Modeling Flight Response Summary File

Data Cleaning And Exploration

Read Libraries

```r
library(lme4) # fit regressions
library(rethinking) # Bayesian data analysis and plotting
library(popbio) # logistic regression plotting
#library(dplyr) # data manipulation
#library(ggformula) # ggplot plotting
#library(cowplot) # ggplot helper functions to arrange multi-panel figures
```

Read Source Files

```r
source_path = paste0(dir,"/Rsrc/")

script_names = c("center_flight_data.R", # 1 function: center_data()
                 "clean_flight_data.R", # 1 function: clean_flight_data()
                 "unique_flight_data.R", # 1 function: create_delta_data()
                 "compare_models.R", # 1 function: model_comparisonsAIC()
                 "AICprobabilities.R") # 1 function: AICprobs()

for (script in script_names) {
  path = paste0(source_path, script)
  source(path)
}
```

Read the Data

```r
data <- read_flight_data("data/all_flight_data-Winter2020.csv")
data_all <- data[[1]]
data_tested <- data[[2]]
d <- create_delta_data(data_tested, tested_more_than_once=FALSE)
```

Repeating Plot Parameters & Functions

```r
# scale/magnifications

c1 = 1.5 # size of points
c2 = 1.2 # size of text
c3 = 2 # size of title

# compute confidence interval
get_CI = function(x,y,m) {
  x.seq = seq(min(x) - sd(x), max(x) + sd(x), length.out=100)
```
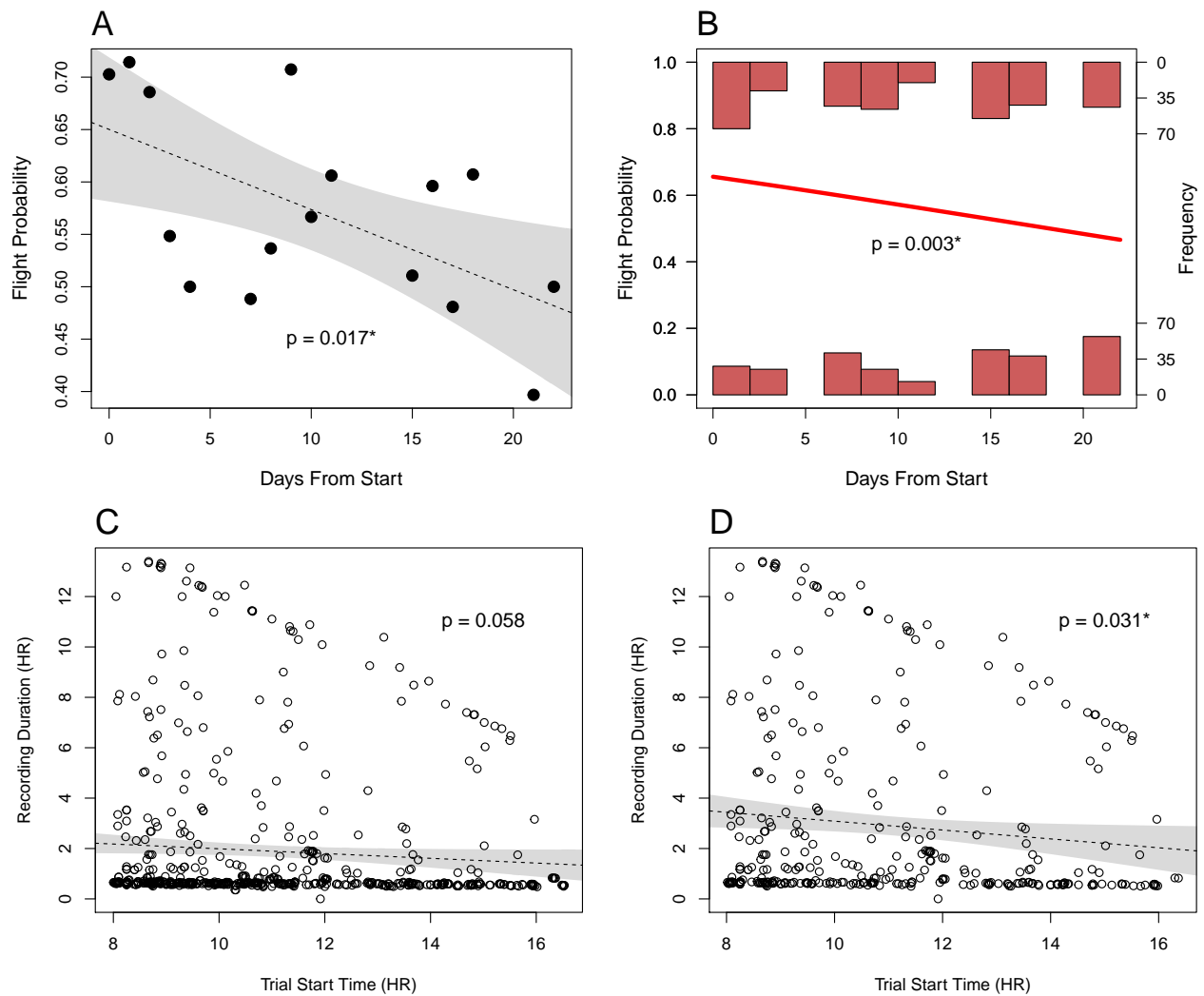
```
  prd <- data.frame(x=x.seq) # newdata
  err <- predict(m, newdata = prd, se.fit = TRUE)
  prd$lci <- err$fit - 1.96 * err$se.fit
  prd$fit <- err$fit
  prd$uci <- err$fit + 1.96 * err$se.fit
  mu_ci <- t(matrix(c(prd$lci,prd$uci), ncol=2))
  return(list(mu_ci, prd))
}
```

Across-Trial Flight Response

Experimental Effects


```
# repeating plotting features

## tailoring variables for plotting
# d$mass_block<-round(d$average_mass/0.005)*0.005
# d$wing2body_block<-round(d$wing2body, digits=2)
# d$days_block<-round(d$avg_days, digits=0)
```

```r
# group by sex and re-center
# data_fem <- d[d$sex=="F",]
# data_male <- d[d$sex=="M",]
# data_fem <- center_data(data_fem, is_not_binded = FALSE)
# data_male <- center_data(data_male, is_not_binded = FALSE)
#
# # sex vs. flight prob
# data_temp <- aggregate(flew_prob~sex, data=d, FUN=mean)
# data_temp$trials <-c(sum(d$num_flew[d$sex=="F"]+d$num_notflew[d$sex=="F"]), sum(d$num_flew[d$sex=="M"]
# #data_temp$CI <- aggregate(flew_prob~sex, data=d, FUN=function(x) qnorm(0.975)*sd(x)/length(x))$flew_
#
# # calculate binomial confidence interval
# data_temp$successes <- c(sum(d$num_flew[d$sex=="F"]), sum(d$num_flew[d$sex=="M"]))
# data_temp$CI<-binom.confint(data_temp$successes, data_temp$trials, methods="exact")
```