Torpor MR and IR Tables

Anusha Shankar

12/1/2021

library(here)

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

## here() starts at C:/Users/nushi/OneDrive/TorporFieldwork\_Respirometry/Data\_processed/Code\_TorporMetab\_IR

library(plyr) ## for gls model to compare them with lmer, account for autocorrelation

##   
## Attaching package: 'plyr'

## The following object is masked from 'package:here':  
##   
## here

library(emmeans)

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

library(sjPlot) ## To print results

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

library(sjmisc) ## To print results

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

library(sjlabelled) ## To print results

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

#library(MASS) ## To check the distribution of the data and run glm.nb  
#getwd()  
here <- here::here  
AllDatCateg <- read.csv(here("..", "MR\_IR\_Merged\_EEJpermin.csv"))  
  
AllDatCateg$Category <- factor(AllDatCateg$Category, levels=c("Normothermic", "Transition", "DeepTorpor"))  
  
## Adding a squared term just for the transition category  
AllDatCateg$EE\_J2 <- 0  
AllDatCateg$EE\_J2[AllDatCateg$Category=="Transition"] <- (AllDatCateg$EE\_J[AllDatCateg$Category=="Transition"])^2  
  
  
## Trying lm's with plyr  
# Break up data frame by Category, then fit the specified model to each piece and  
# return a list  
models <- dlply(AllDatCateg, "Category", function(df)   
 lm(Ts\_max ~ EE\_J + EE\_J2, data = df))  
  
# Apply coef to each model and return a data frame  
mod\_coef <- ldply(models, coef)  
  
# Print the summary of each model  
mod\_print <- l\_ply(models, summary, .print = TRUE)

##   
## Call:  
## lm(formula = Ts\_max ~ EE\_J + EE\_J2, data = df)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -4.2781 -1.2947 -0.0089 1.2500 4.6208   
##   
## Coefficients: (1 not defined because of singularities)  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 33.99976 0.18738 181.452 <2e-16 \*\*\*  
## EE\_J 0.27083 0.02762 9.805 <2e-16 \*\*\*  
## EE\_J2 NA NA NA NA   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 1.787 on 390 degrees of freedom  
## (3 observations deleted due to missingness)  
## Multiple R-squared: 0.1978, Adjusted R-squared: 0.1957   
## F-statistic: 96.14 on 1 and 390 DF, p-value: < 2.2e-16  
##   
##   
## Call:  
## lm(formula = Ts\_max ~ EE\_J + EE\_J2, data = df)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -5.4380 -1.5288 -0.1928 0.9935 10.1322   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 20.79701 0.59492 34.957 < 2e-16 \*\*\*  
## EE\_J 4.38495 0.50744 8.641 9.7e-15 \*\*\*  
## EE\_J2 -0.29348 0.08364 -3.509 0.000601 \*\*\*  
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 2.636 on 144 degrees of freedom  
## Multiple R-squared: 0.7519, Adjusted R-squared: 0.7485   
## F-statistic: 218.2 on 2 and 144 DF, p-value: < 2.2e-16  
##   
##   
## Call:  
## lm(formula = Ts\_max ~ EE\_J + EE\_J2, data = df)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -1.7268 -0.9109 0.1229 0.6306 2.2503   
##   
## Coefficients: (1 not defined because of singularities)  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) 16.5002 0.6145 26.852 1.19e-10 \*\*\*  
## EE\_J 3.3948 0.7329 4.632 0.000933 \*\*\*  
## EE\_J2 NA NA NA NA   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 1.201 on 10 degrees of freedom  
## Multiple R-squared: 0.6821, Adjusted R-squared: 0.6503   
## F-statistic: 21.46 on 1 and 10 DF, p-value: 0.0009333

# em <- emmeans(mod\_cor, ~Species:Category)  
# acf(resid(mod\_cor))  
knitr::kable(mod\_coef, digits=2)

| Category | (Intercept) | EE\_J | EE\_J2 |
| --- | --- | --- | --- |
| Normothermic | 34.0 | 0.27 | NA |
| Transition | 20.8 | 4.38 | -0.29 |
| DeepTorpor | 16.5 | 3.39 | NA |

tab\_model(models, digits=2)

## Warning: Model matrix is rank deficient. Parameters EE\_J2 were not estimable.

## Warning: Model matrix is rank deficient. Parameters EE\_J2 were not estimable.

Ts max

Ts max

Ts max

Predictors

Estimates

CI

p

Estimates

CI

p

Estimates

CI

p

(Intercept)

34.00

33.63 – 34.37

<0.001

20.80

19.62 – 21.97

<0.001

16.50

15.13 – 17.87

<0.001

EE\_J

0.27

0.22 – 0.33

<0.001

4.38

3.38 – 5.39

<0.001

3.39

1.76 – 5.03

0.001

EE\_J2

-0.29

-0.46 – -0.13

0.001

Observations

392

147

12

R2 / R2 adjusted

0.198 / 0.196

0.752 / 0.748

0.682 / 0.650

#knitr::kable(intervals(mod\_cor)$fixed, digits=2)  
#knitr::kable(summary(mod\_cor)$tTable, digits = c(2,2,0,2,35))