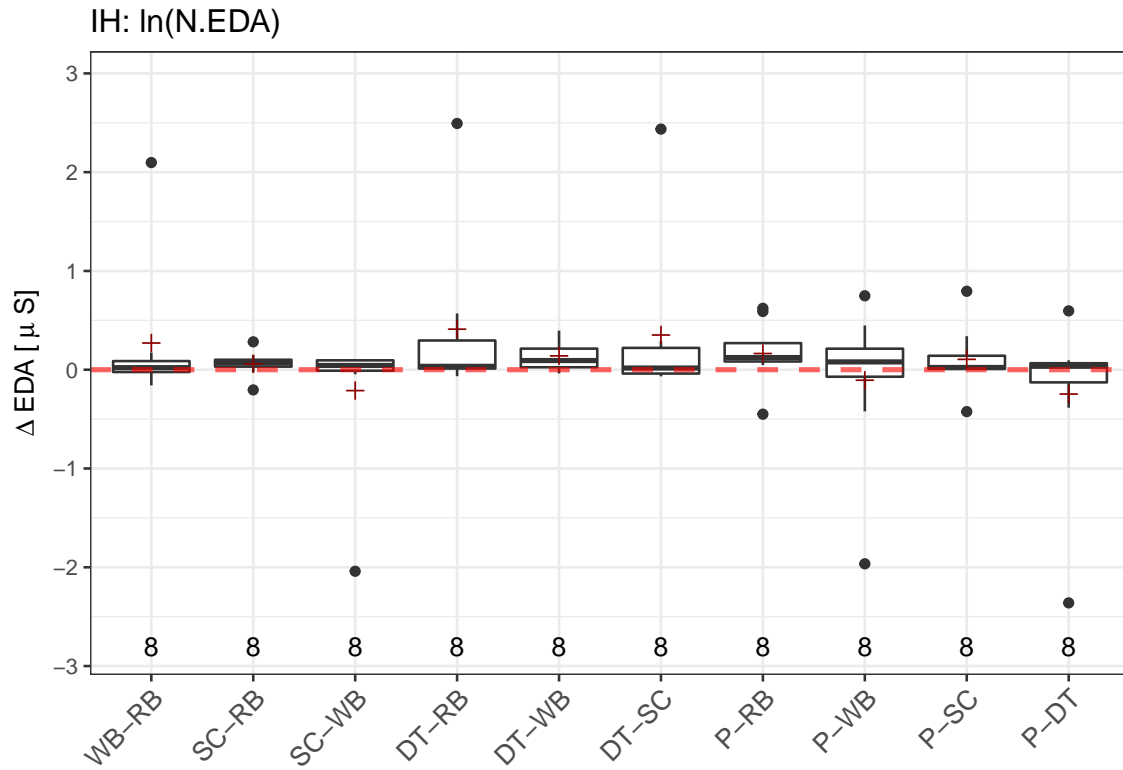
```
## t-test p = 0.0051 < 0.01 **  
##  
## Presentation - Dual Task  
## t-test p = 0.0015 < 0.01 **
```



```
## Writing Baseline - Resting Baseline
## t-test p = 0.0083 < 0.01  **
##
## Stress Condition - Resting Baseline
## t-test p = 0.0916 > 0.05
##
## StressCondition - Writing Baseline
## t-test p = 0.0506 > 0.05
##
## Dual Task - Resting Baseline
## t-test p = 0.3327 > 0.05
##
## Dual Task - Writing Baseline
## t-test p = 7e-04 < 0.001  ***
##
## Dual Task - Stress Condition
## t-test p = 0.5657 > 0.05
##
## Presentation - Resting Baseline
## t-test p = 0.0545 > 0.05
##
## Presentation - Writing Baseline
## t-test p = 0 < 0.001  ***
##
## Presentation - Stress Condition
```

```
## t-test p = 8e-04 < 0.001 ***  
##  
## Presentation - Dual Task  
## t-test p = 5e-04 < 0.001 ***
```

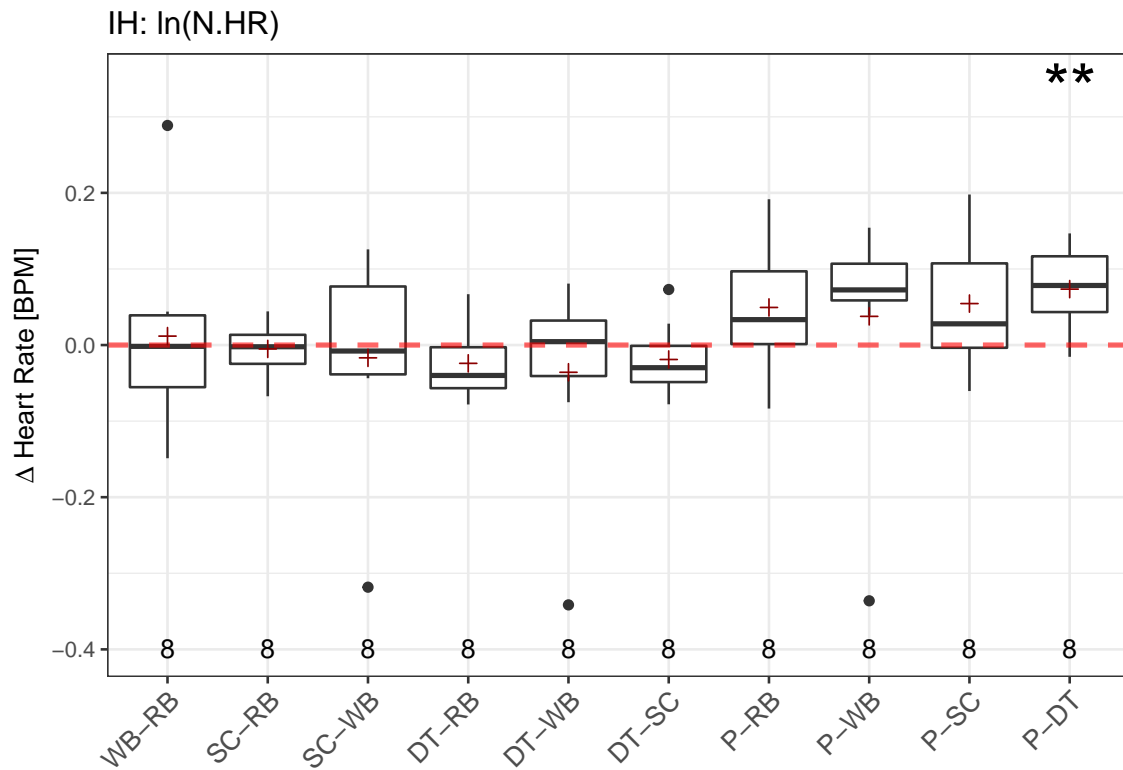
```
## IH has LESS than 7 subjects for D.EDA. Cannot continue with test.  
## -----
```



```
## In the following tests, we applied ln(N.EDA).
##
## Writing Baseline - Resting Baseline
## Transformed t-test p = 0.3383 > 0.05
##
## Stress Condition - Resting Baseline
## Transformed t-test p = 0.2703 > 0.05
##
## StressCondition - Writing Baseline
## Transformed t-test p = 0.4462 > 0.05
##
## Dual Task - Resting Baseline
## Transformed t-test p = 0.2217 > 0.05
##
## Dual Task - Writing Baseline
## Transformed t-test p = 0.0542 > 0.05
##
## Dual Task - Stress Condition
## Transformed t-test p = 0.2815 > 0.05
##
## Presentation - Resting Baseline
## Transformed t-test p = 0.2098 > 0.05
##
## Presentation - Writing Baseline
## Transformed t-test p = 0.7255 > 0.05
```

```
##
## Presentation - Stress Condition
## Transformed t-test p = 0.4209 > 0.05
##
## Presentation - Dual Task
## Transformed t-test p = 0.4616 > 0.05
```

```
## IH has LESS than 7 subjects for D.HR. Cannot continue with test.
## -----
```

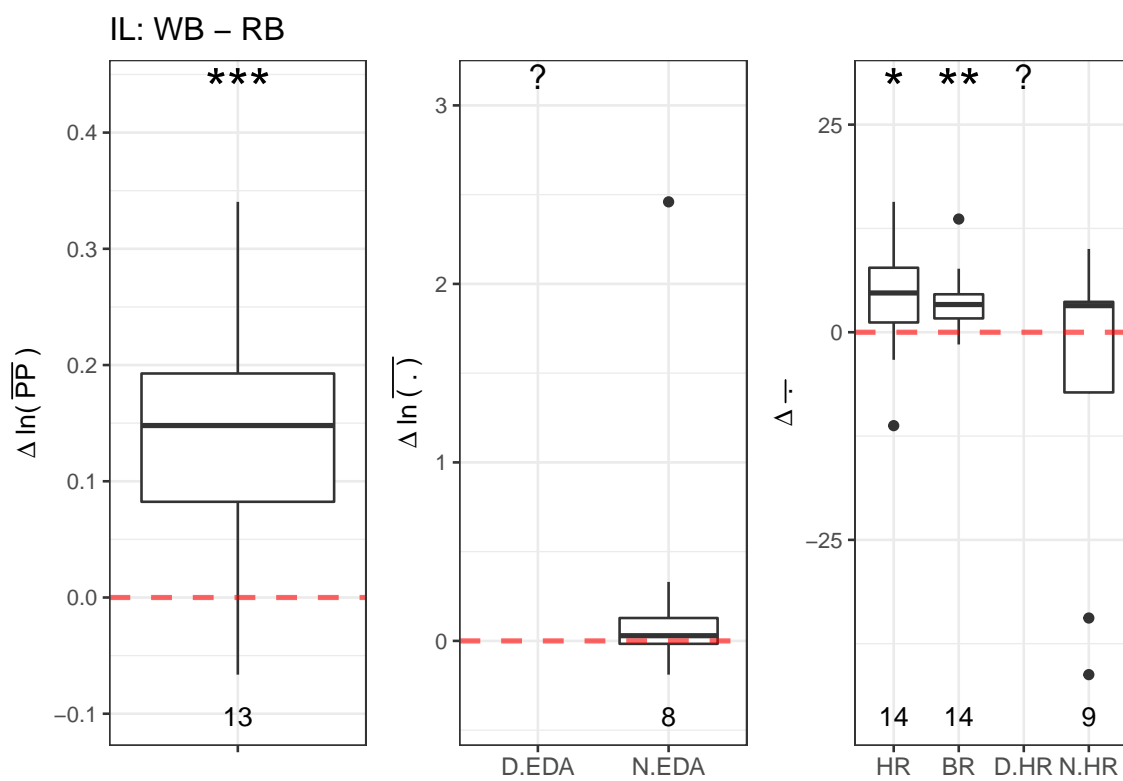


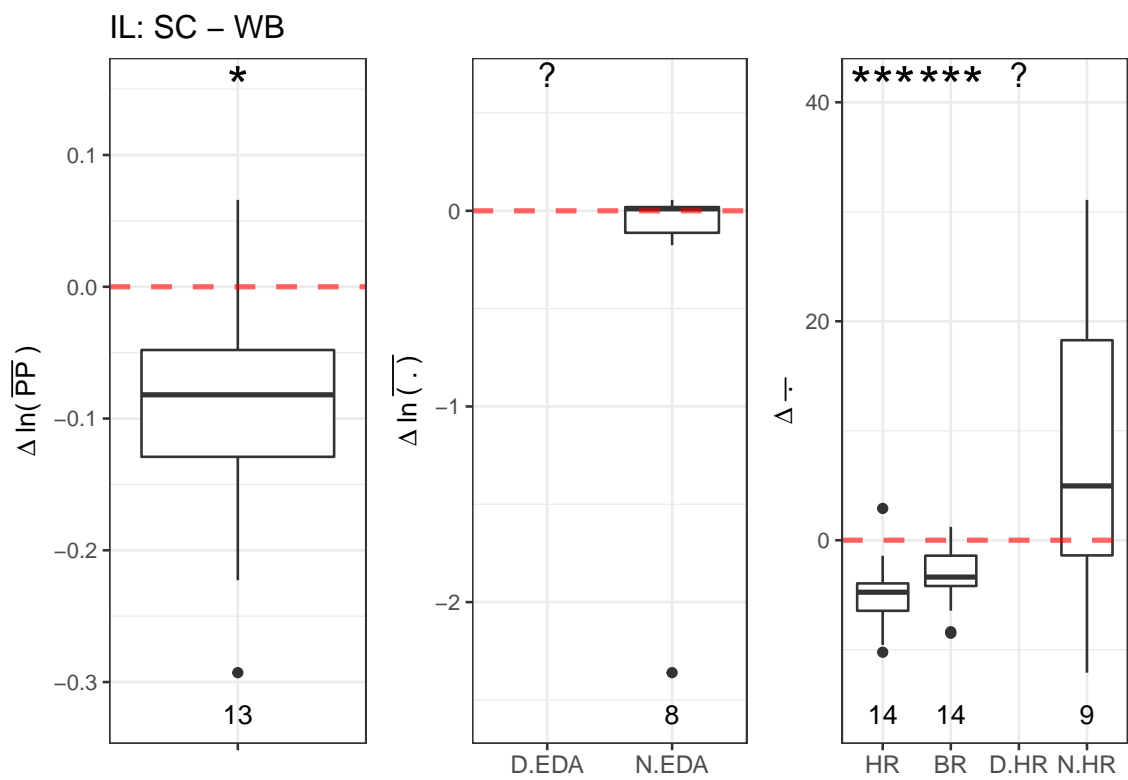
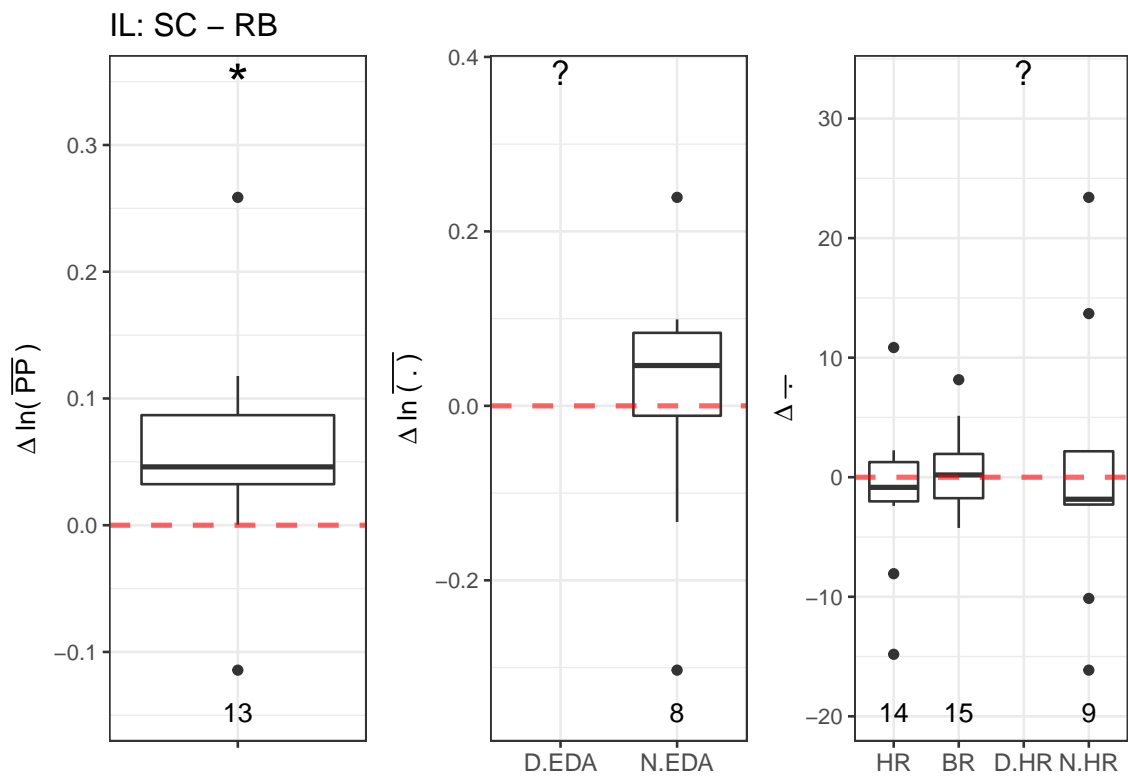
```
## Writing Baseline - Resting Baseline
## Transformed t-test p = 0.8056 > 0.05
##
## Stress Condition - Resting Baseline
## Transformed t-test p = 0.6971 > 0.05
##
## StressCondition - Writing Baseline
## Transformed t-test p = 0.7377 > 0.05
##
## Dual Task - Resting Baseline
## Transformed t-test p = 0.2221 > 0.05
##
## Dual Task - Writing Baseline
## Transformed t-test p = 0.4687 > 0.05
##
## Dual Task - Stress Condition
## Transformed t-test p = 0.3102 > 0.05
##
## Presentation - Resting Baseline
## Transformed t-test p = 0.1963 > 0.05
##
## Presentation - Writing Baseline
## Transformed t-test p = 0.5161 > 0.05
##
## Presentation - Stress Condition
```

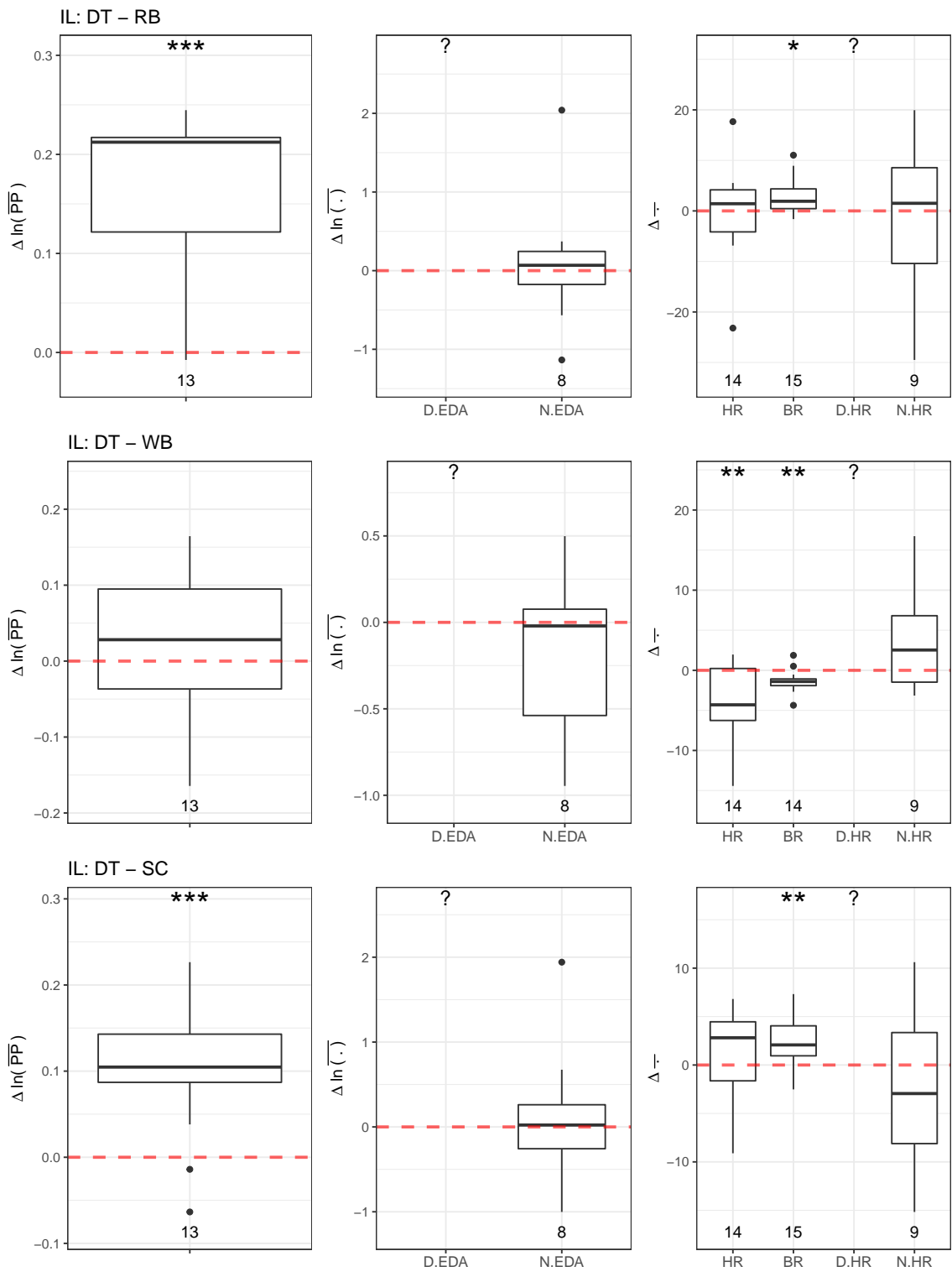
```
## Transformed t-test p = 0.1364 > 0.05
##
## Presentation - Dual Task
## Transformed t-test p = 0.0086 < 0.01  **
```

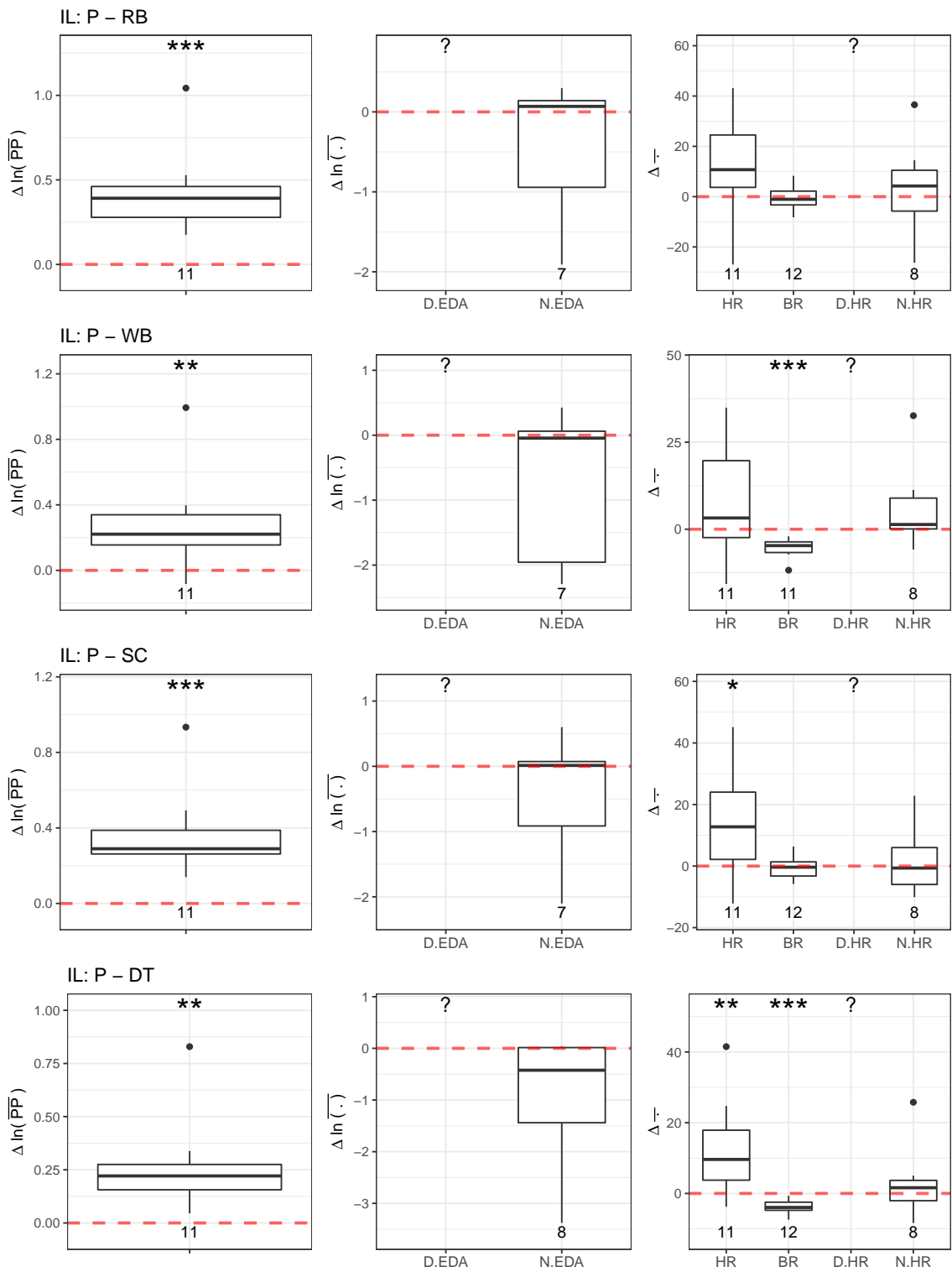

Intermittent-Low (IL)

Sensor Channels per Activity

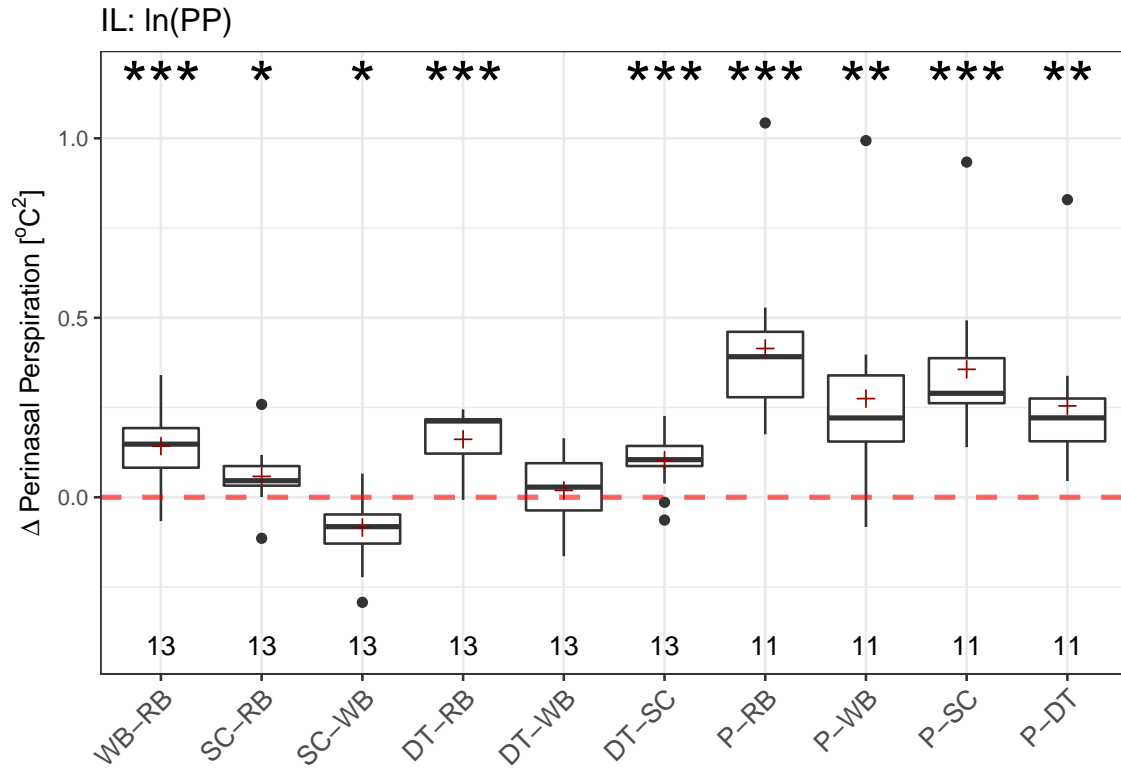






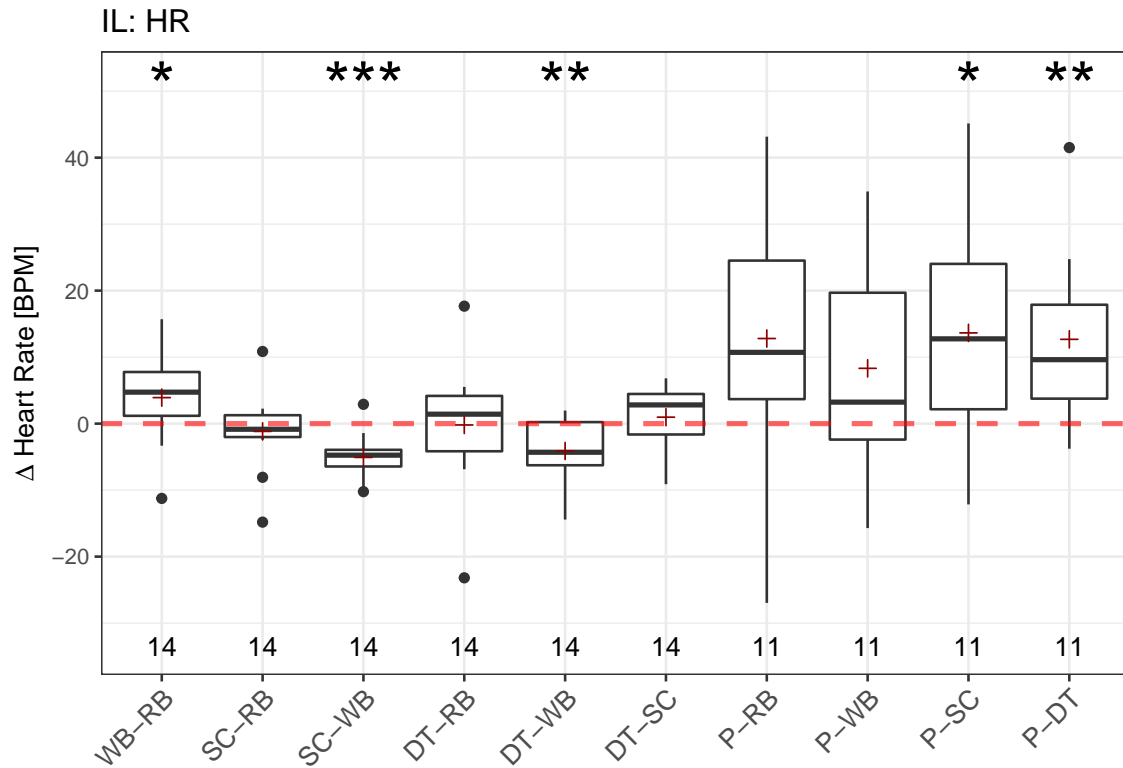


Sensor Channel across Activities



```
## Writing Baseline - Resting Baseline
## Transformed t-test p = 7e-04 < 0.001 ***
##
## Stress Condition - Resting Baseline
## Transformed t-test p = 0.0291 < 0.05 *
##
## StressCondition - Writing Baseline
## Transformed t-test p = 0.0113 < 0.05 *
##
## Dual Task - Resting Baseline
## Transformed t-test p = 0 < 0.001 ***
##
## Dual Task - Writing Baseline
## Transformed t-test p = 0.5015 > 0.05
##
## Dual Task - Stress Condition
## Transformed t-test p = 6e-04 < 0.001 ***
##
## Presentation - Resting Baseline
## Transformed t-test p = 2e-04 < 0.001 ***
##
## Presentation - Writing Baseline
## Transformed t-test p = 0.0078 < 0.01 **
```

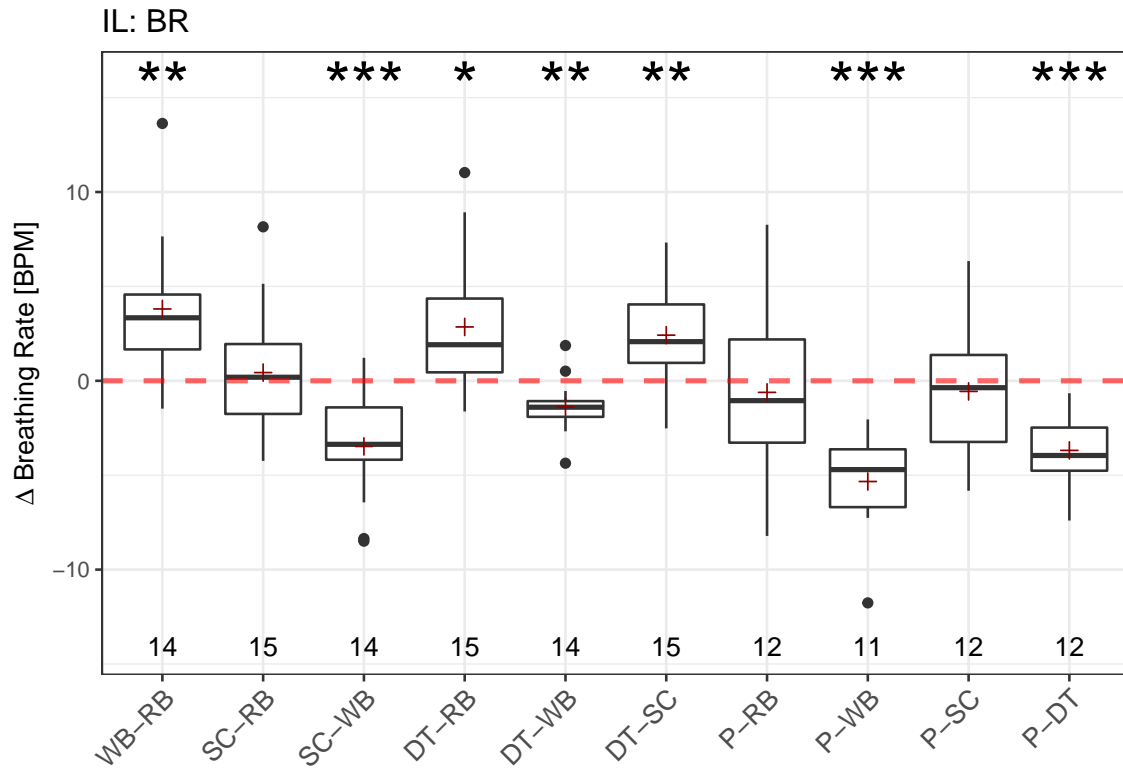
```
##  
## Presentation - Stress Condition  
## Transformed t-test  $p = 3e-04 < 0.001$  ***  
##  
## Presentation - Dual Task  
## Transformed t-test  $p = 0.0024 < 0.01$  **
```



```
## Writing Baseline - Resting Baseline
## t-test p = 0.0444 < 0.05  *
##
## Stress Condition - Resting Baseline
## t-test p = 0.4522 > 0.05
##
## StressCondition - Writing Baseline
## t-test p = 1e-04 < 0.001  ***
##
## Dual Task - Resting Baseline
## t-test p = 0.9351 > 0.05
##
## Dual Task - Writing Baseline
## t-test p = 0.0079 < 0.01  **
##
## Dual Task - Stress Condition
## t-test p = 0.4751 > 0.05
##
## Presentation - Resting Baseline
## t-test p = 0.0552 > 0.05
##
## Presentation - Writing Baseline
## t-test p = 0.0986 > 0.05
##
## Presentation - Stress Condition
```



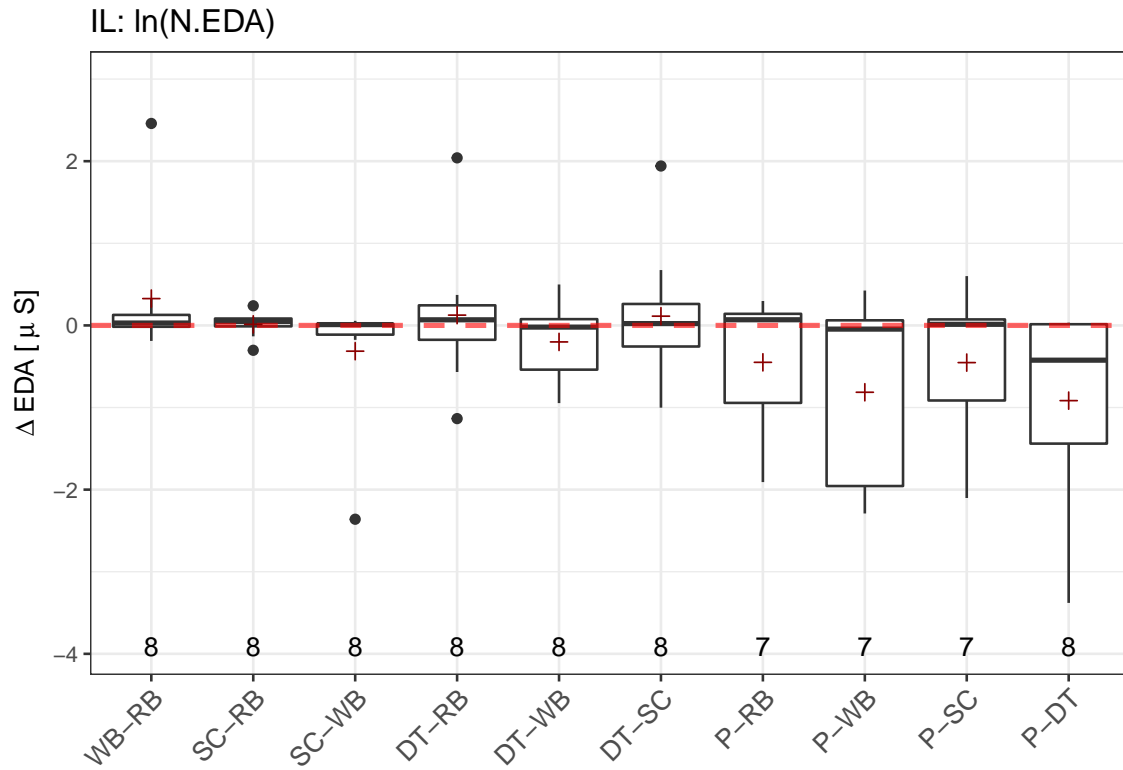
```
## t-test p = 0.0187 < 0.05  *  
##  
## Presentation - Dual Task  
## t-test p = 0.0091 < 0.01  **
```



```
## Writing Baseline - Resting Baseline
## t-test p = 0.0021 < 0.01 **
##
## Stress Condition - Resting Baseline
## t-test p = 0.6182 > 0.05
##
## StressCondition - Writing Baseline
## t-test p = 4e-04 < 0.001 ***
##
## Dual Task - Resting Baseline
## t-test p = 0.0106 < 0.05 *
##
## Dual Task - Writing Baseline
## t-test p = 0.0035 < 0.01 **
##
## Dual Task - Stress Condition
## t-test p = 0.0057 < 0.01 **
##
## Presentation - Resting Baseline
## t-test p = 0.6684 > 0.05
##
## Presentation - Writing Baseline
## t-test p = 1e-04 < 0.001 ***
##
## Presentation - Stress Condition
```

```
## t-test p = 0.6101 > 0.05
##
## Presentation - Dual Task
## t-test p = 0 < 0.001 ***
```

```
## IL has LESS than 7 subjects for D.EDA. Cannot continue with test.
## -----
```



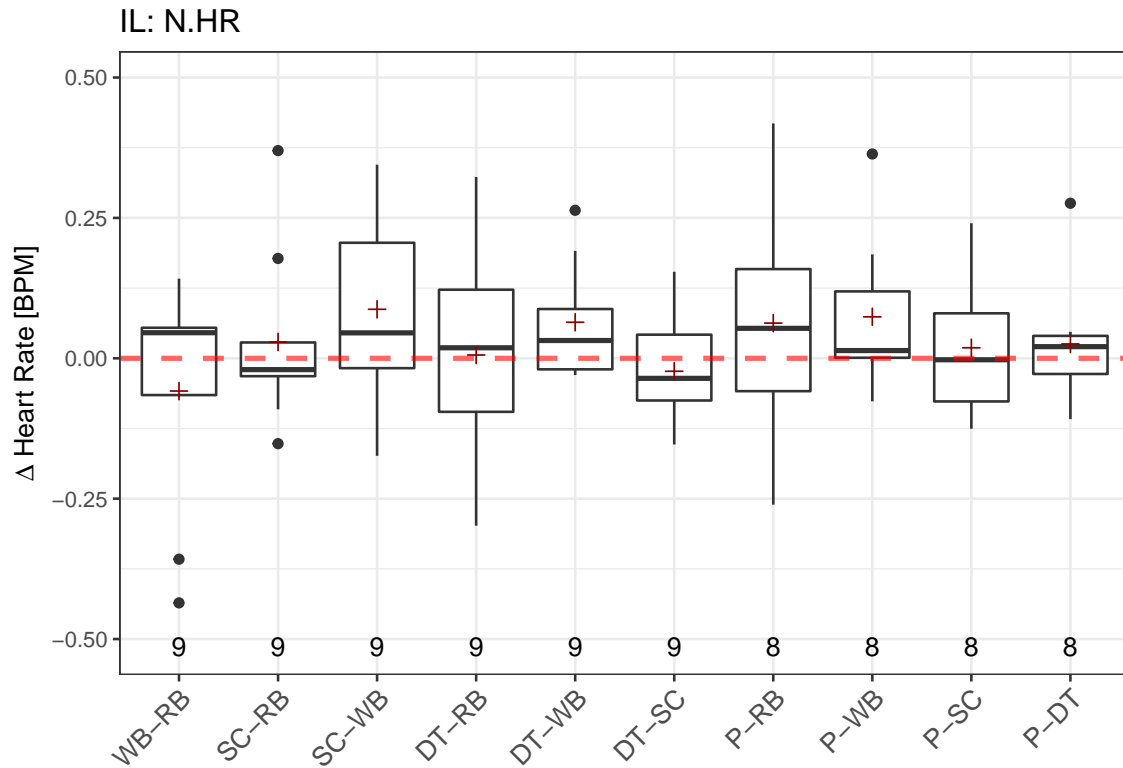
```

## Writing Baseline - Resting Baseline
## Transformed t-test p = 0.3263 > 0.05
##
## Stress Condition - Resting Baseline
## Transformed t-test p = 0.8311 > 0.05
##
## StressCondition - Writing Baseline
## Transformed t-test p = 0.3205 > 0.05
##
## Dual Task - Resting Baseline
## Transformed t-test p = 0.7091 > 0.05
##
## Dual Task - Writing Baseline
## Transformed t-test p = 0.3025 > 0.05
##
## Dual Task - Stress Condition
## Transformed t-test p = 0.7364 > 0.05
##
## Presentation - Resting Baseline
## Transformed t-test p = 0.273 > 0.05
##
## Presentation - Writing Baseline
## Transformed t-test p = 0.1214 > 0.05
##
## Presentation - Stress Condition

```

```
## Transformed t-test p = 0.2936 > 0.05
##
## Presentation - Dual Task
## Transformed t-test p = 0.0721 > 0.05
```

```
## IL has LESS than 7 subjects for D.HR. Cannot continue with test.
## -----
```

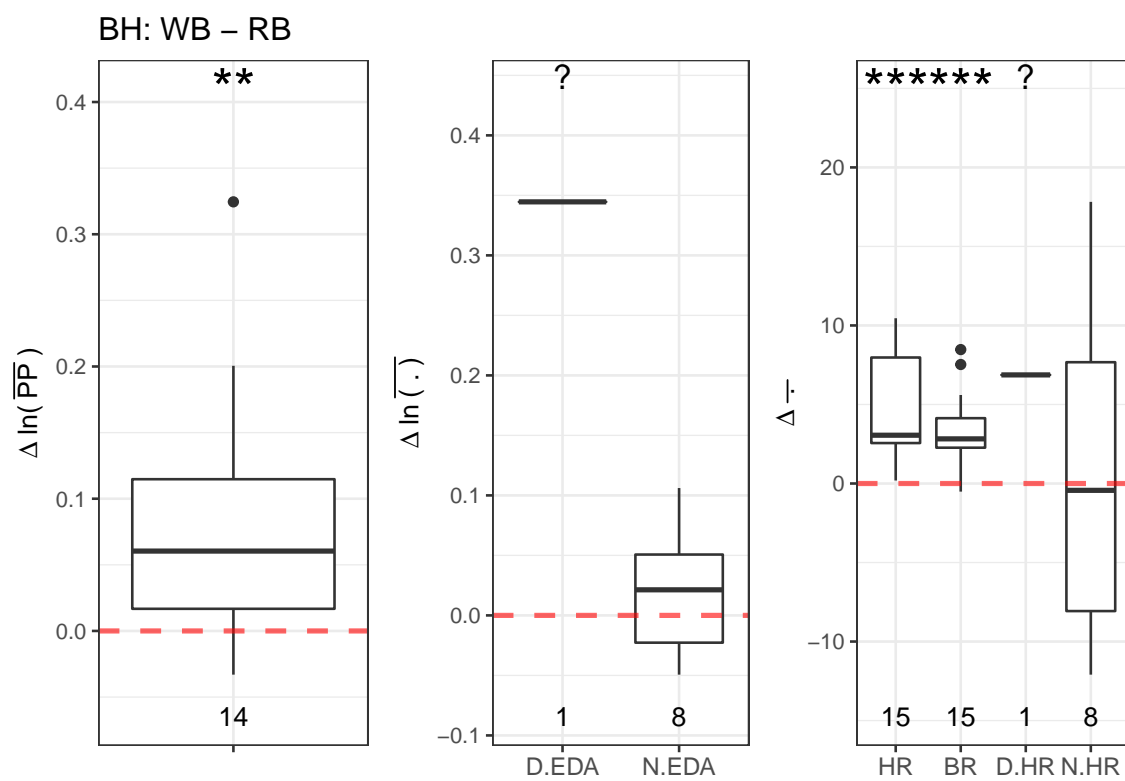


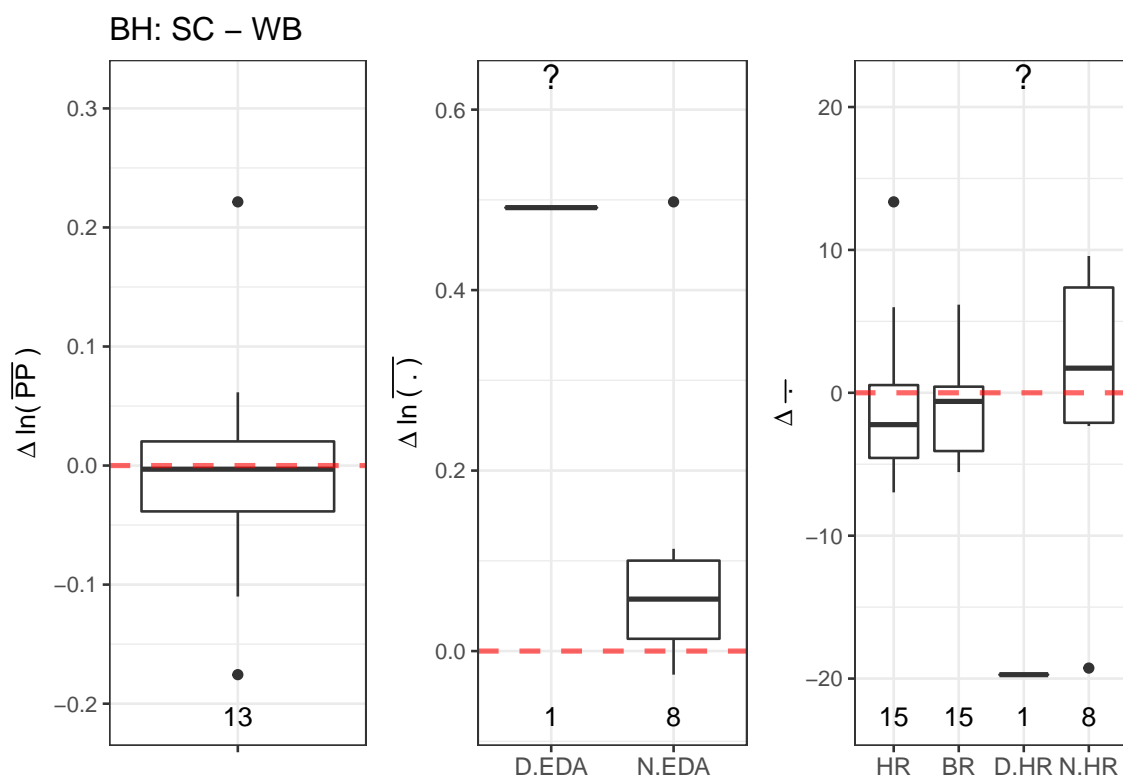
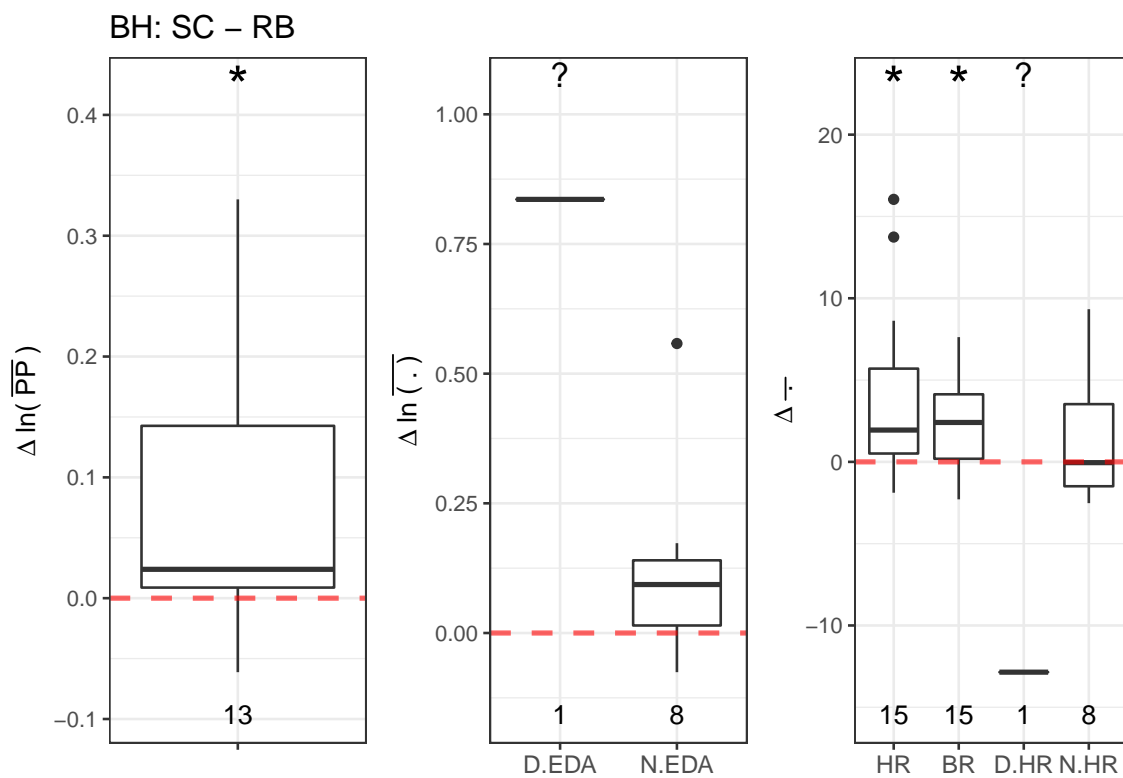
```
## Writing Baseline - Resting Baseline
## Wilcoxon p = 0.9102 > 0.05
##
## Stress Condition - Resting Baseline
## Wilcoxon p = 1 > 0.05
##
## StressCondition - Writing Baseline
## Wilcoxon p = 0.25 > 0.05
##
## Dual Task - Resting Baseline
## Wilcoxon p = 0.7344 > 0.05
##
## Dual Task - Writing Baseline
## Wilcoxon p = 0.0977 > 0.05
##
## Dual Task - Stress Condition
## Wilcoxon p = 0.5703 > 0.05
##
## Presentation - Resting Baseline
## Wilcoxon p = 0.4609 > 0.05
##
## Presentation - Writing Baseline
## Wilcoxon p = 0.1953 > 0.05
##
## Presentation - Stress Condition
```

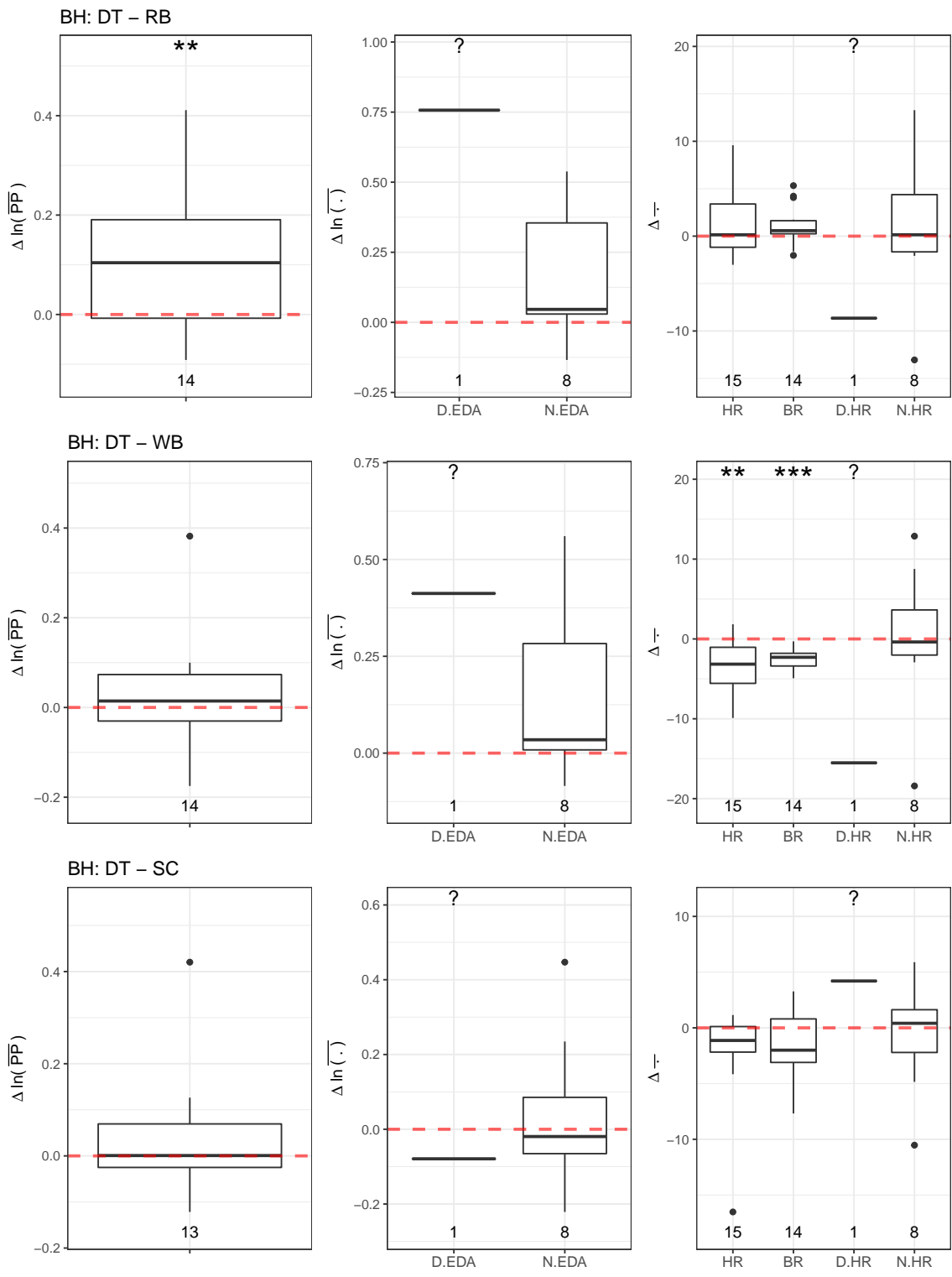
```
## Wilcoxon p = 0.9453 > 0.05
##
## Presentation - Dual Task
## Wilcoxon p = 0.7422 > 0.05
```

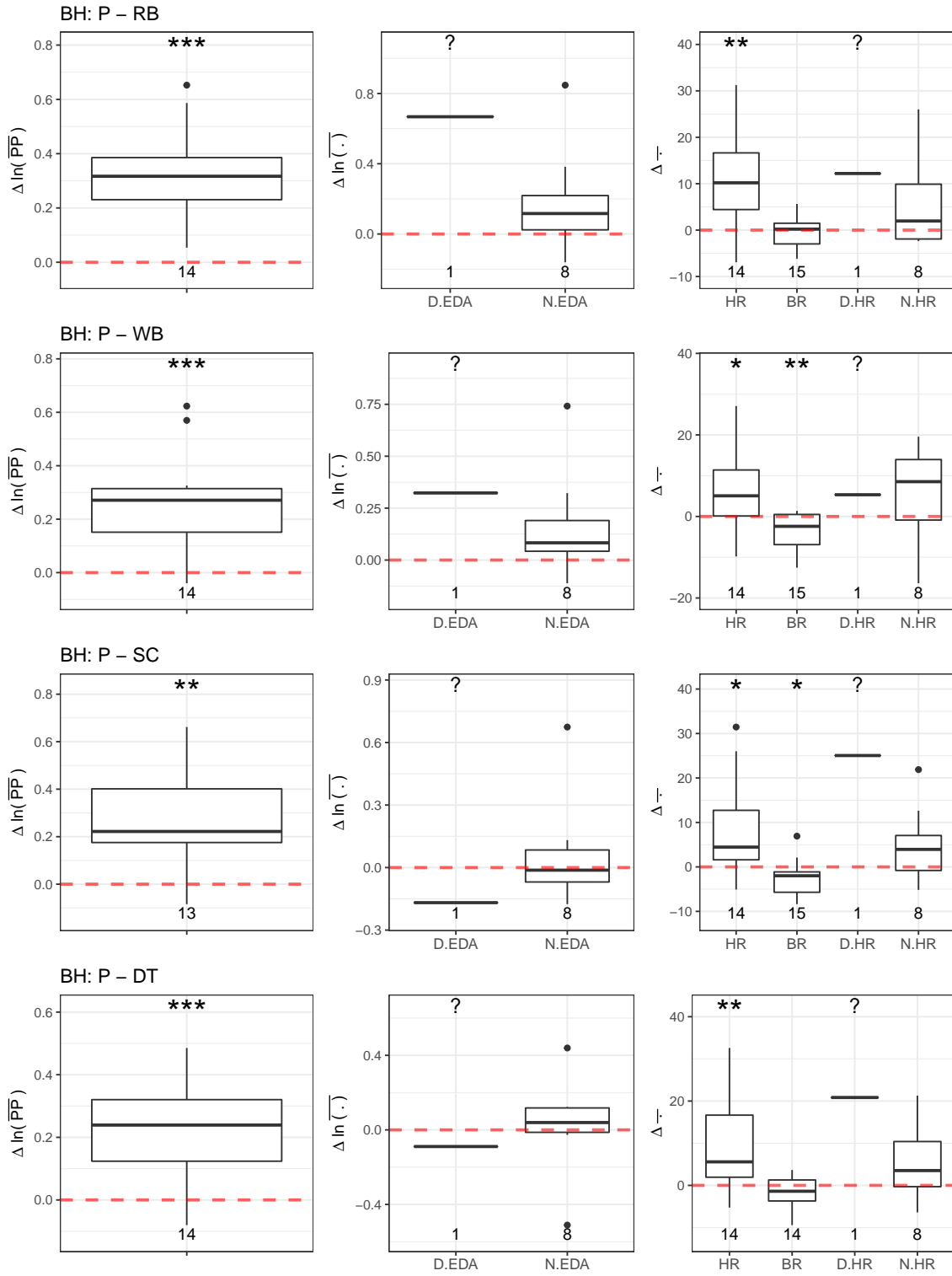
Batch-High (BH)

Sensor Channels per Activity

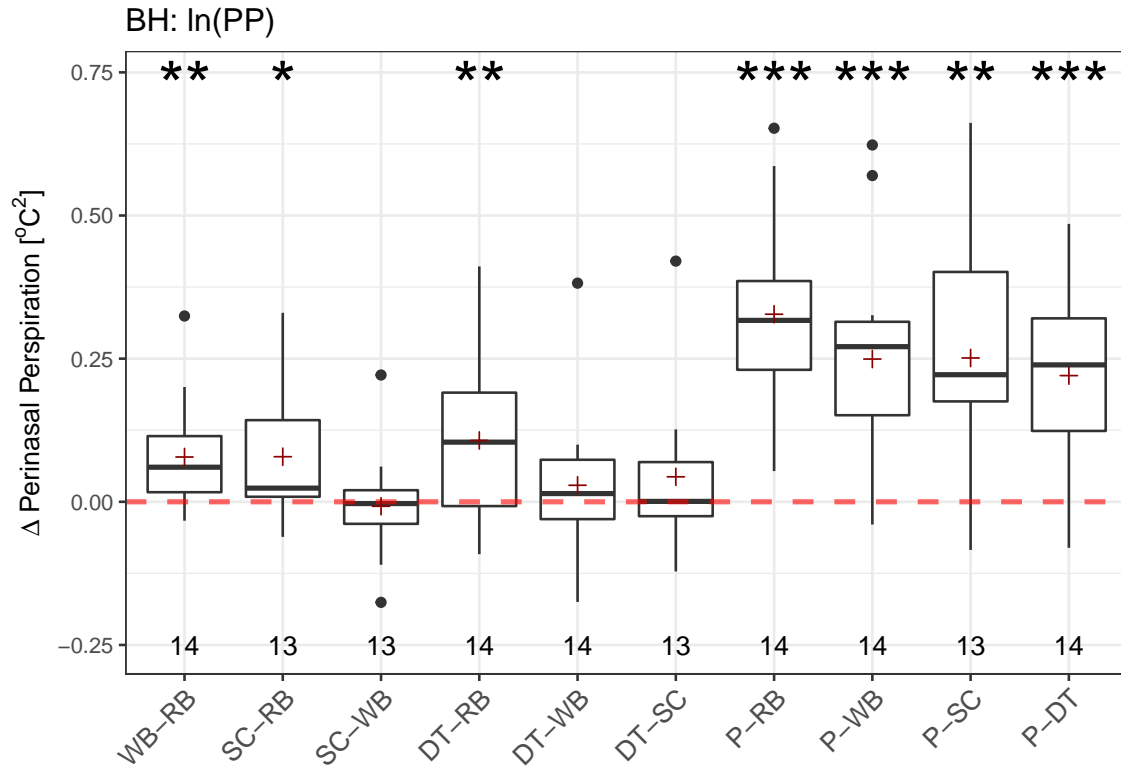






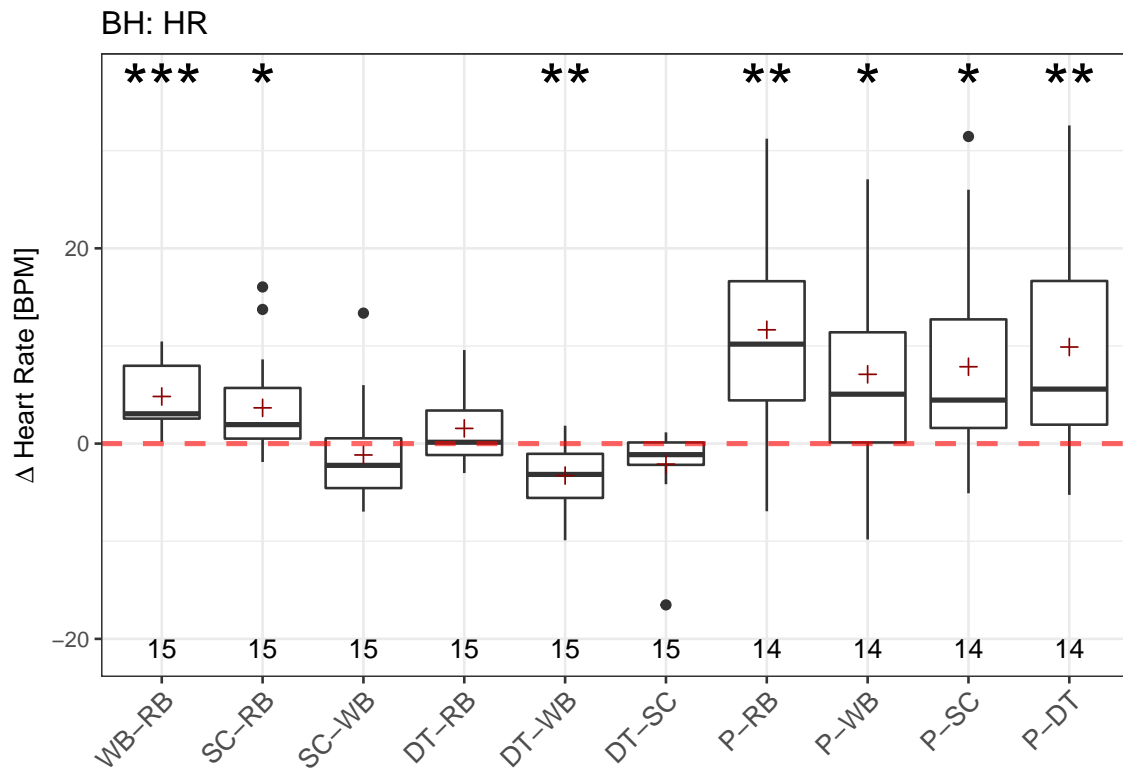


Sensor Channel across Activities



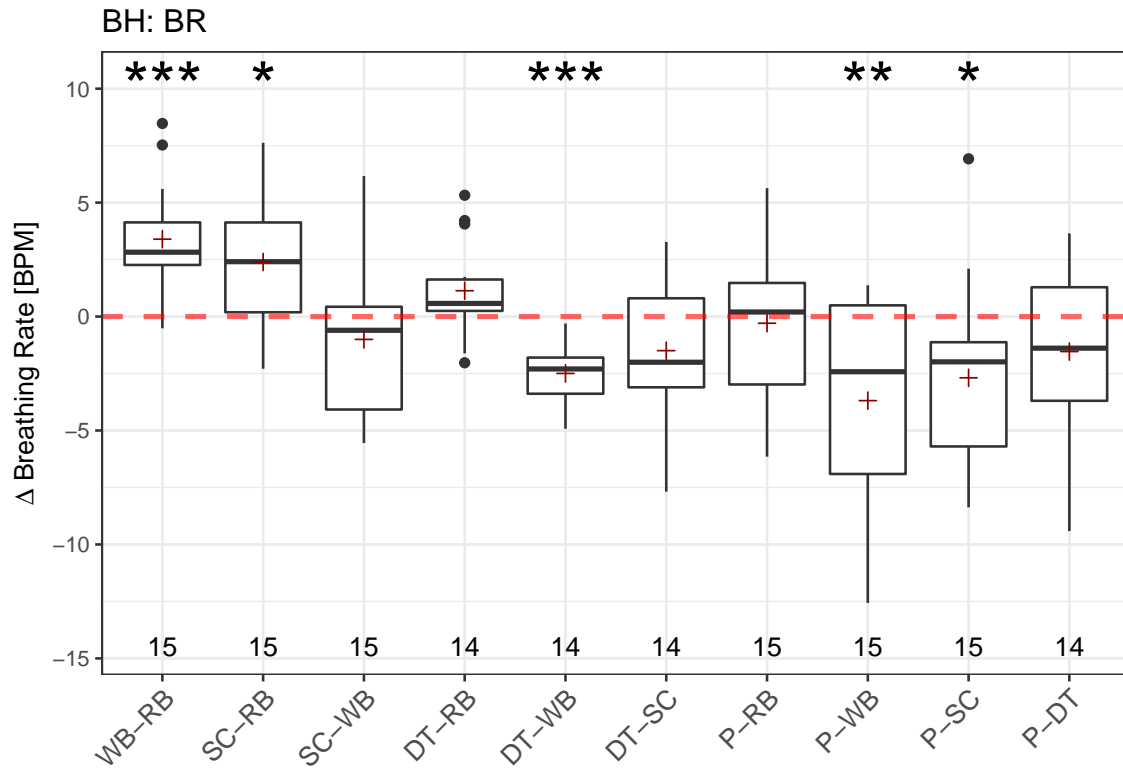
```
## Writing Baseline - Resting Baseline
## Transformed t-test p = 0.0094 < 0.01  **
##
## Stress Condition - Resting Baseline
## Transformed t-test p = 0.0274 < 0.05  *
##
## StressCondition - Writing Baseline
## Transformed t-test p = 0.7717 > 0.05
##
## Dual Task - Resting Baseline
## Transformed t-test p = 0.0095 < 0.01  **
##
## Dual Task - Writing Baseline
## Transformed t-test p = 0.4009 > 0.05
##
## Dual Task - Stress Condition
## Transformed t-test p = 0.2531 > 0.05
##
## Presentation - Resting Baseline
## Transformed t-test p = 0 < 0.001  ***
##
## Presentation - Writing Baseline
## Transformed t-test p = 3e-04 < 0.001  ***
```

```
##  
## Presentation - Stress Condition  
## Transformed t-test p = 0.0016 < 0.01  **  
##  
## Presentation - Dual Task  
## Transformed t-test p = 1e-04 < 0.001  ***
```



```
## Writing Baseline - Resting Baseline
## t-test p = 0 < 0.001 ***
##
## Stress Condition - Resting Baseline
## t-test p = 0.0207 < 0.05 *
##
## StressCondition - Writing Baseline
## t-test p = 0.4186 > 0.05
##
## Dual Task - Resting Baseline
## t-test p = 0.1257 > 0.05
##
## Dual Task - Writing Baseline
## t-test p = 0.0014 < 0.01 **
##
## Dual Task - Stress Condition
## t-test p = 0.0755 > 0.05
##
## Presentation - Resting Baseline
## t-test p = 0.0026 < 0.01 **
##
## Presentation - Writing Baseline
## t-test p = 0.0385 < 0.05 *
##
## Presentation - Stress Condition
```

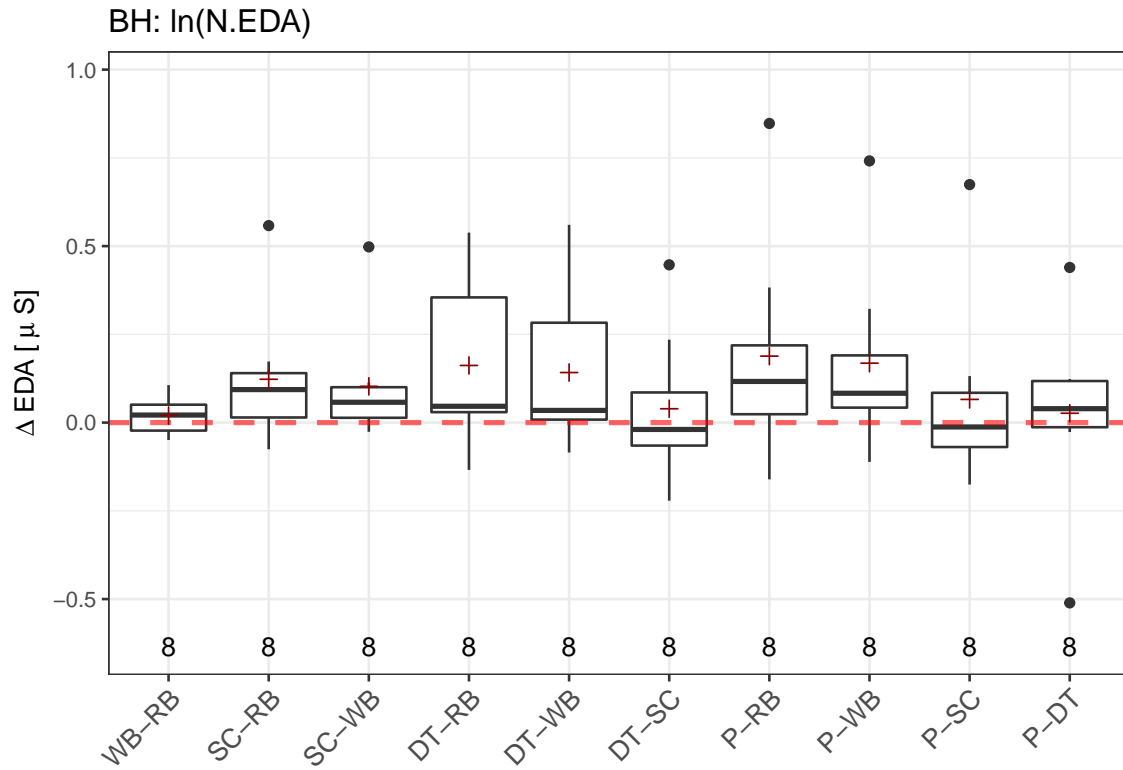
```
## t-test p = 0.0183 < 0.05  *  
##  
## Presentation - Dual Task  
## t-test p = 0.0084 < 0.01  **
```

```
## Writing Baseline - Resting Baseline
## t-test p = 1e-04 < 0.001 ***
##
## Stress Condition - Resting Baseline
## t-test p = 0.0101 < 0.05 *
##
## StressCondition - Writing Baseline
## t-test p = 0.2491 > 0.05
##
## Dual Task - Resting Baseline
## t-test p = 0.066 > 0.05
##
## Dual Task - Writing Baseline
## t-test p = 0 < 0.001 ***
##
## Dual Task - Stress Condition
## t-test p = 0.0783 > 0.05
##
## Presentation - Resting Baseline
## t-test p = 0.7444 > 0.05
##
## Presentation - Writing Baseline
## t-test p = 0.0065 < 0.01 **
##
## Presentation - Stress Condition
```

```
## t-test p = 0.0272 < 0.05  *  
##  
## Presentation - Dual Task  
## t-test p = 0.1269 > 0.05
```

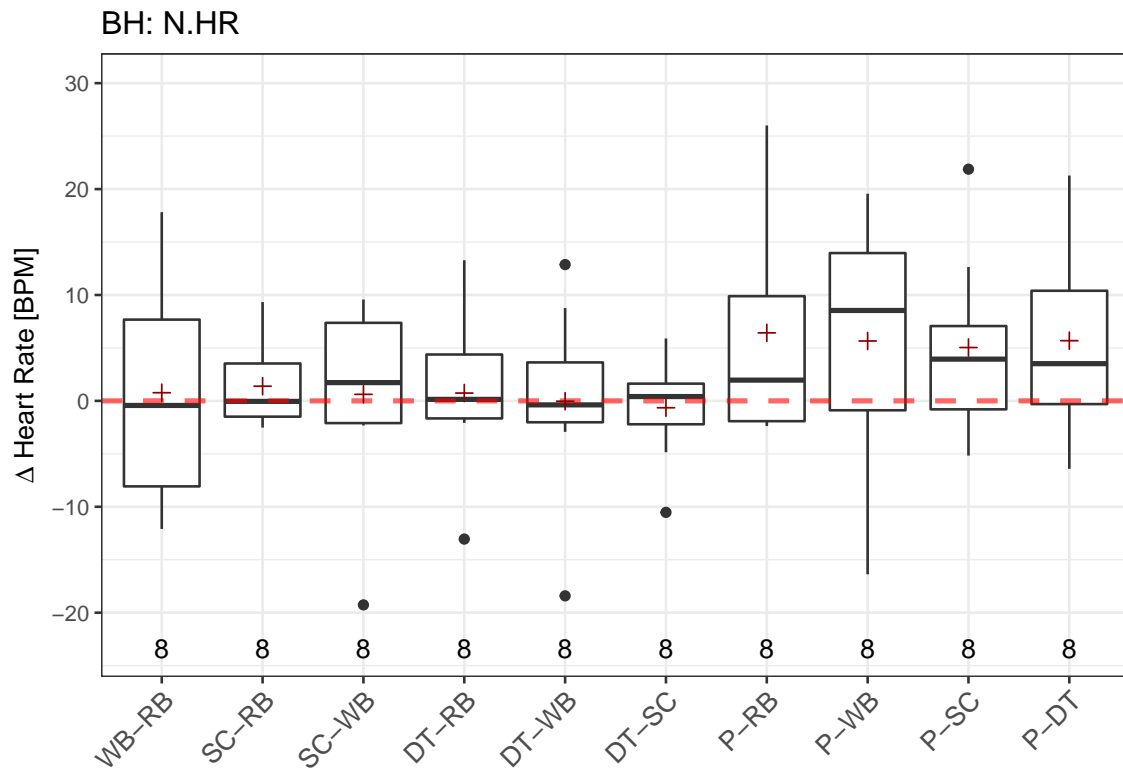
```
## BH has LESS than 7 subjects for D.EDA. Cannot continue with test.  
## -----
```



```
## Writing Baseline - Resting Baseline
## Transformed t-test p = 0.3082 > 0.05
##
## Stress Condition - Resting Baseline
## Transformed t-test p = 0.1157 > 0.05
##
## StressCondition - Writing Baseline
## Transformed t-test p = 0.1242 > 0.05
##
## Dual Task - Resting Baseline
## Transformed t-test p = 0.0914 > 0.05
##
## Dual Task - Writing Baseline
## Transformed t-test p = 0.1073 > 0.05
##
## Dual Task - Stress Condition
## Transformed t-test p = 0.6121 > 0.05
##
## Presentation - Resting Baseline
## Transformed t-test p = 0.1275 > 0.05
##
## Presentation - Writing Baseline
## Transformed t-test p = 0.112 > 0.05
##
## Presentation - Stress Condition
```

```
## Transformed t-test p = 0.5046 > 0.05
##
## Presentation - Dual Task
## Transformed t-test p = 0.7837 > 0.05
```

```
## BH has LESS than 7 subjects for D.HR. Cannot continue with test.
## -----
```

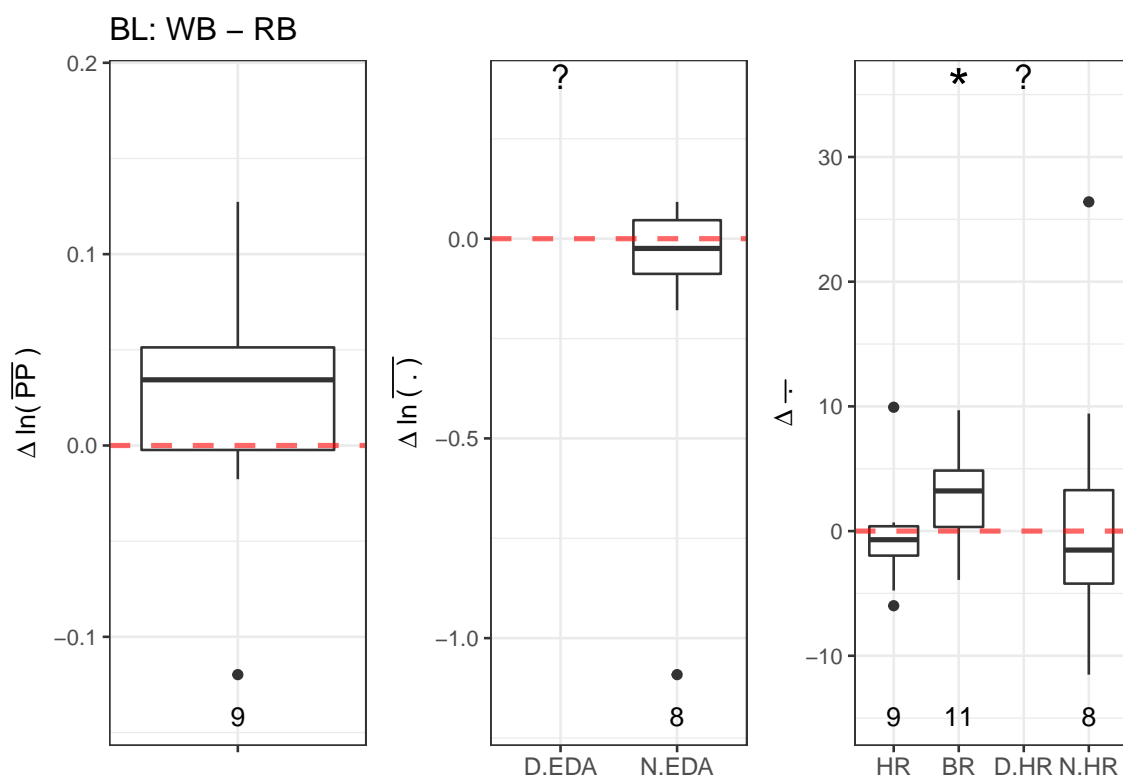


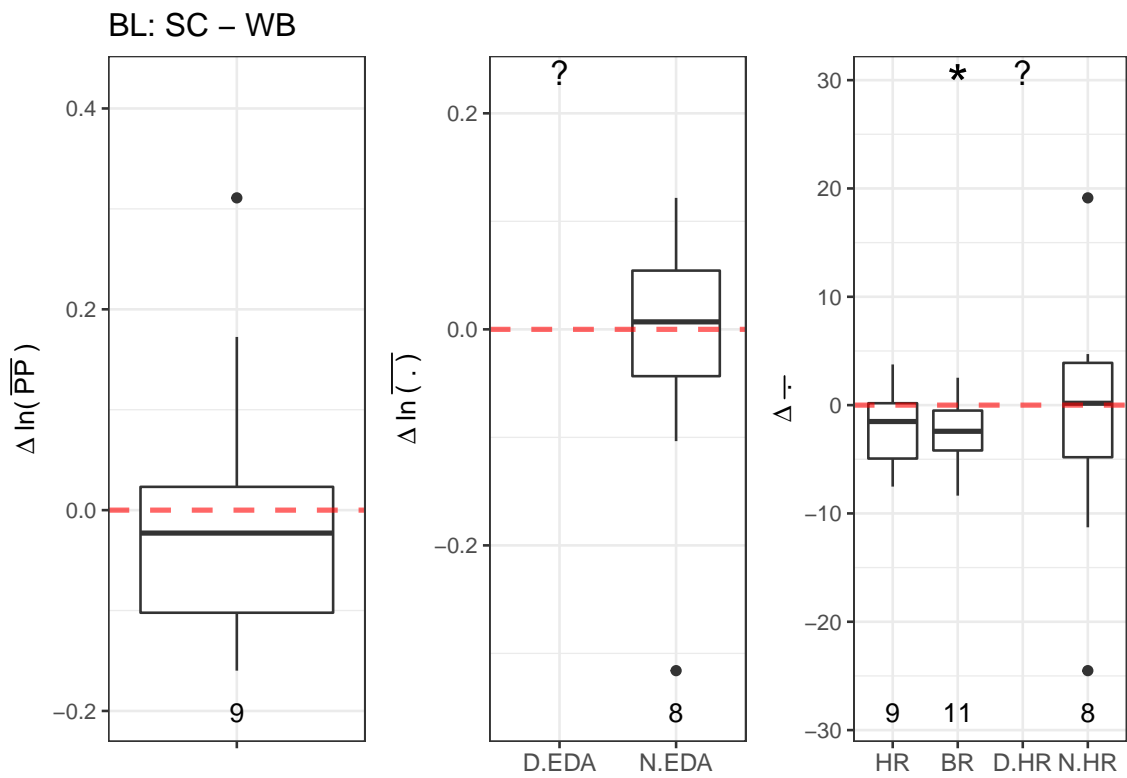
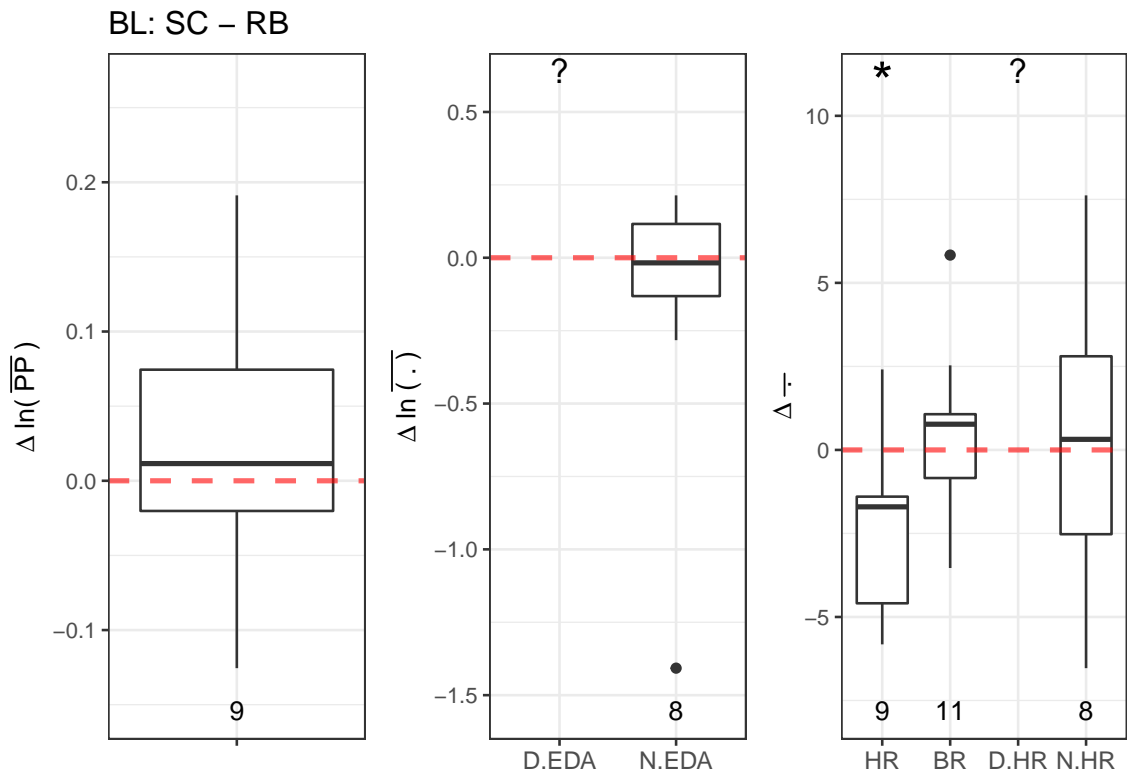
```
## Writing Baseline - Resting Baseline
## t-test p = 0.8417 > 0.05
##
## Stress Condition - Resting Baseline
## t-test p = 0.3592 > 0.05
##
## StressCondition - Writing Baseline
## t-test p = 0.8555 > 0.05
##
## Dual Task - Resting Baseline
## t-test p = 0.7879 > 0.05
##
## Dual Task - Writing Baseline
## t-test p = 0.9925 > 0.05
##
## Dual Task - Stress Condition
## t-test p = 0.7312 > 0.05
##
## Presentation - Resting Baseline
## t-test p = 0.1502 > 0.05
##
## Presentation - Writing Baseline
## t-test p = 0.2146 > 0.05
##
## Presentation - Stress Condition
```

```
## t-test p = 0.1441 > 0.05
##
## Presentation - Dual Task
## t-test p = 0.1209 > 0.05
```

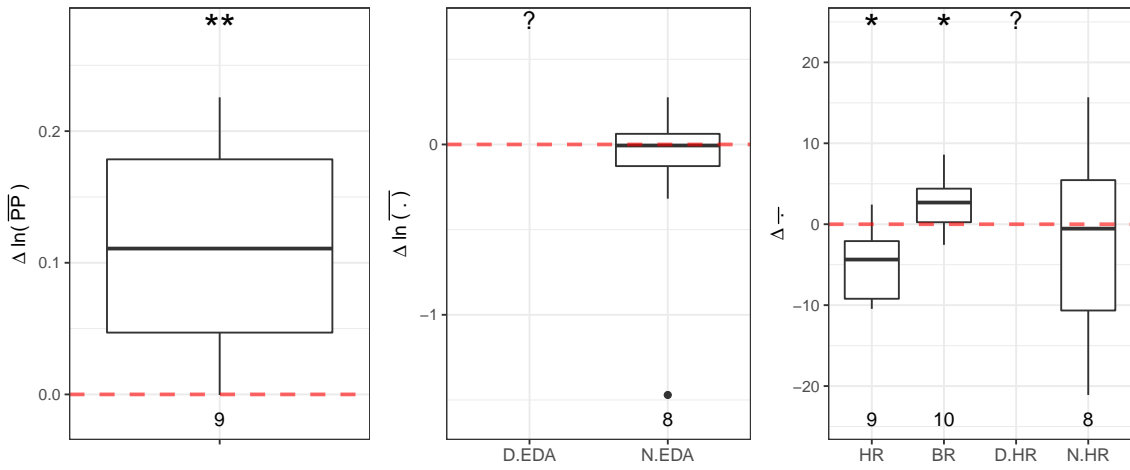
Batch-Low (BL)

Sensor Channels per Activity

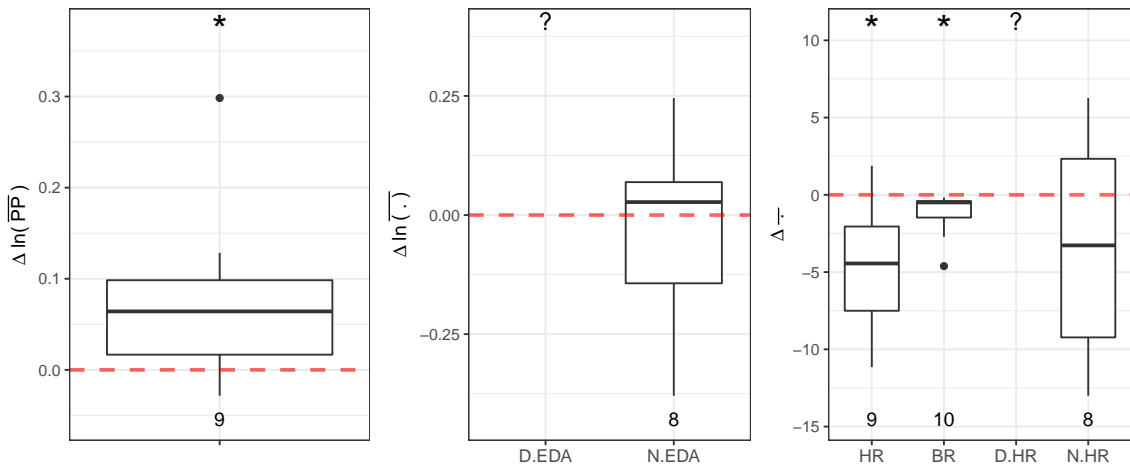




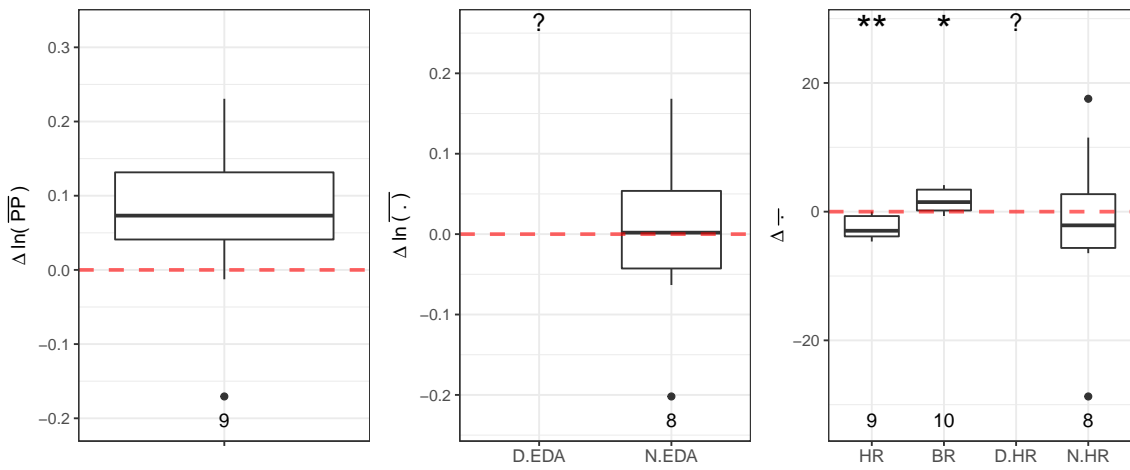
BL: DT – RB

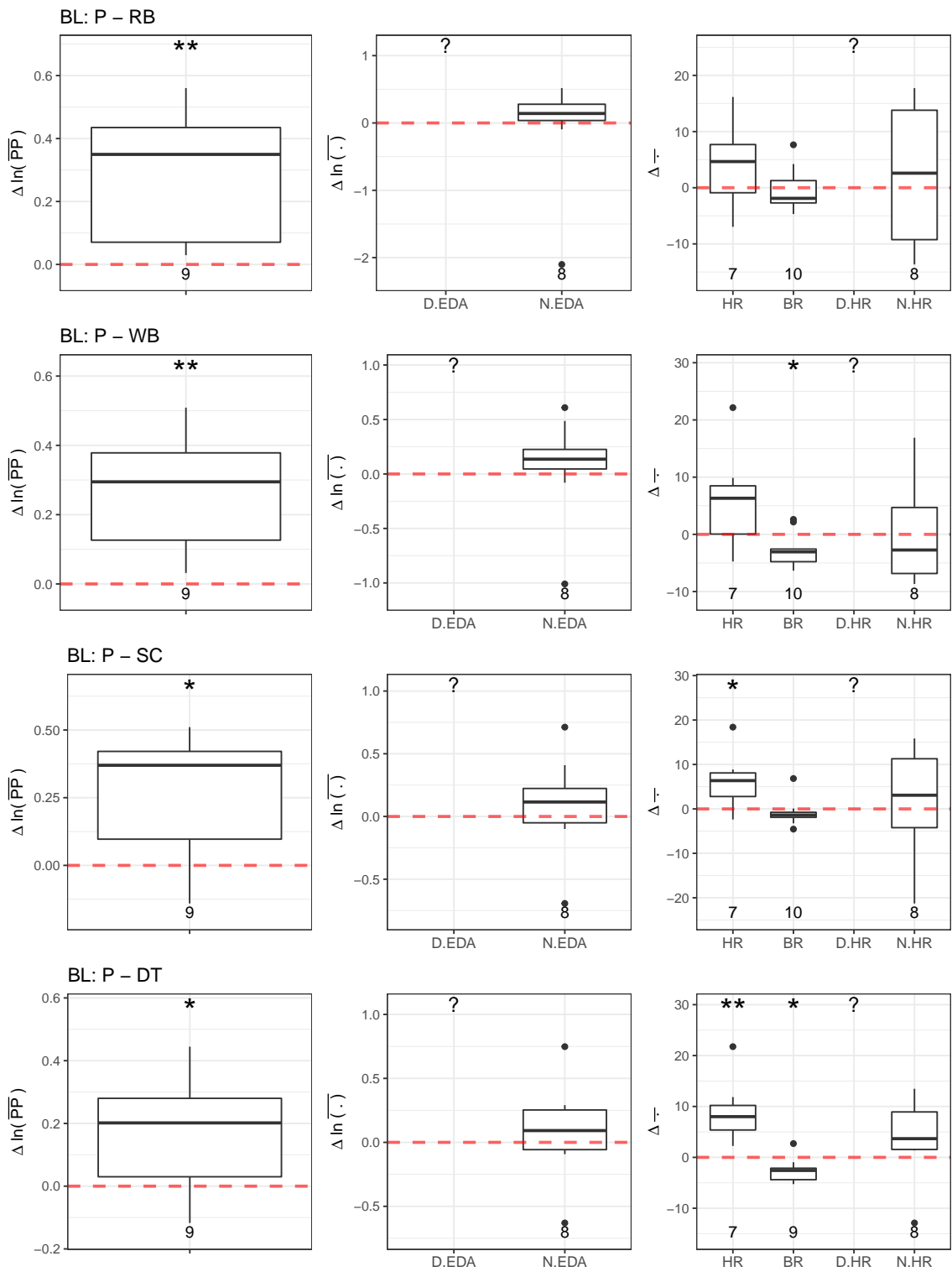


BL: DT – WB

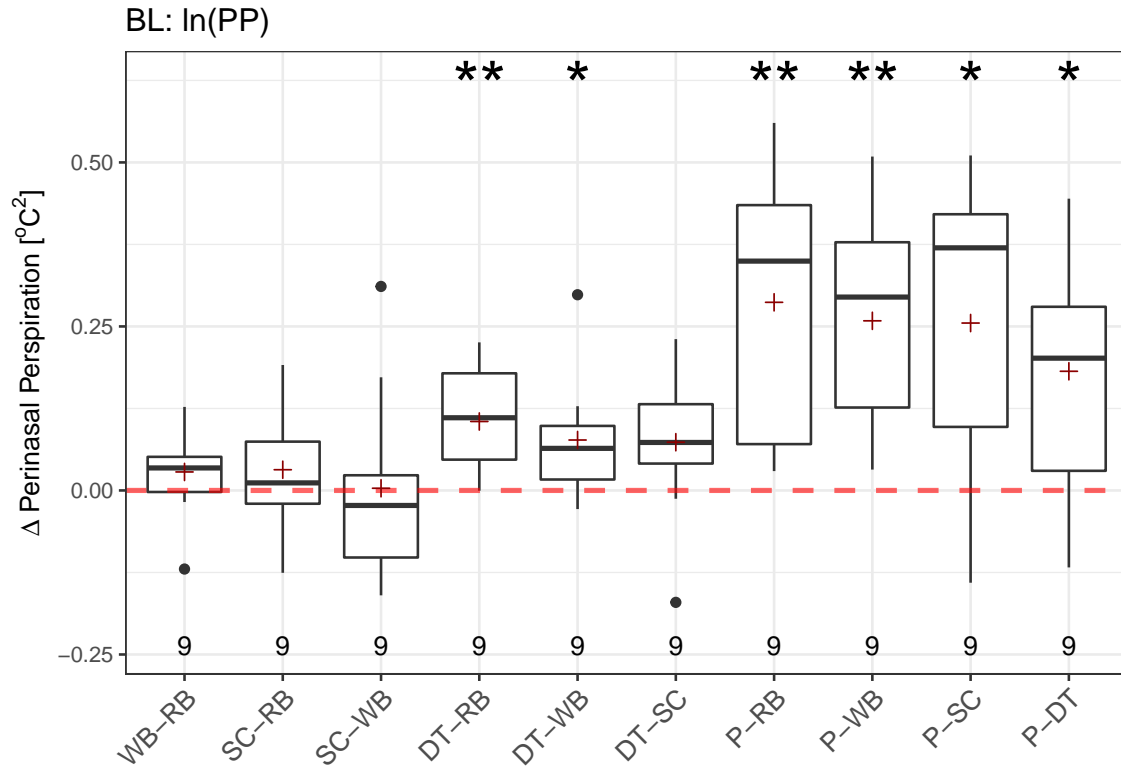


BL: DT – SC



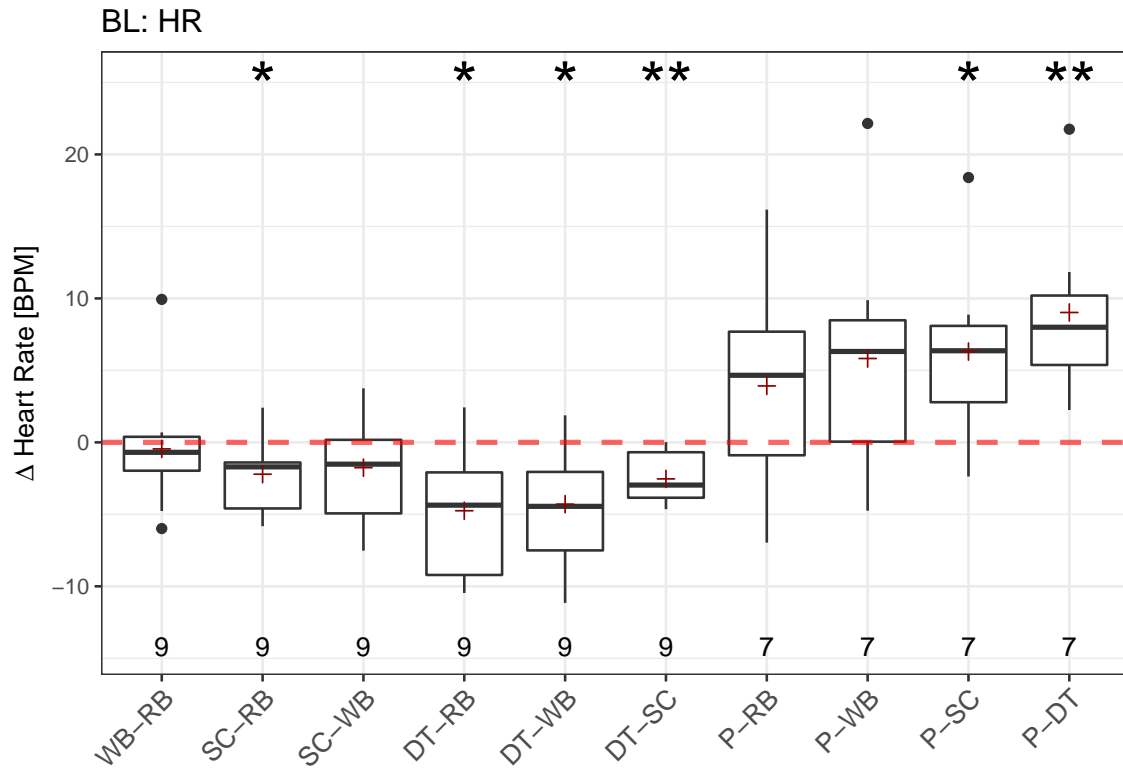


Sensor Channel across Activities



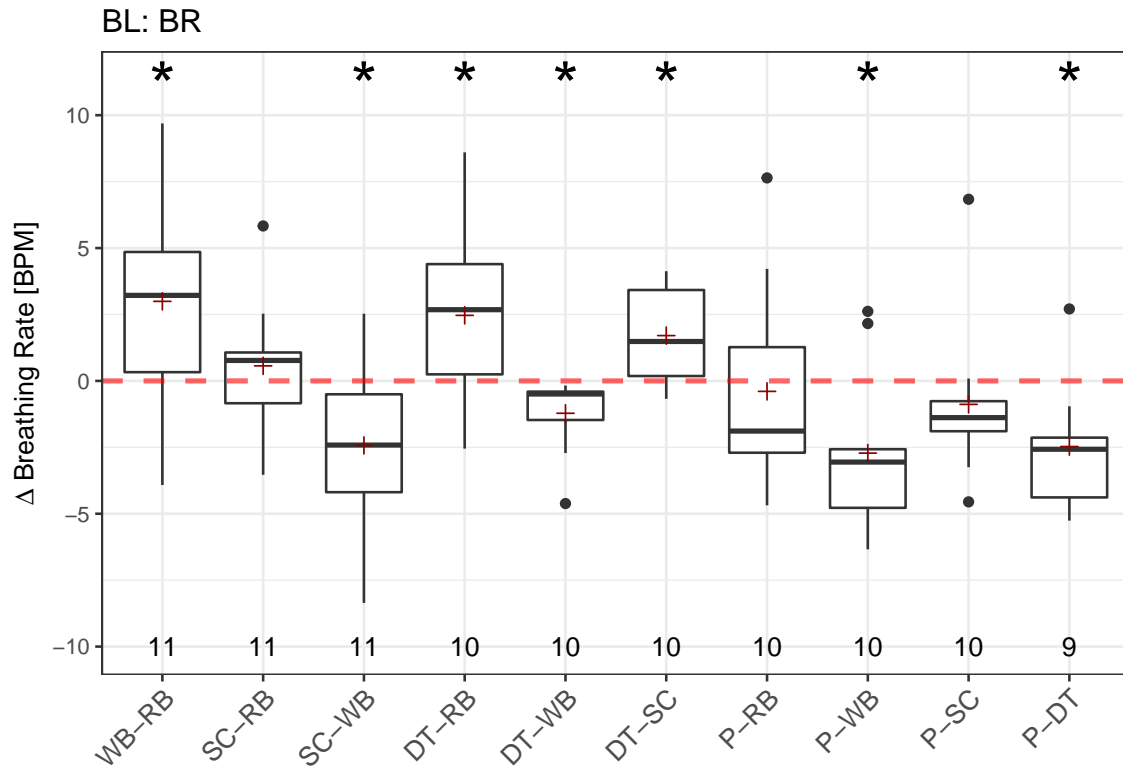
```
## Writing Baseline - Resting Baseline
## Transformed t-test p = 0.28 > 0.05
##
## Stress Condition - Resting Baseline
## Transformed t-test p = 0.3689 > 0.05
##
## StressCondition - Writing Baseline
## Transformed t-test p = 0.9484 > 0.05
##
## Dual Task - Resting Baseline
## Transformed t-test p = 0.0058 < 0.01  **
##
## Dual Task - Writing Baseline
## Transformed t-test p = 0.0457 < 0.05  *
##
## Dual Task - Stress Condition
## Transformed t-test p = 0.1034 > 0.05
##
## Presentation - Resting Baseline
## Transformed t-test p = 0.0032 < 0.01  **
##
## Presentation - Writing Baseline
## Transformed t-test p = 0.0019 < 0.01  **
```

```
##  
## Presentation - Stress Condition  
## Transformed t-test  $p = 0.0163 < 0.05$  *  
##  
## Presentation - Dual Task  
## Transformed t-test  $p = 0.0164 < 0.05$  *
```



```
## Writing Baseline - Resting Baseline
## t-test p = 0.7702 > 0.05
##
## Stress Condition - Resting Baseline
## t-test p = 0.0428 < 0.05  *
##
## StressCondition - Writing Baseline
## t-test p = 0.2133 > 0.05
##
## Dual Task - Resting Baseline
## t-test p = 0.0122 < 0.05  *
##
## Dual Task - Writing Baseline
## t-test p = 0.0169 < 0.05  *
##
## Dual Task - Stress Condition
## t-test p = 0.0027 < 0.01  **
##
## Presentation - Resting Baseline
## t-test p = 0.2311 > 0.05
##
## Presentation - Writing Baseline
## t-test p = 0.1334 > 0.05
##
## Presentation - Stress Condition
```

```
## t-test p = 0.0432 < 0.05  *  
##  
## Presentation - Dual Task  
## t-test p = 0.0097 < 0.01  **
```

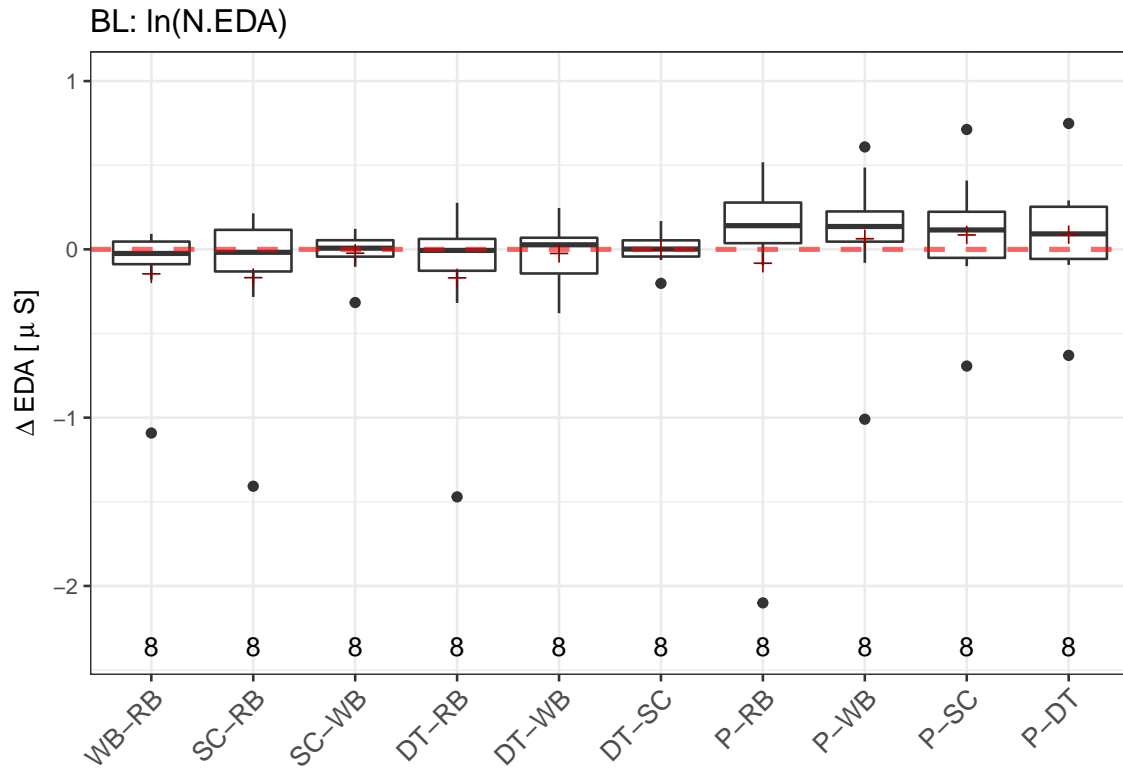


```
## Writing Baseline - Resting Baseline
## t-test p = 0.0333 < 0.05  *
##
## Stress Condition - Resting Baseline
## t-test p = 0.4497 > 0.05
##
## StressCondition - Writing Baseline
## t-test p = 0.0213 < 0.05  *
##
## Dual Task - Resting Baseline
## t-test p = 0.0377 < 0.05  *
##
## Dual Task - Writing Baseline
## t-test p = 0.0248 < 0.05  *
##
## Dual Task - Stress Condition
## t-test p = 0.0141 < 0.05  *
##
## Presentation - Resting Baseline
## t-test p = 0.7553 > 0.05
##
## Presentation - Writing Baseline
## t-test p = 0.0173 < 0.05  *
##
## Presentation - Stress Condition
```



```
## t-test p = 0.3786 > 0.05
##
## Presentation - Dual Task
## t-test p = 0.014 < 0.05  *
```

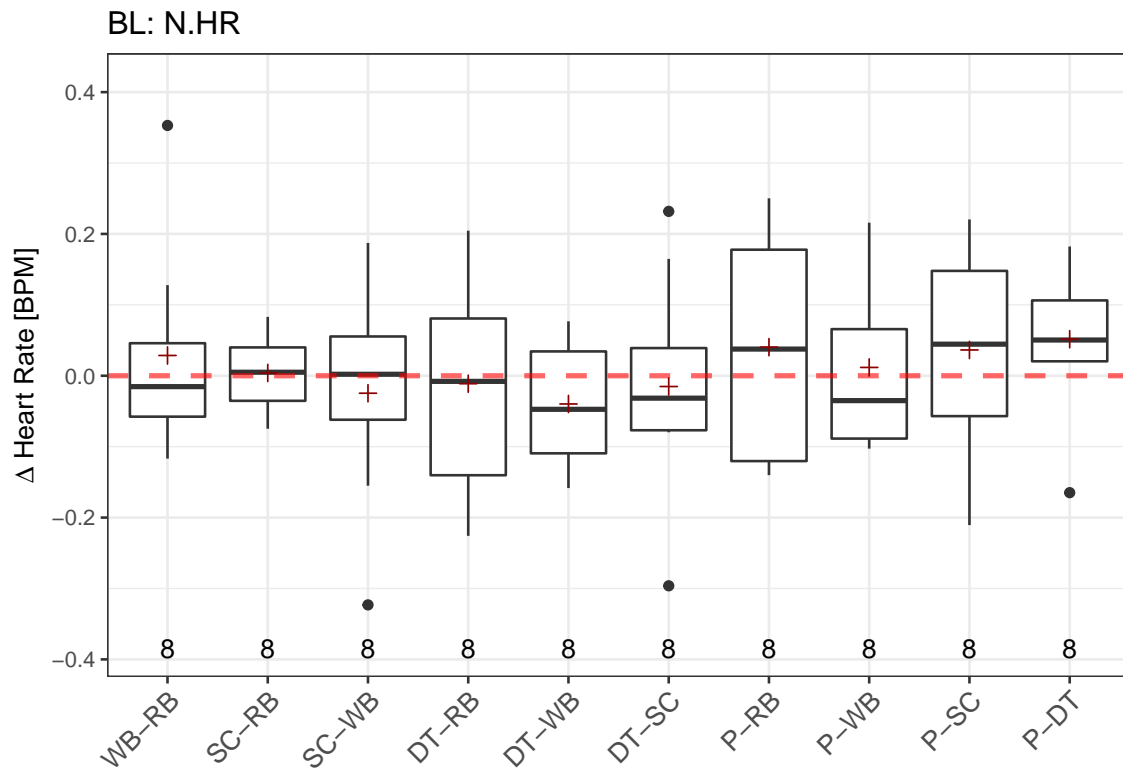
```
## BL has LESS than 7 subjects for D.EDA. Cannot continue with test.
## -----
```



```
## Writing Baseline - Resting Baseline
## Transformed t-test p = 0.3298 > 0.05
##
## Stress Condition - Resting Baseline
## Transformed t-test p = 0.394 > 0.05
##
## StressCondition - Writing Baseline
## Transformed t-test p = 0.6496 > 0.05
##
## Dual Task - Resting Baseline
## Transformed t-test p = 0.4177 > 0.05
##
## Dual Task - Writing Baseline
## Transformed t-test p = 0.736 > 0.05
##
## Dual Task - Stress Condition
## Transformed t-test p = 0.975 > 0.05
##
## Presentation - Resting Baseline
## Transformed t-test p = 0.7893 > 0.05
##
## Presentation - Writing Baseline
## Transformed t-test p = 0.7259 > 0.05
##
## Presentation - Stress Condition
```

```
## Transformed t-test p = 0.57 > 0.05
##
## Presentation - Dual Task
## Transformed t-test p = 0.5481 > 0.05
```

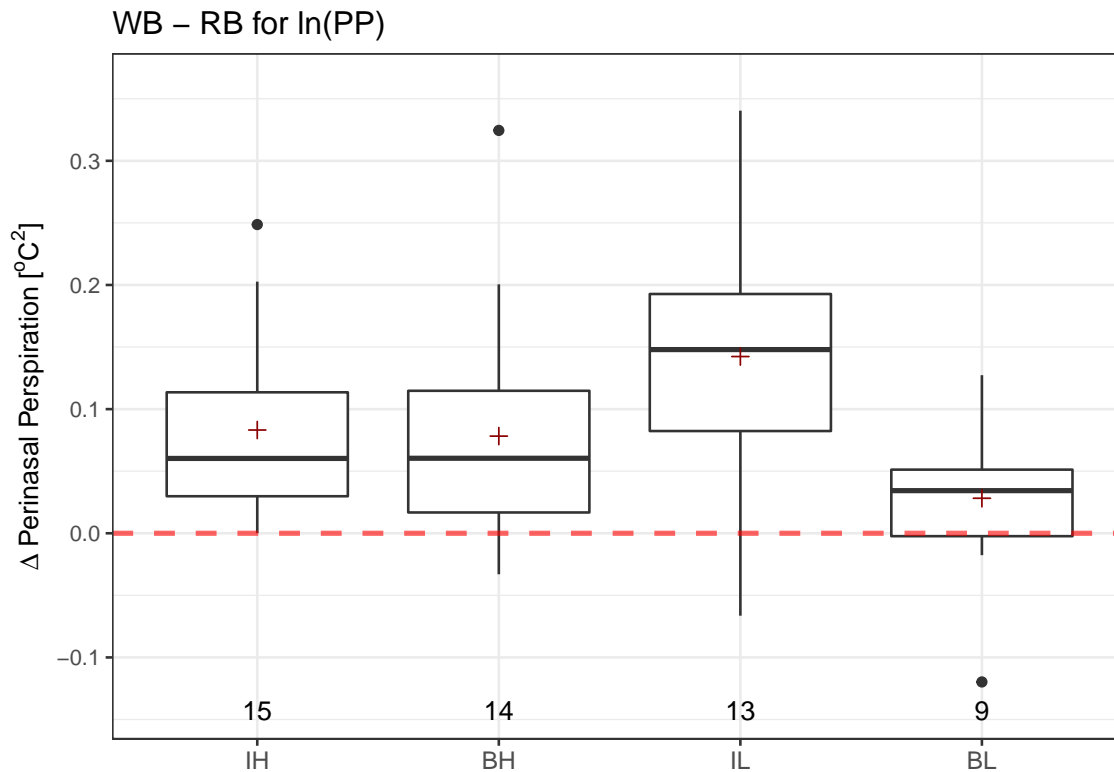
```
## BL has LESS than 7 subjects for D.HR. Cannot continue with test.
## -----
```



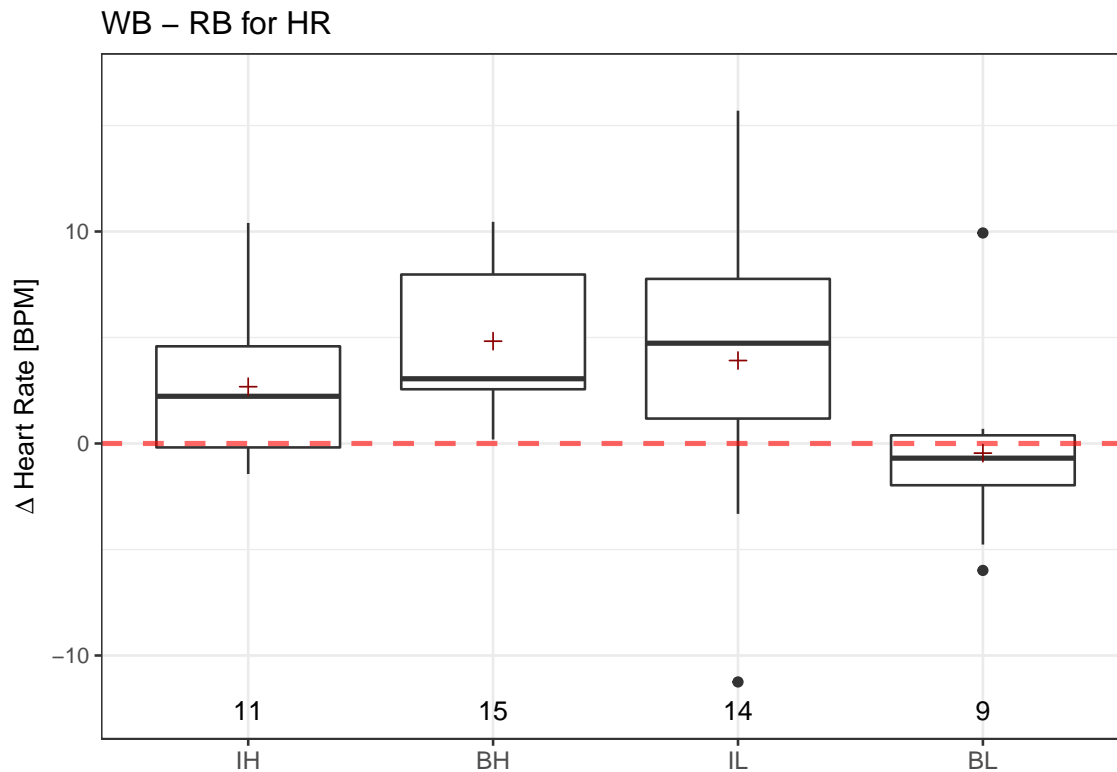
```
## Writing Baseline - Resting Baseline
## Wilcoxon p = 1 > 0.05
##
## Stress Condition - Resting Baseline
## Wilcoxon p = 0.8438 > 0.05
##
## StressCondition - Writing Baseline
## Wilcoxon p = 1 > 0.05
##
## Dual Task - Resting Baseline
## Wilcoxon p = 0.8438 > 0.05
##
## Dual Task - Writing Baseline
## Wilcoxon p = 0.3125 > 0.05
##
## Dual Task - Stress Condition
## Wilcoxon p = 0.5469 > 0.05
##
## Presentation - Resting Baseline
## Wilcoxon p = 0.4609 > 0.05
##
## Presentation - Writing Baseline
## Wilcoxon p = 0.8438 > 0.05
##
## Presentation - Stress Condition
```

```
## Wilcoxon p = 0.4609 > 0.05
##
## Presentation - Dual Task
## Wilcoxon p = 0.1094 > 0.05
```

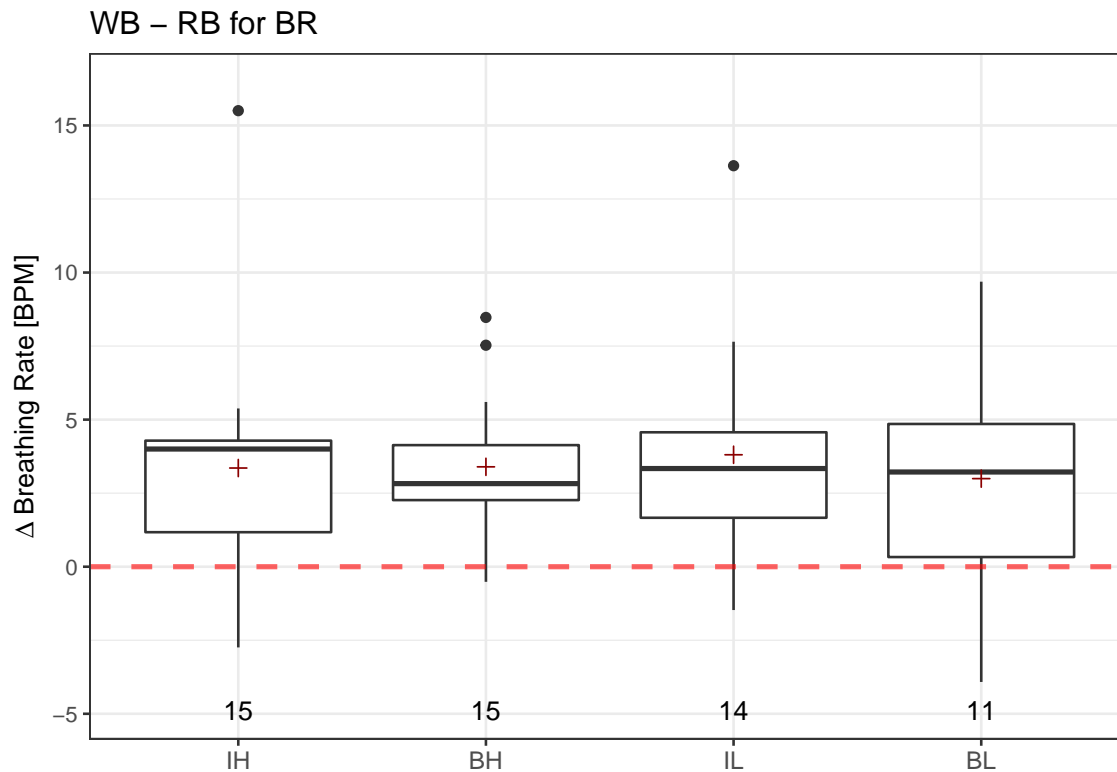
Across Activities



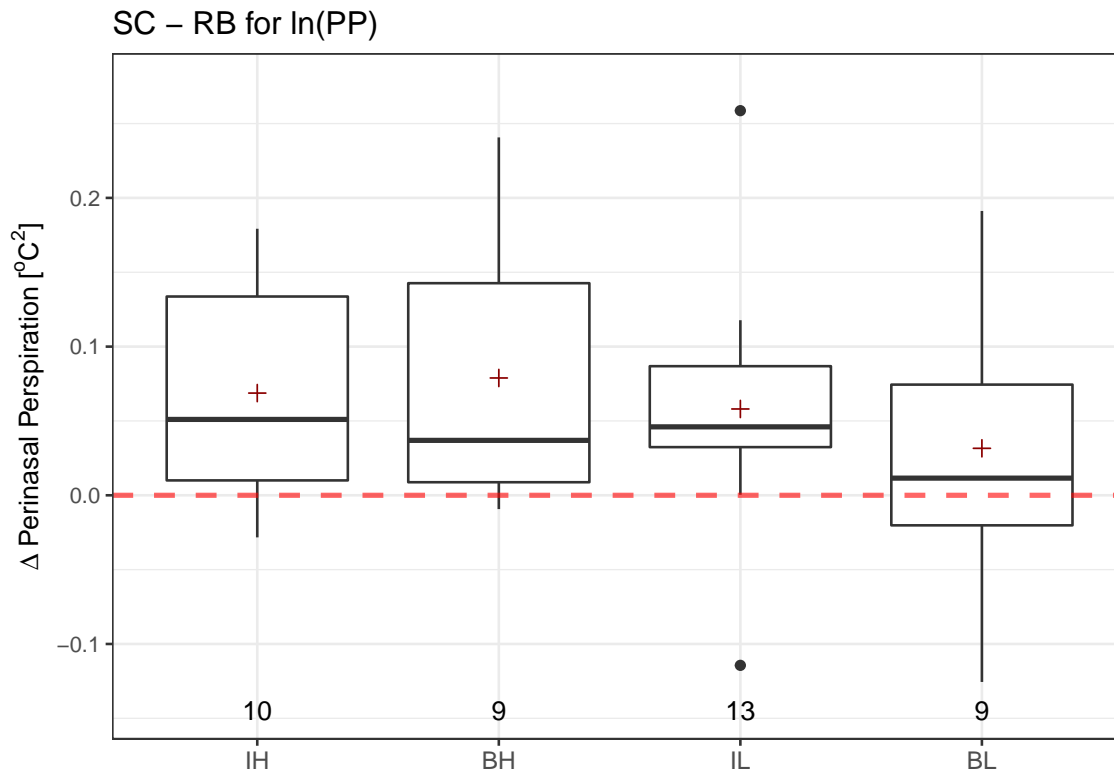
```
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3  0.0722  0.024069   2.878  0.0459 *
## Residuals  47  0.3931  0.008364
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## ---
##
##      Tukey multiple comparisons of means
##      95% family-wise confidence level
##
## Fit: aov(formula = formula(paste(diff, "~ Condition")), data = anova_df)
##
## $Condition
##           diff           lwr           upr           p adj
## BL-BH -0.050048480 -0.154118081  0.05402112  0.5794755
## IH-BH  0.004913916 -0.085604010  0.09543184  0.9989063
## IL-BH  0.064080898 -0.029738239  0.15790003  0.2773323
## IH-BL  0.054962396 -0.047740806  0.15766560  0.4902384
## IL-BL  0.114129377  0.008505124  0.21975363  0.0295865
## IL-IH  0.059166982 -0.033134135  0.15146810  0.3314313
```



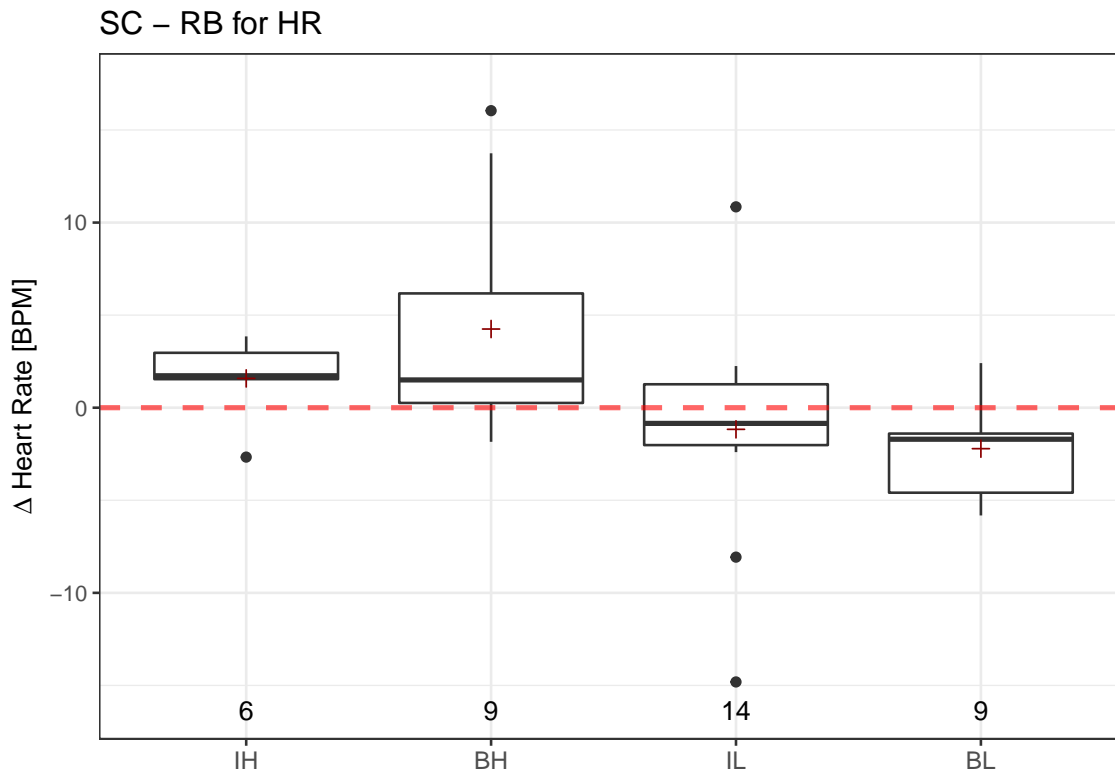
```
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3  169.7    56.55     2.56 0.0667 .
## Residuals  45  993.9    22.09
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## ---
##
##      Tukey multiple comparisons of means
##      95% family-wise confidence level
##
## Fit: aov(formula = formula(paste(diff, "~ Condition")), data = anova_df)
##
## $Condition
##           diff           lwr           upr           p adj
## BL-BH -5.2814127 -10.5675624  0.004736999 0.0502828
## IH-BH -2.1473334  -7.1240788  2.829411976 0.6602759
## IL-BH -0.9128669  -5.5718386  3.746104797 0.9531811
## IH-BL  3.1340793  -2.5009752  8.769133769 0.4555738
## IL-BL  4.3685458  -0.9879327  9.725024273 0.1456585
## IL-IH  1.2344665  -3.8169172  6.285850262 0.9143224
```

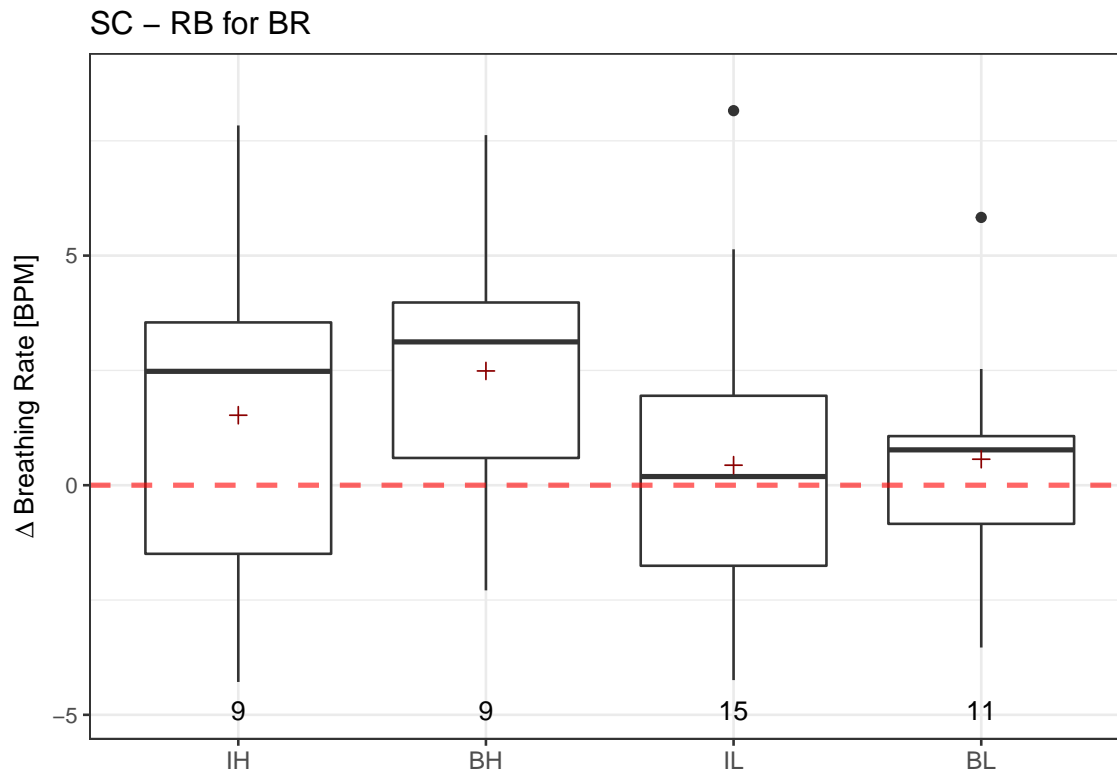
```
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3    4.1   1.379   0.104  0.957
## Residuals  51  674.3  13.221
##
## ---
##
##      Tukey multiple comparisons of means
##      95% family-wise confidence level
##
## Fit: aov(formula = formula(paste(diff, "~ Condition")), data = anova_df)
##
## $Condition
##           diff          lwr          upr          p adj
## BL-BH -0.40148619 -4.234840  3.431868  0.9923935
## IH-BH -0.04142166 -3.567594  3.484751  0.9999889
## IL-BH  0.40943480 -3.179153  3.998023  0.9902226
## IH-BL  0.36006453 -3.473289  4.193419  0.9944804
## IL-BL  0.81092099 -3.079923  4.701765  0.9451724
## IL-IH  0.45085646 -3.137731  4.039444  0.9870445
```



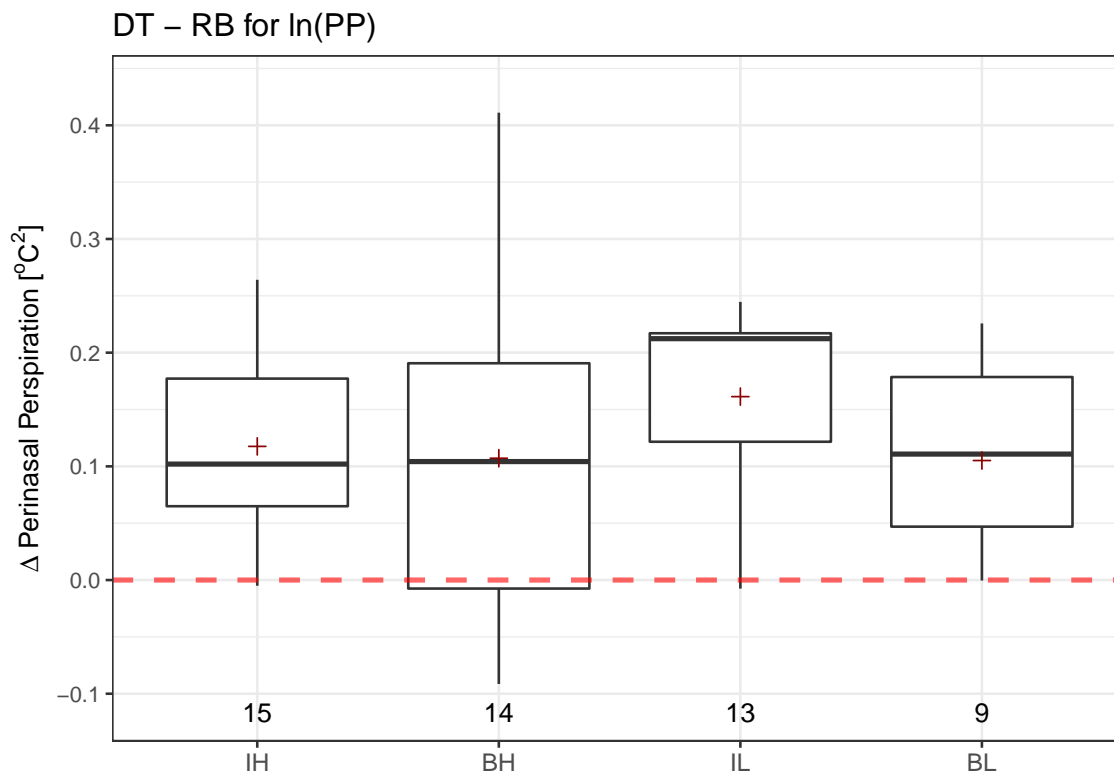
```
## [1] "Removed 12 subjects who had Stroop scores less than 30."
##
## ---
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3  0.01128  0.003759   0.501  0.684
## Residuals  37  0.27738  0.007497
##
## ---
##
## Tukey multiple comparisons of means
## 95% family-wise confidence level
##
## Fit: aov(formula = formula(paste(diff, "~ Condition")), data = anova_df)
##
## $Condition
##           diff           lwr           upr         p adj
## BL-BH -0.04730947 -0.15709362  0.06247467  0.6558749
## IH-BH -0.01016759 -0.11717194  0.09683676  0.9940422
## IL-BH -0.02085243 -0.12183916  0.08013430  0.9444883
## IH-BL  0.03714188 -0.06986247  0.14414623  0.7870589
## IL-BL  0.02645704 -0.07452969  0.12744377  0.8945909
## IL-IH -0.01068484 -0.10864244  0.08727276  0.9910628
```



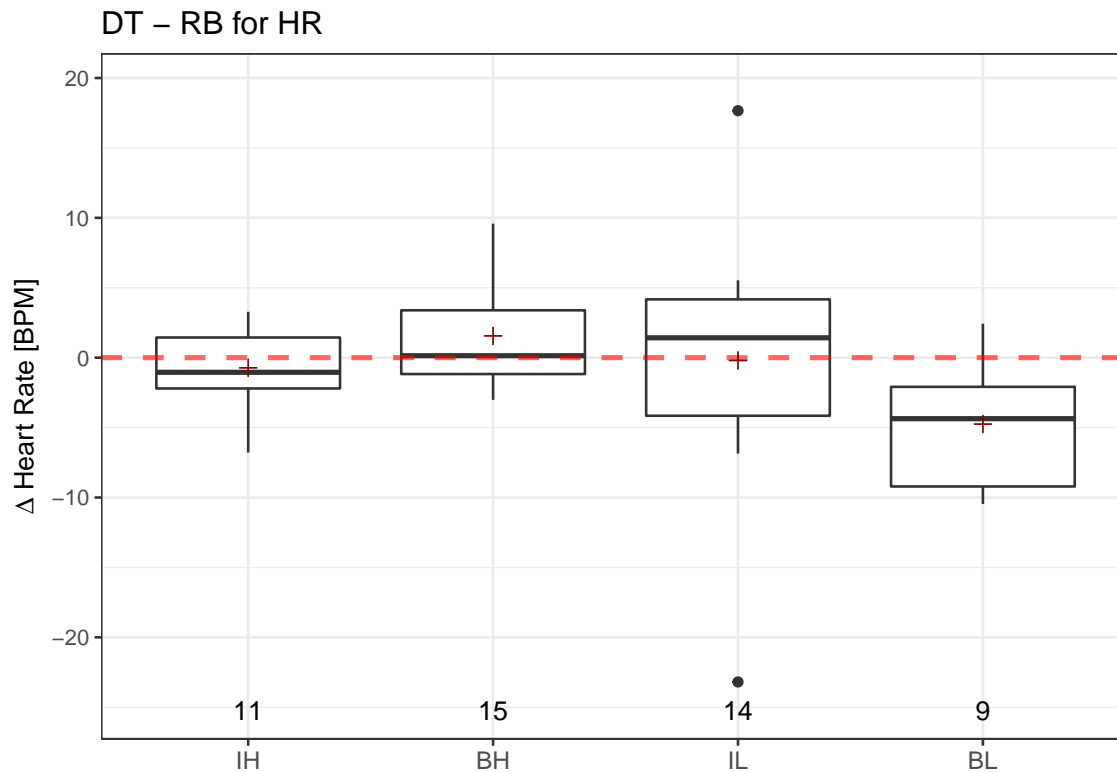
```
## [1] "Removed 12 subjects who had Stroop scores less than 30."
##
## ---
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3  237.3    79.09   3.202 0.0354 *
## Residuals  34  839.8    24.70
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## ---
##
##      Tukey multiple comparisons of means
##      95% family-wise confidence level
##
## Fit: aov(formula = formula(paste(diff, "~ Condition")), data = anova_df)
##
## $Condition
##           diff           lwr           upr         p adj
## BL-BH -6.462221 -12.789640  -0.1348014 0.0438279
## IH-BH -2.667175  -9.741445   4.4070944 0.7399742
## IL-BH -5.417700 -11.152411   0.3170101 0.0697190
## IH-BL  3.795045  -3.279224  10.8693150 0.4787008
## IL-BL  1.044520  -4.690191   6.7792307 0.9603634
## IL-IH -2.750525  -9.300026   3.7989759 0.6712975
```



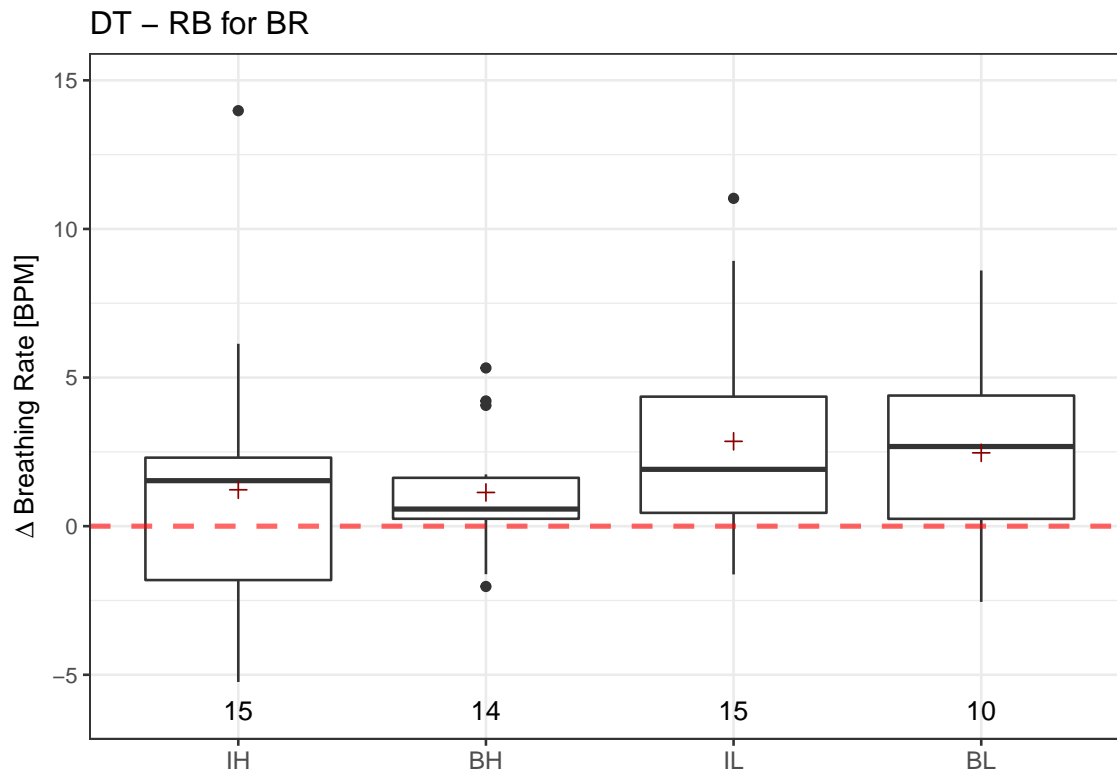
```
## [1] "Removed 12 subjects who had Stroop scores less than 30."
##
## ---
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3   28.7    9.57    0.916  0.442
## Residuals  40  417.7   10.44
##
## ---
##
## Tukey multiple comparisons of means
## 95% family-wise confidence level
##
## Fit: aov(formula = formula(paste(diff, "~ Condition")), data = anova_df)
##
## $Condition
##           diff           lwr           upr           p adj
## BL-BH -1.9219267 -5.814979  1.971126  0.5538979
## IH-BH -0.9638753 -5.046943  3.119193  0.9208512
## IL-BH -2.0523985 -5.704406  1.599609  0.4432901
## IH-BL  0.9580514 -2.935001  4.851104  0.9115233
## IL-BL -0.1304718 -3.568723  3.307779  0.9996166
## IL-IH -1.0885232 -4.740530  2.563484  0.8544828
```



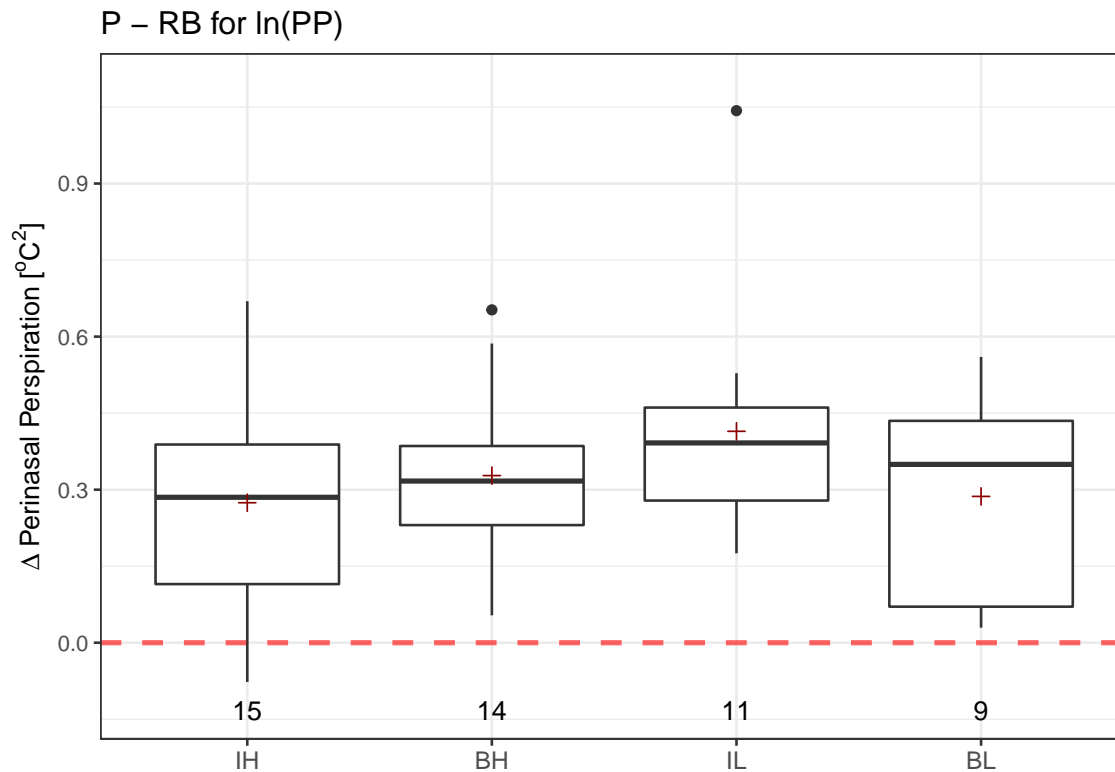
```
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3  0.0259  0.008645    0.898  0.449
## Residuals  47  0.4523  0.009624
##
## ---
##
##      Tukey multiple comparisons of means
##      95% family-wise confidence level
##
## Fit: aov(formula = formula(paste(diff, "~ Condition")), data = anova_df)
##
## $Condition
##           diff           lwr           upr           p adj
## BL-BH -0.002026867 -0.11365724  0.1096035  0.9999588
## IH-BH  0.010411558 -0.08668260  0.1075057  0.9917712
## IL-BH  0.054202923 -0.04643228  0.1548381  0.4846737
## IH-BL  0.012438425 -0.09772628  0.1226031  0.9904277
## IL-BL  0.056229790 -0.05706818  0.1695278  0.5539309
## IL-IH  0.043791365 -0.05521553  0.1427983  0.6435213
```



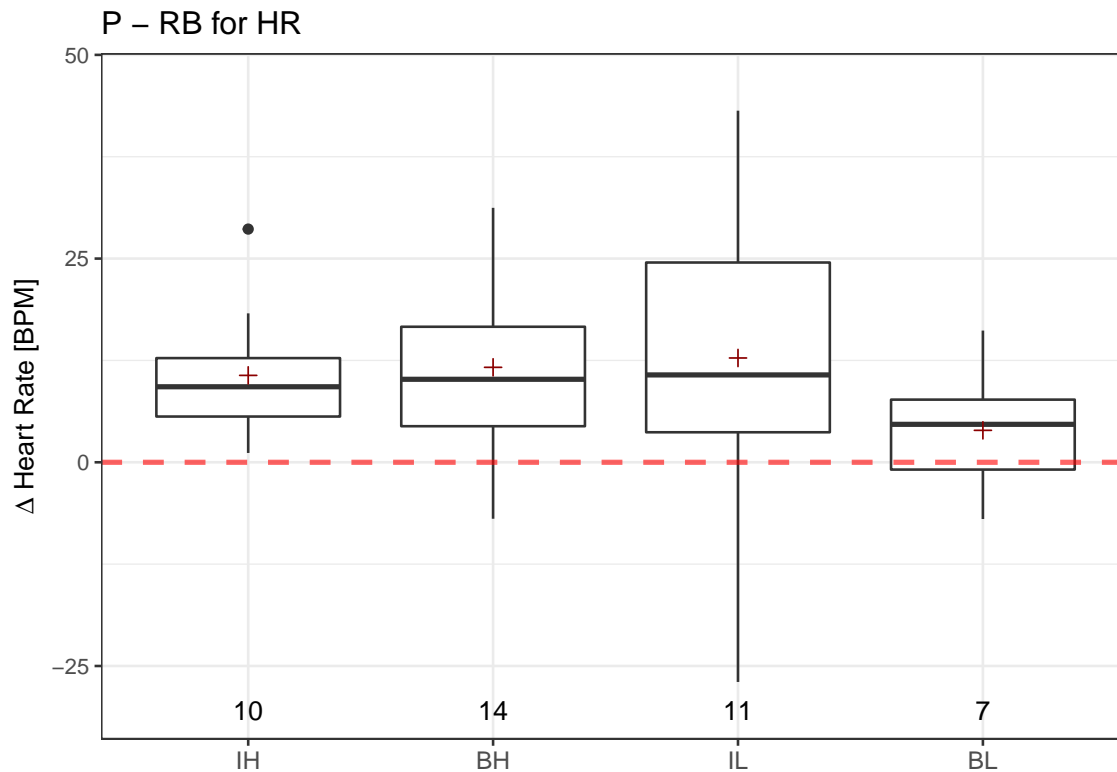
```
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3    227    75.68   2.292 0.0909 .
## Residuals  45   1486    33.02
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## ---
##
##      Tukey multiple comparisons of means
##      95% family-wise confidence level
##
## Fit: aov(formula = formula(paste(diff, "~ Condition")), data = anova_df)
##
## $Condition
##           diff           lwr           upr          p adj
## BL-BH -6.3047285 -12.768469  0.1590117 0.0582857
## IH-BH -2.2826067  -8.368017  3.8028035 0.7497856
## IL-BH -1.7554538  -7.452300  3.9413926 0.8437379
## IH-BL  4.0221219  -2.868248 10.9124921 0.4129178
## IL-BL  4.5492748  -2.000461 11.0990109 0.2627547
## IL-IH  0.5271529  -5.649523  6.7038286 0.9957790
```



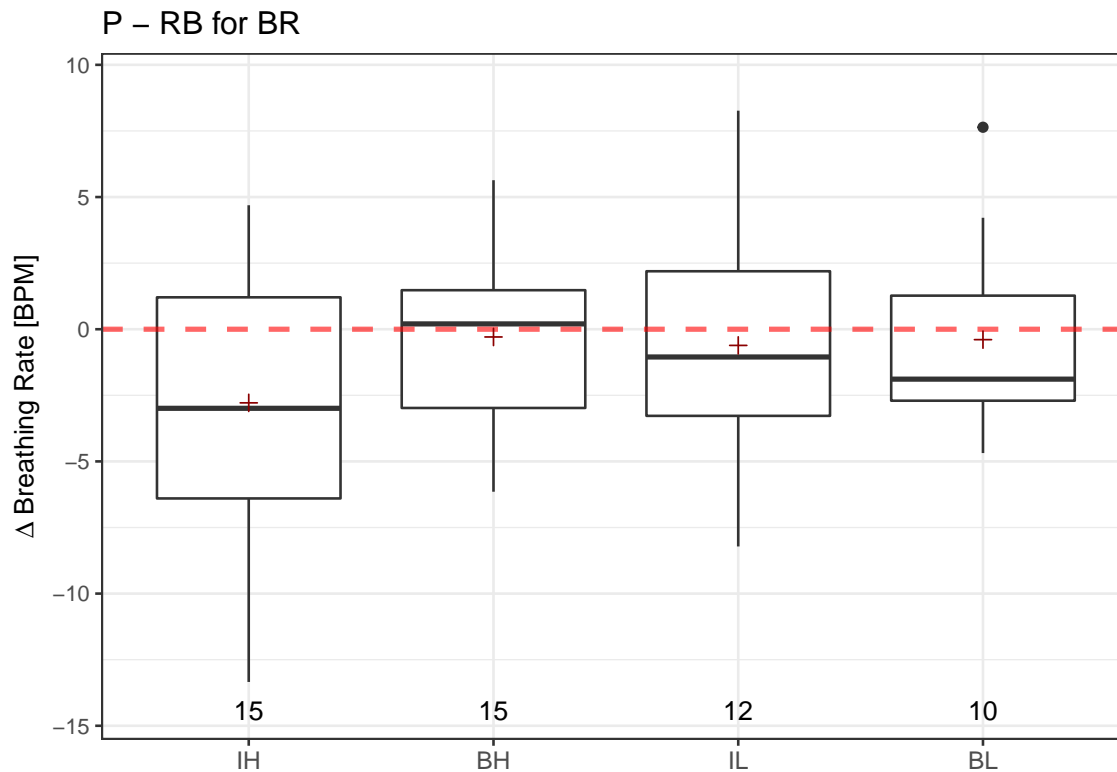
```
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition  3   31.9   10.64    0.806  0.497
## Residuals 50  660.1    13.20
##
## ---
##
##      Tukey multiple comparisons of means
##      95% family-wise confidence level
##
## Fit: aov(formula = formula(paste(diff, "~ Condition")), data = anova_df)
##
## $Condition
##           diff           lwr          upr         p adj
## BL-BH  1.33296028 -2.665173  5.331094  0.8120896
## IH-BH  0.09075228 -3.497682  3.679187  0.9998895
## IL-BH  1.72032421 -1.868110  5.308759  0.5834676
## IH-BL -1.24220800 -5.184421  2.700005  0.8363879
## IL-BL  0.38736393 -3.554849  4.329576  0.9936817
## IL-IH  1.62957193 -1.896450  5.155594  0.6121271
```



```
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3  0.1395  0.04649    1.144   0.342
## Residuals  45  1.8293  0.04065
##
## ---
##
##      Tukey multiple comparisons of means
##      95% family-wise confidence level
##
## Fit: aov(formula = formula(paste(diff, "~ Condition")), data = anova_df)
##
## $Condition
##           diff           lwr           upr         p adj
## BL-BH -0.04081441 -0.27061319  0.1889844  0.9644607
## IH-BH -0.05321849 -0.25309347  0.1466565  0.8924948
## IL-BH  0.08681677 -0.12989311  0.3035267  0.7101002
## IH-BL -0.01240408 -0.23918568  0.2143775  0.9988753
## IL-BL  0.12763118 -0.11411882  0.3693812  0.5008186
## IL-IH  0.14003526 -0.07347256  0.3535431  0.3107749
```

```
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3    380   126.6    0.732  0.539
## Residuals  38   6575   173.0
##
## ---
##
##      Tukey multiple comparisons of means
##      95% family-wise confidence level
##
## Fit: aov(formula = formula(paste(diff, "~ Condition")), data = anova_df)
##
## $Condition
##           diff           lwr          upr      p adj
## BL-BH -7.7337013 -24.092166  8.624763 0.5871706
## IH-BH -0.9906987 -15.622154 13.640757 0.9978251
## IL-BH  1.1453187 -13.092897 15.383535 0.9963734
## IH-BL  6.7430026 -10.671913 24.157918 0.7271380
## IL-BL  8.8790200  -8.206839 25.964879 0.5095144
## IL-IH  2.1360174 -13.304407 17.576442 0.9822160
```



```
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3   60.2   20.07    1.043  0.382
## Residuals  48  923.7   19.24
##
## ---
##
##      Tukey multiple comparisons of means
##      95% family-wise confidence level
##
## Fit: aov(formula = formula(paste(diff, "~ Condition")), data = anova_df)
##
## $Condition
##           diff           lwr          upr          p adj
## BL-BH -0.1014122 -4.867702  4.664878  0.9999339
## IH-BH -2.4921638 -6.755263  1.770936  0.4131373
## IL-BH -0.3193222 -4.841022  4.202378  0.9976122
## IH-BL -2.3907516 -7.157042  2.375539  0.5456873
## IL-BL -0.2179100 -5.216837  4.781017  0.9994335
## IL-IH  2.1728416 -2.348858  6.694541  0.5806199
```

Summary

Condition	Difference	Measure	p	Test	n	Significance
BH	WB - RB	PP	0.0094000	Transformed t-test	14	**
BH	WB - RB	HR	0.0000397	t-test	15	***
BH	WB - RB	BR	0.0000819	t-test	15	***
BH	WB - RB	N.EDA	0.3082373	Transformed t-test	8	
BH	WB - RB	N.HR	0.8417278	t-test	8	
BH	SC - RB	PP	0.0274263	Transformed t-test	13	*
BH	SC - RB	HR	0.0206642	t-test	15	*
BH	SC - RB	BR	0.0101217	t-test	15	*
BH	SC - RB	N.EDA	0.1157081	Transformed t-test	8	
BH	SC - RB	N.HR	0.3592209	t-test	8	
BH	SC - WB	PP	0.7716844	Transformed t-test	13	
BH	SC - WB	HR	0.4186405	t-test	15	
BH	SC - WB	BR	0.2490832	t-test	15	
BH	SC - WB	N.EDA	0.1241598	Transformed t-test	8	
BH	SC - WB	N.HR	0.8555270	t-test	8	
BH	DT - RB	PP	0.0095054	Transformed t-test	14	**
BH	DT - RB	HR	0.1257425	t-test	15	
BH	DT - RB	BR	0.0659588	t-test	14	
BH	DT - RB	N.EDA	0.0913543	Transformed t-test	8	
BH	DT - RB	N.HR	0.7878648	t-test	8	
BH	DT - WB	PP	0.4009000	Transformed t-test	14	
BH	DT - WB	HR	0.0014260	t-test	15	**
BH	DT - WB	BR	0.0000036	t-test	14	***
BH	DT - WB	N.EDA	0.1073219	Transformed t-test	8	
BH	DT - WB	N.HR	0.9925262	t-test	8	
BH	DT - SC	PP	0.2531438	Transformed t-test	13	
BH	DT - SC	HR	0.0754511	t-test	15	
BH	DT - SC	BR	0.0783487	t-test	14	
BH	DT - SC	N.EDA	0.6121291	Transformed t-test	8	
BH	DT - SC	N.HR	0.7312055	t-test	8	
BH	P - RB	PP	0.0000033	Transformed t-test	14	***
BH	P - RB	HR	0.0026135	t-test	14	**
BH	P - RB	BR	0.7444038	t-test	15	
BH	P - RB	N.EDA	0.1275027	Transformed t-test	8	
BH	P - RB	N.HR	0.1501817	t-test	8	
BH	P - WB	PP	0.0003191	Transformed t-test	14	***
BH	P - WB	HR	0.0384611	t-test	14	*
BH	P - WB	BR	0.0064616	t-test	15	**
BH	P - WB	N.EDA	0.1120002	Transformed t-test	8	
BH	P - WB	N.HR	0.2145898	t-test	8	
BH	P - SC	PP	0.0016041	Transformed t-test	13	**
BH	P - SC	HR	0.0182793	t-test	14	*
BH	P - SC	BR	0.0271823	t-test	15	*
BH	P - SC	N.EDA	0.5045767	Transformed t-test	8	
BH	P - SC	N.HR	0.1441297	t-test	8	

(continued)

Condition	Difference	Measure	p	Test	n	Significance
BH	P - DT	PP	0.0001125	Transformed t-test	14	***
BH	P - DT	HR	0.0083713	t-test	14	**
BH	P - DT	BR	0.1269182	t-test	14	
BH	P - DT	N.EDA	0.7836899	Transformed t-test	8	
BH	P - DT	N.HR	0.1208967	t-test	8	
BL	WB - RB	PP	0.2800303	Transformed t-test	9	
BL	WB - RB	HR	0.7702325	t-test	9	
BL	WB - RB	BR	0.0332722	t-test	11	*
BL	WB - RB	N.EDA	0.3297979	Transformed t-test	8	
BL	WB - RB	N.HR	1.0000000	Wilcoxon	8	
BL	SC - RB	PP	0.3689067	Transformed t-test	9	
BL	SC - RB	HR	0.0428335	t-test	9	*
BL	SC - RB	BR	0.4496888	t-test	11	
BL	SC - RB	N.EDA	0.3939893	Transformed t-test	8	
BL	SC - RB	N.HR	0.8437500	Wilcoxon	8	
BL	SC - WB	PP	0.9484117	Transformed t-test	9	
BL	SC - WB	HR	0.2133105	t-test	9	
BL	SC - WB	BR	0.0212998	t-test	11	*
BL	SC - WB	N.EDA	0.6495591	Transformed t-test	8	
BL	SC - WB	N.HR	1.0000000	Wilcoxon	8	
BL	DT - RB	PP	0.0057841	Transformed t-test	9	**
BL	DT - RB	HR	0.0122494	t-test	9	*
BL	DT - RB	BR	0.0377051	t-test	10	*
BL	DT - RB	N.EDA	0.4176734	Transformed t-test	8	
BL	DT - RB	N.HR	0.8437500	Wilcoxon	8	
BL	DT - WB	PP	0.0456952	Transformed t-test	9	*
BL	DT - WB	HR	0.0169332	t-test	9	*
BL	DT - WB	BR	0.0248169	t-test	10	*
BL	DT - WB	N.EDA	0.7359741	Transformed t-test	8	
BL	DT - WB	N.HR	0.3125000	Wilcoxon	8	
BL	DT - SC	PP	0.1033784	Transformed t-test	9	
BL	DT - SC	HR	0.0027195	t-test	9	**
BL	DT - SC	BR	0.0141386	t-test	10	*
BL	DT - SC	N.EDA	0.9749690	Transformed t-test	8	
BL	DT - SC	N.HR	0.5468750	Wilcoxon	8	
BL	P - RB	PP	0.0031874	Transformed t-test	9	**
BL	P - RB	HR	0.2311147	t-test	7	
BL	P - RB	BR	0.7553236	t-test	10	
BL	P - RB	N.EDA	0.7892852	Transformed t-test	8	
BL	P - RB	N.HR	0.4609375	Wilcoxon	8	
BL	P - WB	PP	0.0018648	Transformed t-test	9	**
BL	P - WB	HR	0.1333641	t-test	7	
BL	P - WB	BR	0.0172680	t-test	10	*
BL	P - WB	N.EDA	0.7258715	Transformed t-test	8	
BL	P - WB	N.HR	0.8437500	Wilcoxon	8	
BL	P - SC	PP	0.0162708	Transformed t-test	9	*
BL	P - SC	HR	0.0432154	t-test	7	*

(continued)

Condition	Difference	Measure	p	Test	n	Significance
BL	P - SC	BR	0.3786099	t-test	10	
BL	P - SC	N.EDA	0.5700326	Transformed t-test	8	
BL	P - SC	N.HR	0.4609375	Wilcoxon	8	
BL	P - DT	PP	0.0164035	Transformed t-test	9	*
BL	P - DT	HR	0.0097486	t-test	7	**
BL	P - DT	BR	0.0139682	t-test	9	*
BL	P - DT	N.EDA	0.5481070	Transformed t-test	8	
BL	P - DT	N.HR	0.1093750	Wilcoxon	8	
IH	WB - RB	PP	0.0006307	Transformed t-test	15	***
IH	WB - RB	HR	0.0314563	t-test	11	*
IH	WB - RB	BR	0.0083163	t-test	15	**
IH	WB - RB	N.EDA	0.3383382	Transformed t-test	8	
IH	WB - RB	N.HR	0.8055849	Transformed t-test	8	
IH	SC - RB	PP	0.0118489	Transformed t-test	14	*
IH	SC - RB	HR	0.2034842	t-test	11	
IH	SC - RB	BR	0.0915599	t-test	15	
IH	SC - RB	N.EDA	0.2702688	Transformed t-test	8	
IH	SC - RB	N.HR	0.6971260	Transformed t-test	8	
IH	SC - WB	PP	0.1644439	Transformed t-test	14	
IH	SC - WB	HR	0.2709306	t-test	11	
IH	SC - WB	BR	0.0506174	t-test	15	
IH	SC - WB	N.EDA	0.4462177	Transformed t-test	8	
IH	SC - WB	N.HR	0.7377091	Transformed t-test	8	
IH	DT - RB	PP	0.0000508	Transformed t-test	15	***
IH	DT - RB	HR	0.4189483	t-test	11	
IH	DT - RB	BR	0.3327191	t-test	15	
IH	DT - RB	N.EDA	0.2217029	Transformed t-test	8	
IH	DT - RB	N.HR	0.2221391	Transformed t-test	8	
IH	DT - WB	PP	0.1069883	Transformed t-test	15	
IH	DT - WB	HR	0.0053983	t-test	11	**
IH	DT - WB	BR	0.0007475	t-test	15	***
IH	DT - WB	N.EDA	0.0542093	Transformed t-test	8	
IH	DT - WB	N.HR	0.4686743	Transformed t-test	8	
IH	DT - SC	PP	0.0330821	Transformed t-test	14	*
IH	DT - SC	HR	0.0775992	t-test	11	
IH	DT - SC	BR	0.5657289	t-test	15	
IH	DT - SC	N.EDA	0.2814879	Transformed t-test	8	
IH	DT - SC	N.HR	0.3102131	Transformed t-test	8	
IH	P - RB	PP	0.0001504	Transformed t-test	15	***
IH	P - RB	HR	0.0023820	t-test	10	**
IH	P - RB	BR	0.0545015	t-test	15	
IH	P - RB	N.EDA	0.2098217	Transformed t-test	8	
IH	P - RB	N.HR	0.1963474	Transformed t-test	8	
IH	P - WB	PP	0.0038361	Transformed t-test	15	**
IH	P - WB	HR	0.0278212	t-test	10	*
IH	P - WB	BR	0.0000461	t-test	15	***
IH	P - WB	N.EDA	0.7254665	Transformed t-test	8	

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Condition	Difference	Measure	p	Test	n	Significance
IH	P - WB	N.HR	0.5161270	Transformed t-test	8	
IH	P - SC	PP	0.0011403	Transformed t-test	14	**
IH	P - SC	HR	0.0051203	t-test	10	**
IH	P - SC	BR	0.0007951	t-test	15	***
IH	P - SC	N.EDA	0.4208914	Transformed t-test	8	
IH	P - SC	N.HR	0.1364381	Transformed t-test	8	
IH	P - DT	PP	0.0049034	Transformed t-test	15	**
IH	P - DT	HR	0.0014824	t-test	10	**
IH	P - DT	BR	0.0005062	t-test	15	***
IH	P - DT	N.EDA	0.4616190	Transformed t-test	8	
IH	P - DT	N.HR	0.0085617	Transformed t-test	8	**
IL	WB - RB	PP	0.0006949	Transformed t-test	13	***
IL	WB - RB	HR	0.0444250	t-test	14	*
IL	WB - RB	BR	0.0021295	t-test	14	**
IL	WB - RB	N.EDA	0.3262557	Transformed t-test	8	
IL	WB - RB	N.HR	0.9101562	Wilcoxon	9	
IL	SC - RB	PP	0.0290865	Transformed t-test	13	*
IL	SC - RB	HR	0.4521805	t-test	14	
IL	SC - RB	BR	0.6181948	t-test	15	
IL	SC - RB	N.EDA	0.8310885	Transformed t-test	8	
IL	SC - RB	N.HR	1.0000000	Wilcoxon	9	
IL	SC - WB	PP	0.0112593	Transformed t-test	13	*
IL	SC - WB	HR	0.0000816	t-test	14	***
IL	SC - WB	BR	0.0004476	t-test	14	***
IL	SC - WB	N.EDA	0.3205288	Transformed t-test	8	
IL	SC - WB	N.HR	0.2500000	Wilcoxon	9	
IL	DT - RB	PP	0.0000127	Transformed t-test	13	***
IL	DT - RB	HR	0.9350998	t-test	14	
IL	DT - RB	BR	0.0105619	t-test	15	*
IL	DT - RB	N.EDA	0.7090759	Transformed t-test	8	
IL	DT - RB	N.HR	0.7343750	Wilcoxon	9	
IL	DT - WB	PP	0.5015041	Transformed t-test	13	
IL	DT - WB	HR	0.0079476	t-test	14	**
IL	DT - WB	BR	0.0035452	t-test	14	**
IL	DT - WB	N.EDA	0.3024548	Transformed t-test	8	
IL	DT - WB	N.HR	0.0976562	Wilcoxon	9	
IL	DT - SC	PP	0.0005877	Transformed t-test	13	***
IL	DT - SC	HR	0.4751496	t-test	14	
IL	DT - SC	BR	0.0057118	t-test	15	**
IL	DT - SC	N.EDA	0.7364380	Transformed t-test	8	
IL	DT - SC	N.HR	0.5703125	Wilcoxon	9	
IL	P - RB	PP	0.0001712	Transformed t-test	11	***
IL	P - RB	HR	0.0552440	t-test	11	
IL	P - RB	BR	0.6683606	t-test	12	
IL	P - RB	N.EDA	0.2730305	Transformed t-test	7	
IL	P - RB	N.HR	0.4609375	Wilcoxon	8	
IL	P - WB	PP	0.0077659	Transformed t-test	11	**

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Condition	Difference	Measure	p	Test	n	Significance
IL	P - WB	HR	0.0985952	t-test	11	
IL	P - WB	BR	0.0000690	t-test	11	***
IL	P - WB	N.EDA	0.1214165	Transformed t-test	7	
IL	P - WB	N.HR	0.1953125	Wilcoxon	8	
IL	P - SC	PP	0.0002828	Transformed t-test	11	***
IL	P - SC	HR	0.0186726	t-test	11	*
IL	P - SC	BR	0.6101495	t-test	12	
IL	P - SC	N.EDA	0.2935919	Transformed t-test	7	
IL	P - SC	N.HR	0.9453125	Wilcoxon	8	
IL	P - DT	PP	0.0023605	Transformed t-test	11	**
IL	P - DT	HR	0.0090699	t-test	11	**
IL	P - DT	BR	0.0000458	t-test	12	***
IL	P - DT	N.EDA	0.0721371	Transformed t-test	8	
IL	P - DT	N.HR	0.7421875	Wilcoxon	8	