Advanced Analysis

For PP:

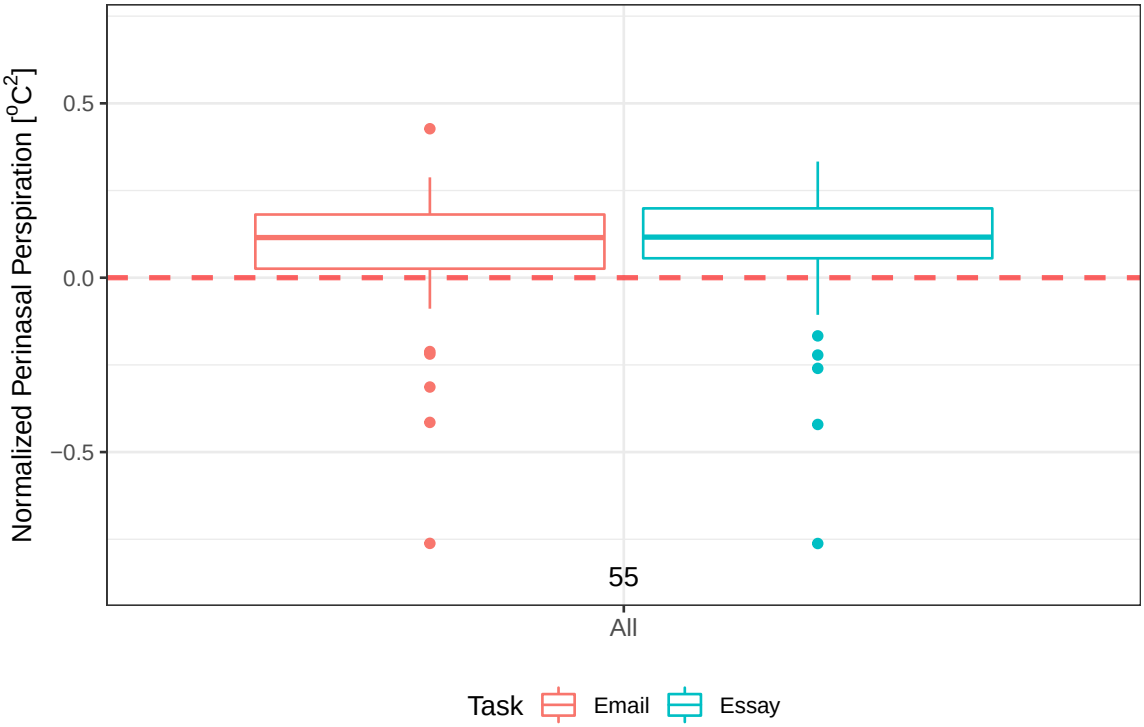
Linear Modelling

Our Linear Model:

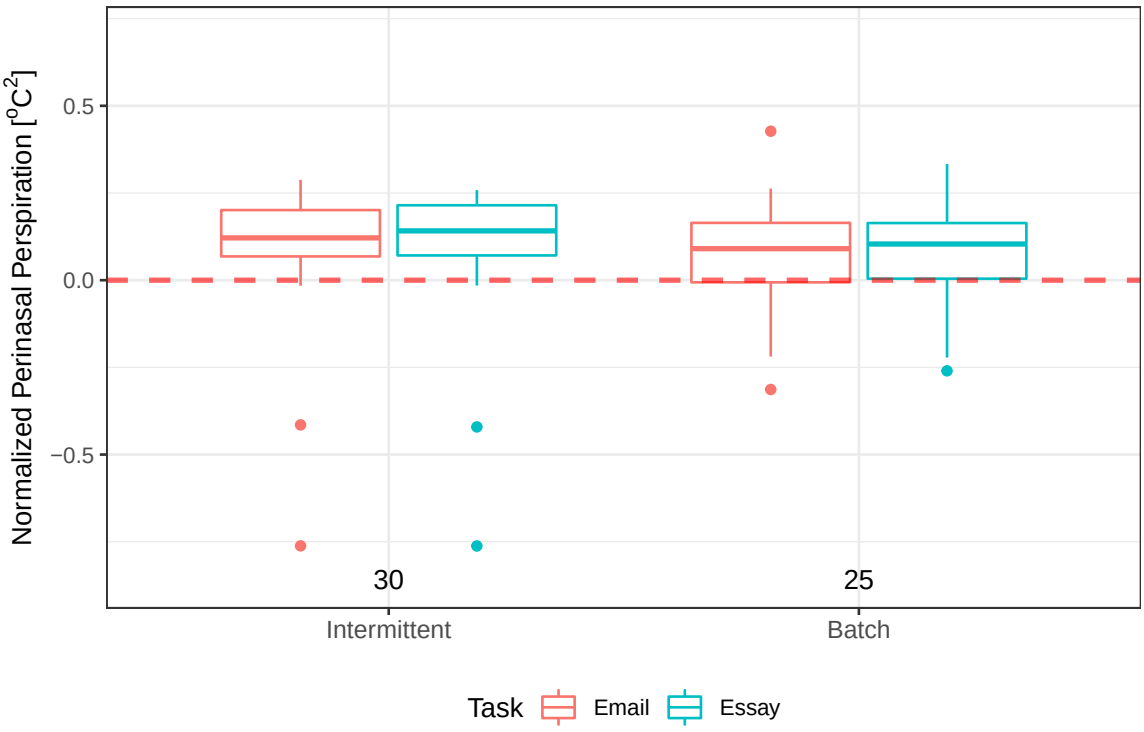
$$\Delta ln(\bar{PP}) = 1 + Group + Activity + 1|Subject$$

```
## Linear mixed-effects model fit by REML
##  Data: diff_df
##        AIC      BIC    logLik
##   522.5382 550.7604 -252.2691
##
## Random effects:
##  Formula: ~1 | Subject
##         (Intercept)  Residual
## StdDev:   0.4262572 0.9185826
##
## Fixed effects: PP ~ 1 + Group + Session
##                  Value Std.Error  DF    t-value p-value
## (Intercept) -3.1552128 0.2481390 122 -12.715507  0.0000
## GroupIL      0.7739256 0.2819071  48   2.745322  0.0085
## GroupBH      0.4439734 0.2803658  48   1.583551  0.1199
## GroupIH      0.1800706 0.2740960  48   0.656962  0.5143
## SessionSC   -0.0376369 0.2043243 122  -0.184202  0.8542
## SessionDT    0.7090947 0.1937743 122   3.659386  0.0004
## SessionP     1.5158512 0.1891377 122   8.014536  0.0000
##  Correlation:
##           (Intr) GropIL GropBH GropIH SssnSC SssnDT
## GroupIL   -0.685
## GroupBH   -0.678  0.591
## GroupIH   -0.704  0.606  0.607
## SessionSC -0.365  0.009 -0.009  0.023
## SessionDT -0.394  0.017  0.026  0.017  0.458
## SessionP  -0.426  0.054  0.017  0.047  0.472  0.493
##
## Standardized Within-Group Residuals:
##         Min          Q1         Med          Q3         Max
## -5.80088500 -0.28824758  0.09178099  0.59028149  1.97448652
##
## Number of Observations: 177
## Number of Groups: 52
```

PP Measures for Emails vs Essay Writing

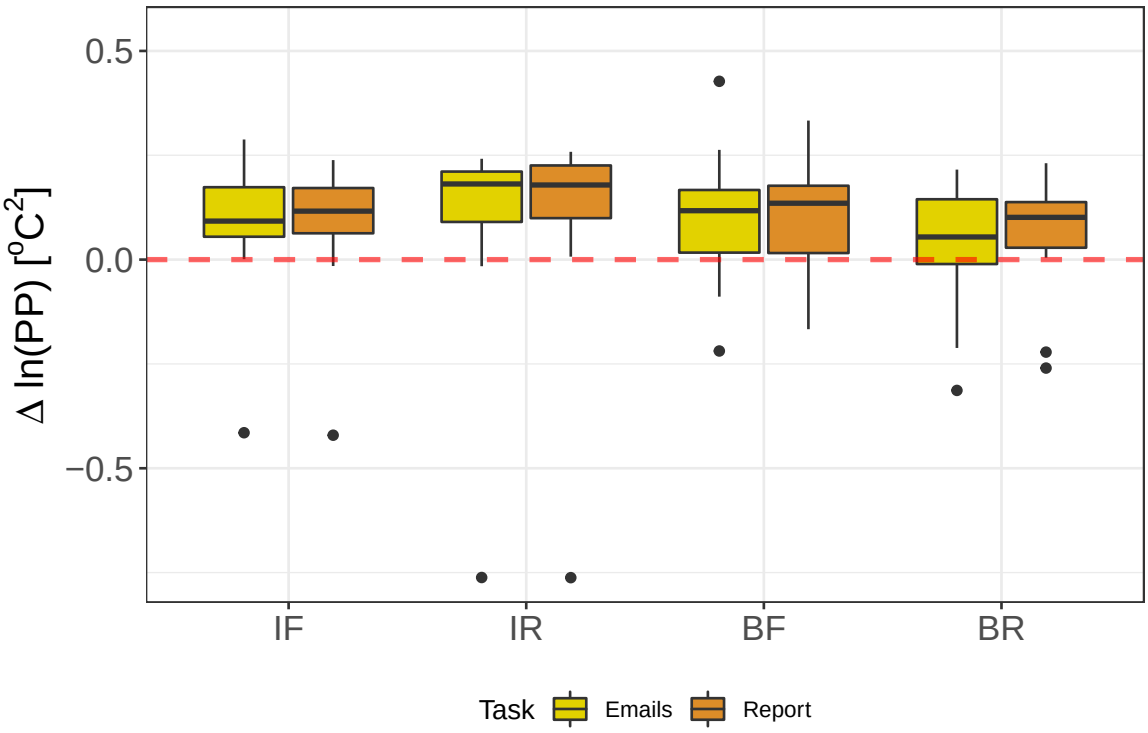



```
## Paired t-test
## For all groups, p = 0.0701 > 0.05
```




```
## Paired t-test
## For Intermittent, p = 0.059 > 0.05

## Paired t-test
## For Batch, p = 0.2825 > 0.05
```




```
## Paired t-test
## For IH, p = 0.3985 > 0.05

## Paired t-test
## For IL, p = 0.0833 > 0.05

## Paired t-test
## For BH, p = 0.7465 > 0.05

## Paired t-test
## For BL, p = 0.2322 > 0.05
```

More Linear Modelling

Our Linear Model:

$$\Delta ln(\bar{PP}) = 1 + Group + DualTask + 1|Subject$$

```
## Linear mixed-effects model fit by REML
##  Data: total_df
##         AIC       BIC   logLik
##   -186.5831 -168.0054 100.2916
##
## Random effects:
##  Formula: ~1 | Subject
##         (Intercept)   Residual
## StdDev:   0.1840821 0.03005808
##
## Fixed effects: PP ~ 1 + Group + DualTask
##                     Value  Std.Error DF   t-value p-value
## (Intercept)   0.03451477 0.05594502 54 0.6169408  0.5399
## GroupIL       0.05675431 0.07466152 51 0.7601547  0.4507
## GroupBH       0.06040041 0.07466152 51 0.8089898  0.4223
## GroupIH       0.04640600 0.07257930 51 0.6393835  0.5254
## DualTaskEssay 0.01059298 0.00573185 54 1.8480908  0.0701
##  Correlation:
##               (Intr) GropIL GropBH GropIH
## GroupIL       -0.747
## GroupBH       -0.747  0.560
## GroupIH       -0.769  0.576  0.576
## DualTaskEssay -0.051  0.000  0.000  0.000
##
## Standardized Within-Group Residuals:
##         Min          Q1         Med          Q3         Max
## -2.62805780 -0.31331023  0.01061954  0.30509361  2.65397585
##
## Number of Observations: 110
## Number of Groups: 55
```

For HR:

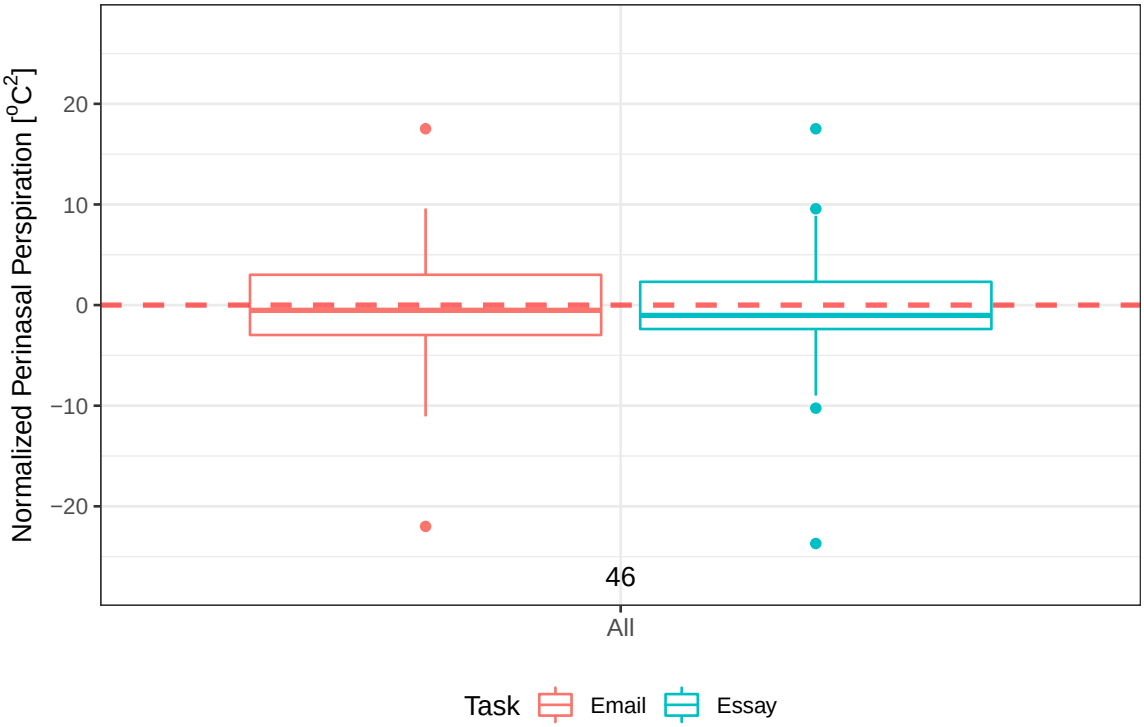
Linear Modelling

Our Linear Model:

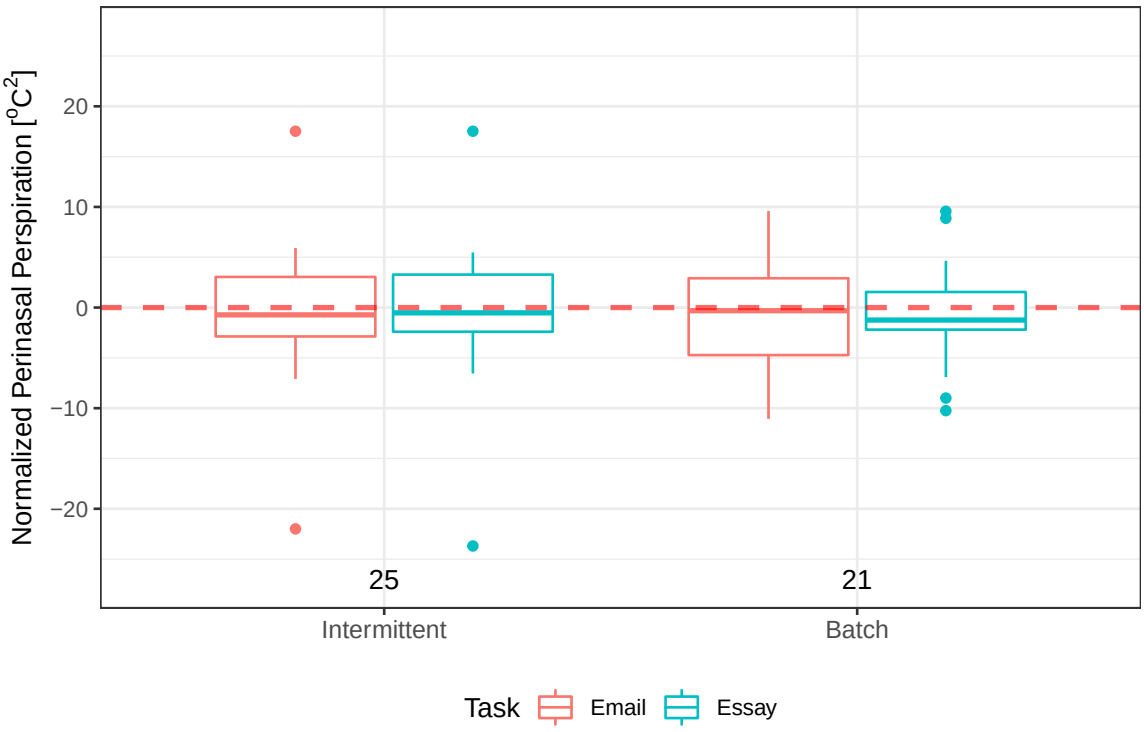
$$\Delta HR = 1 + Group + Session + 1|Subject$$

```
## Linear mixed-effects model fit by REML
##  Data: diff_df
##        AIC      BIC   logLik
##   1194.316 1222.952 -588.158
##
## Random effects:
##  Formula: ~1 | Subject
##         (Intercept) Residual
## StdDev:    4.647123 5.180994
##
## Fixed effects: HR ~ 1 + Group + Session
##                 Value Std.Error  DF   t-value p-value
## (Intercept) -0.464407  2.001282 136 -0.232055  0.8168
## GroupIL      3.688514  2.406642  42  1.532639  0.1329
## GroupBH      0.737233  2.374532  42  0.310475  0.7577
## GroupIH      3.857014  2.479613  42  1.555490  0.1273
## SessionSC   -2.321467  1.062063 136 -2.185809  0.0305
## SessionDT   -2.867565  1.046719 136 -2.739575  0.0070
## SessionP     4.766576  1.119223 136  4.258828  0.0000
##  Correlation:
##           (Intr) GropIL GropBH GropIH SssnSC SssnDT
## GroupIL   -0.748
## GroupBH   -0.757  0.631
## GroupIH   -0.727  0.604  0.612
## SessionSC -0.263  0.000  0.000  0.010
## SessionDT -0.262  0.000  0.000  0.000  0.493
## SessionP  -0.240 -0.001 -0.014 -0.009  0.468  0.468
##
## Standardized Within-Group Residuals:
##         Min          Q1         Med          Q3         Max
## -3.56781671 -0.49803799 -0.01804003  0.41408996  5.30849407
##
## Number of Observations: 185
## Number of Groups: 46
```

HR Measures for Emails vs Essay Writing

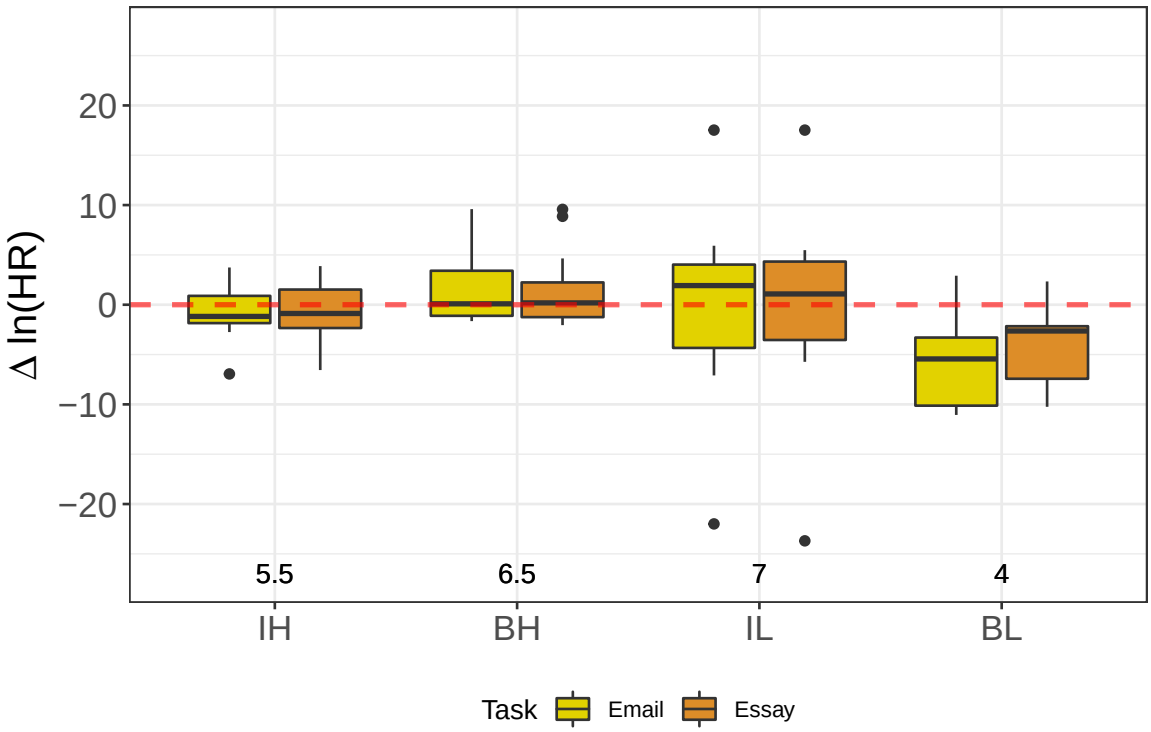



```
## Paired t-test
## For all groups, p = 0.1945 > 0.05
```




```
## Paired t-test
## For Intermittent, p = 0.5442 > 0.05

## Paired t-test
## For Batch, p = 0.2583 > 0.05
```




```
## Paired t-test
## For IH, p = 0.6292 > 0.05

## Paired t-test
## For BH, p = 0.9024 > 0.05

## Paired t-test
## For IL, p = 0.72 > 0.05

## Paired t-test
## For BL, p = 0.165 > 0.05
```

More Linear Modelling

Our Linear Model:

$$\Delta HR = 1 + Group + DualTask + 1|Subject$$

```
## Linear mixed-effects model fit by REML
##  Data: total_df
##        AIC      BIC    logLik
##   463.4833 480.7447 -224.7417
##
## Random effects:
##  Formula: ~1 | Subject
##         (Intercept) Residual
## StdDev:    5.722486 1.124413
##
## Fixed effects: HR ~ 1 + Group + DualTask
##                   Value Std.Error DF   t-value p-value
## (Intercept)   -4.926985 2.0460002 45 -2.408106  0.0202
## GroupIL        4.673732 2.5605836 42  1.825260  0.0751
## GroupBH        6.288576 2.5961489 42  2.422271  0.0198
## GroupIH        4.096491 2.6845537 42  1.525949  0.1345
## DualTaskEssay  0.308811 0.2344563 45  1.317138  0.1945
##  Correlation:
##               (Intr) GropIL GropBH GropIH
## GroupIL       -0.796
## GroupBH       -0.786  0.628
## GroupIH       -0.760  0.607  0.599
## DualTaskEssay -0.057  0.000  0.000  0.000
##
## Standardized Within-Group Residuals:
##         Min          Q1         Med          Q3         Max
## -1.79662615 -0.42177684 -0.01583117  0.51089481  1.96793109
##
## Number of Observations: 92
## Number of Groups: 46
```