Comparative Cognition Numerosity Cowlog Analysis

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R Markdown This script is designed to take individual Cowlog score sheets of numerosity videos and interpret data for each video as well as summary performance stats for each fish.

The cowlog sheets should be named in the following format:

compcog\_num\_AK\_wendy\_9\_1\_9\_12\_R\_75\_2017-11-17T225557\_738.csv (experiment\_assay\_scorerinitials\_fishname\_day\_trial\_rightscreen#\_leftscreen#\_correctside\_ratio\_timestamp.csv)

time code class 0.015 top left thigmo 1 6.875 center 1 8.475 top mirror 1 12.475 top right thigmo 1 13.275 center 1

## OUTLINE OF THIS SCRIPT

STEP 1: Setup your environment and import your dataframes 1a. load relevant packages 1b. list the files you’re going to analyze 1c. make an empty dataframe that you’ll fill with data

STEP 2: Get data about proportion time the fish spent in each zone from T30-T50! 2a. Get data about time spent in each zone 2b. determine which zone is “correct” versus “incorrect”" and get proportion time in those zones 2c. get trial ID column

STEP 3: Get performance Data for each video 3a. Proportion time in correct screen / (proportion time in correct screen+ proportion time in incorrect screen) 3b. Was this performance greater than 60%? Yes or no

Step 4: Get Latency to enter zones data 4a. Latency to react to screen (i.e. move to any zone after T30) 4b. Latency to enter correct side and incorrect side 4c. remove video if latency to enter correct or incorrect side = 0 i.e. fish was already there 4d. Determine which side was entered first (correct or incorrect)

Step 5: Export as a csv file

Step 6: Get a summary per fish- Record keeping of how many testing trials were available to analyze 6a. make new summary empty data frame 6b. How many 1:2 trials were analyzed? 6c. How many 2:3 trials were analyzed? 6d. How many 3:4 trials were analyzed? 6e. How many total testing trials were analyzed?

Step 7. Get a summary per fish of performance i.e. Etheredge et al 7a. Determine median performance on 1:2 ratio 7b. Determine median performance on 2:3 ratio 7c. Determine median performance on 3:4 ratio 7d. Determine average performance 7e. Determine how many median scores (of 3) are above 60% 7f. Determine if average perofrmance is significantly different from 50% 7g. Determine learning status (high, low, non)

Step 8: Determine “new” learning criterion (note- 7 learned trials in a row) 8a. Sort the import df (earlier spreadsheet) by day then trial 8b. filter by fishname 8c. find longest row of consecutive ‘yes’ and add that as “longest streak” 8d. Is longest streak 7 or greater?

Step 9: Export as a csv file

#Step 1a. load relevant packages  
  
library(ggplot2)  
library(dplyr)

##   
## Attaching package: 'dplyr'

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

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

library(rmarkdown)  
library(knitr)  
library(readr)  
library(utils)

#Step 1b. list the file's you're going to analyze  
  
file\_list <- list.files("C:/Users/Kelly/Desktop/Grad School/Cummings Lab/Comparative Cognition/numerosity cc score sheets", pattern = "\*.csv")

#Step 1c. make an empty dataframe that you'll fill with data  
  
test\_column <- vector(length = length(file\_list))  
  
df <- data.frame(total = test\_column)

#2a. Get data about proportion time spent in each zone  
  
for(i in 1:length(file\_list)){  
 setwd("C:/Users/Kelly/Desktop/Grad School/Cummings Lab/Comparative Cognition/numerosity cc score sheets")  
   
 fil <- read\_csv(file\_list[i], col\_names = TRUE, col\_types = NULL)  
 filename <- file\_list[i]  
 filename<-strsplit(filename, ".csv")[[1]][1]  
 filename   
 filename.experiment<-strsplit(filename, "\_")[[1]][1]  
 filename.experiment  
 filename.assay<-strsplit(filename, "\_")[[1]][2]  
 filename.assay  
 filename.scorername<-strsplit(filename, "\_")[[1]][3]  
 filename.scorername  
 filename.fishname<-strsplit(filename, "\_")[[1]][4]  
 filename.fishname<-gsub(" ", "", filename.fishname)  
 filename.fishname  
 filename.day<-strsplit(filename, "\_")[[1]][5]  
 filename.day  
 filename.trial<-strsplit(filename, "\_")[[1]][6]  
 filename.trial  
 filename.rightstim<-strsplit(filename, "\_")[[1]][7]  
 filename.rightstim  
 filename.leftstim<-strsplit(filename, "\_")[[1]][8]  
 filename.leftstim  
 filename.correctside<-strsplit(filename, "\_")[[1]][9]  
 filename.correctside  
 filename.ratio<-strsplit(filename, "\_")[[1]][10]  
 filename.ratio  
 filename.sex<-strsplit(filename, "\_")[[1]][11]  
 filename.sex  
 filename.stdlength<-strsplit(filename, "\_")[[1]][12]  
 filename.stdlength  
 filename.round<-strsplit(filename, "\_")[[1]][13]  
 filename.round  
 filename.schedule<-strsplit(filename, "\_")[[1]][14]  
 filename.schedule  
 filename.order<-strsplit(filename, "\_")[[1]][15]  
 filename.order  
 filename.scoredate<-strsplit(filename, "\_")[[1]][16]  
 filename.scoredate  
   
   
 filename.vidID<-combine(filename.fishname, filename.assay, filename.day, filename.trial)  
 filename.vidID<-paste(filename.vidID, collapse="")  
 filename.vidID  
   
 fil$code<-gsub(" ", "", fil$code)  
 fil$code<-tolower(fil$code)  
   
   
 change\_index <- which(fil$time > 30)[1]-1  
 fil$time[change\_index]<- 30  
 fil<-filter(fil, time >= 30)  
 fil.entries<-nrow(fil)  
   
 #change\_index2<- which(fil$time >=50)[1]  
 #fil$time[change\_index2]<- 50  
   
 #fil<-filter(fil, time <= 50)  
 fil<-mutate(fil, time.difference = -(time -lead(time)))  
 #fil$time.difference <- replace(fil$time.difference, c(1), (fil$time[2])) use only if you're starting at time = 0 seconds  
   
 fil.end<-fil[fil$code == "end",]  
 fil.center<-fil[fil$code == "center",]  
 fil.leftscreen<-fil[fil$code == "leftscreen",]  
 fil.rightscreen<-fil[fil$code == "rightscreen",]  
 fil.topleftthigmo<-fil[fil$code == "topleftthigmo",]  
 fil.toprightthigmo<-fil[fil$code == "toprightthigmo",]  
 fil.bottomleftthigmo<-fil[fil$code == "bottomleftthigmo",]  
 fil.bottomrightthigmo<-fil[fil$code == "bottomrightthigmo",]  
 fil.topmirror<-fil[fil$code == "topmirror",]  
 fil.bottommirror<-fil[fil$code == "bottommirror",]  
   
 df$fishname[i]<-filename.fishname  
 df$fishname<-tolower(df$fishname)  
 df$sex[i]<- filename.sex  
 df$stdlength[i]<-filename.stdlength  
 df$round[i]<-filename.round  
 df$schedule[i]<-filename.schedule  
 df$order[i]<-filename.order  
 df$scoredate[i]<-filename.scoredate  
 df$ratio[i]<-filename.ratio  
 df$scorername[i]<-filename.scorername  
 df$assay[i]<-filename.assay  
 df$day[i]<-filename.day  
 df$trial[i]<-filename.trial  
 df$vidID[i]<-filename.vidID  
 df$correctside[i]<-filename.correctside  
 df$entries\_full\_4\_minutes[i]<-fil.entries -1  
 df$total[i]<-(sum(fil.end$time) - 30)  
 #df$center[i]<-sum(fil.center$time.difference) / 20  
   
   
 df$leftscreen\_full\_4\_minutes[i]<-sum(fil.leftscreen$time.difference) / (sum(fil.end$time) - 30)  
 df$rightscreen\_full\_4\_minutes[i]<-sum(fil.rightscreen$time.difference) / (sum(fil.end$time) - 30)  
   
 df$leftscreen\_full\_4\_minutes\_absolute\_seconds[i]<-sum(fil.leftscreen$time.difference)   
 df$rightscreen\_full\_4\_minutes\_absolute\_seconds[i]<-sum(fil.rightscreen$time.difference)  
   
  
 #df$topleftthigmo[i]<-sum(fil.topleftthigmo$time.difference) / 20  
 #df$toprightthigmo[i]<-sum(fil.toprightthigmo$time.difference) / 20  
 #df$bottomleftthigmo[i]<-sum(fil.bottomleftthigmo$time.difference) / 20  
 #df$bottomrightthigmo[i]<-sum(fil.bottomrightthigmo$time.difference) / 20  
 #df$topmirror[i]<-sum(fil.topmirror$time.difference) / 20  
 #df$bottommirror[i]<-sum(fil.bottommirror$time.difference) / 20  
   
 #df$center[is.na(df$center)] <- 0  
 #df$leftscreen[is.na(df$lectscreen)] <- 0  
 #df$rightscreen[is.na(df$rightscreen)] <- 0  
 #df$topleftthigmo[is.na(df$topleftthigmo)] <- 0  
 #df$toprightthigmo[is.na(df$toprightthigmo)] <- 0  
 #df$bottomleftthigmo[is.na(df$bottomleftthigmo)] <- 0  
 #df$bottomrightthigmo[is.na(df$bottomrightthigmo)] <- 0  
 #df$topmirror[is.na(df$topmirror)] <- 0  
 #df$bottomrightthigmo[is.na(df$bottomrightthigmo)] <- 0  
   
 #df$totalthigmo[i]<- (sum(fil.topleftthigmo$time.difference) + sum(fil.toprightthigmo$time.difference) + sum(fil.bottomleftthigmo$time.difference) + sum(fil.bottomrightthigmo$time.difference)) / 20  
   
 #df$totalmirror[i]<- (sum(fil.topmirror$time.difference) + sum(fil.bottommirror$time.difference)) /20  
   
 #df$totalleft[i]<- (sum(fil.leftscreen$time.difference) + sum(fil.topleftthigmo$time.difference) + sum(fil.bottomleftthigmo$time.difference))/20  
 #df$totalright[i]<- (sum(fil.rightscreen$time.difference) + sum(fil.toprightthigmo$time.difference) + sum(fil.bottomrightthigmo$time.difference))/20  
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for(i in 1:length(file\_list)){  
 setwd("C:/Users/Kelly/Desktop/Grad School/Cummings Lab/Comparative Cognition/numerosity cc score sheets")  
   
 fil <- read\_csv(file\_list[i], col\_names = TRUE, col\_types = NULL)  
 filename <- file\_list[i]  
 filename<-strsplit(filename, ".csv")[[1]][1]  
 filename   
 filename.experiment<-strsplit(filename, "\_")[[1]][1]  
 filename.experiment  
 filename.assay<-strsplit(filename, "\_")[[1]][2]  
 filename.assay  
 filename.scorername<-strsplit(filename, "\_")[[1]][3]  
 filename.scorername  
 filename.fishname<-strsplit(filename, "\_")[[1]][4]  
 filename.fishname<-gsub(" ", "", filename.fishname)  
 filename.fishname  
 filename.day<-strsplit(filename, "\_")[[1]][5]  
 filename.day  
 filename.trial<-strsplit(filename, "\_")[[1]][6]  
 filename.trial  
 filename.rightstim<-strsplit(filename, "\_")[[1]][7]  
 filename.rightstim  
 filename.leftstim<-strsplit(filename, "\_")[[1]][8]  
 filename.leftstim  
 filename.correctside<-strsplit(filename, "\_")[[1]][9]  
 filename.correctside  
 filename.ratio<-strsplit(filename, "\_")[[1]][10]  
 filename.ratio  
 filename.sex<-strsplit(filename, "\_")[[1]][11]  
 filename.sex  
 filename.stdlength<-strsplit(filename, "\_")[[1]][12]  
 filename.stdlength  
 filename.round<-strsplit(filename, "\_")[[1]][13]  
 filename.round  
 filename.schedule<-strsplit(filename, "\_")[[1]][14]  
 filename.schedule  
 filename.order<-strsplit(filename, "\_")[[1]][15]  
 filename.order  
 filename.scoredate<-strsplit(filename, "\_")[[1]][16]  
 filename.scoredate  
   
   
 filename.vidID<-combine(filename.fishname, filename.assay, filename.day, filename.trial)  
 filename.vidID<-paste(filename.vidID, collapse="")  
 filename.vidID  
   
 fil$code<-gsub(" ", "", fil$code)  
 fil$code<-tolower(fil$code)  
  
   
 change\_index <- which(fil$time > 30)[1]-1  
 fil$time[change\_index]<- 30  
 fil<-filter(fil, time >= 30)  
   
 change\_index2<- which(fil$time >=50)[1]  
 fil$time[change\_index2]<- 50  
   
 fil<-filter(fil, time <= 50)  
 fil<-mutate(fil, time.difference = -(time -lead(time, default = 50)))  
 fil.entries<-nrow(fil)  
  
 fil.end<-fil[fil$code == "end",]  
 fil.center<-fil[fil$code == "center",]  
 fil.leftscreen<-fil[fil$code == "leftscreen",]  
 fil.rightscreen<-fil[fil$code == "rightscreen",]  
 fil.topleftthigmo<-fil[fil$code == "topleftthigmo",]  
 fil.toprightthigmo<-fil[fil$code == "toprightthigmo",]  
 fil.bottomleftthigmo<-fil[fil$code == "bottomleftthigmo",]  
 fil.bottomrightthigmo<-fil[fil$code == "bottomrightthigmo",]  
 fil.topmirror<-fil[fil$code == "topmirror",]  
 fil.bottommirror<-fil[fil$code == "bottommirror",]  
  
 df$leftscreen\_T30\_to\_T50[i]<-sum(fil.leftscreen$time.difference) / 20  
 df$rightscreen\_T30\_to\_T50[i]<-sum(fil.rightscreen$time.difference) / 20  
 df$entries\_T30\_to\_T50[i]<-fil.entries -1  
   
 df$leftscreen\_T30\_to\_T50\_absolute\_seconds[i]<-sum(fil.leftscreen$time.difference)   
 df$rightscreen\_T30\_to\_T50\_absolute\_seconds[i]<-sum(fil.rightscreen$time.difference)  
}

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for(i in 1:length(file\_list)){  
 setwd("C:/Users/Kelly/Desktop/Grad School/Cummings Lab/Comparative Cognition/numerosity cc score sheets")  
   
 fil <- read\_csv(file\_list[i], col\_names = TRUE, col\_types = NULL)  
 filename <- file\_list[i]  
 filename<-strsplit(filename, ".csv")[[1]][1]  
 filename   
 filename.experiment<-strsplit(filename, "\_")[[1]][1]  
 filename.experiment  
 filename.assay<-strsplit(filename, "\_")[[1]][2]  
 filename.assay  
 filename.scorername<-strsplit(filename, "\_")[[1]][3]  
 filename.scorername  
 filename.fishname<-strsplit(filename, "\_")[[1]][4]  
 filename.fishname<-gsub(" ", "", filename.fishname)  
 filename.fishname  
 filename.day<-strsplit(filename, "\_")[[1]][5]  
 filename.day  
 filename.trial<-strsplit(filename, "\_")[[1]][6]  
 filename.trial  
 filename.rightstim<-strsplit(filename, "\_")[[1]][7]  
 filename.rightstim  
 filename.leftstim<-strsplit(filename, "\_")[[1]][8]  
 filename.leftstim  
 filename.correctside<-strsplit(filename, "\_")[[1]][9]  
 filename.correctside  
 filename.ratio<-strsplit(filename, "\_")[[1]][10]  
 filename.ratio  
 filename.sex<-strsplit(filename, "\_")[[1]][11]  
 filename.sex  
 filename.stdlength<-strsplit(filename, "\_")[[1]][12]  
 filename.stdlength  
 filename.round<-strsplit(filename, "\_")[[1]][13]  
 filename.round  
 filename.schedule<-strsplit(filename, "\_")[[1]][14]  
 filename.schedule  
 filename.order<-strsplit(filename, "\_")[[1]][15]  
 filename.order  
 filename.scoredate<-strsplit(filename, "\_")[[1]][16]  
 filename.scoredate  
   
   
 filename.vidID<-combine(filename.fishname, filename.assay, filename.day, filename.trial)  
 filename.vidID<-paste(filename.vidID, collapse="")  
 filename.vidID  
  
   
 fil$code<-gsub(" ", "", fil$code)  
 fil$code<-tolower(fil$code)  
   
   
 change\_index <- which(fil$time > 29)[1]   
 fil$time[change\_index]<- 29  
 fil<-filter(fil, time <= 29)  
 fil.entries<-nrow(fil)  
  
 fil<-mutate(fil, time.difference = -(time -lead(time, default = 29)))  
  
 fil.end<-fil[fil$code == "end",]  
 fil.center<-fil[fil$code == "center",]  
 fil.leftscreen<-fil[fil$code == "leftscreen",]  
 fil.rightscreen<-fil[fil$code == "rightscreen",]  
 fil.topleftthigmo<-fil[fil$code == "topleftthigmo",]  
 fil.toprightthigmo<-fil[fil$code == "toprightthigmo",]  
 fil.bottomleftthigmo<-fil[fil$code == "bottomleftthigmo",]  
 fil.bottomrightthigmo<-fil[fil$code == "bottomrightthigmo",]  
 fil.topmirror<-fil[fil$code == "topmirror",]  
 fil.bottommirror<-fil[fil$code == "bottommirror",]  
  
df$prop\_time\_thigmo\_T0\_to\_T29[i]<-(sum(fil.topleftthigmo$time.difference) + sum(fil.toprightthigmo$time.difference) + sum(fil.bottomleftthigmo$time.difference) + sum(fil.bottomrightthigmo$time.difference)) / 29  
df$prop\_time\_mirror\_T0\_to\_T29[i]<- (sum(fil.topmirror$time.difference) + sum(fil.bottommirror$time.difference)) / 29  
df$entries\_T0\_to\_T29[i]<-fil.entries -1   
}

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#2b. determine which zone is "correct" versus "incorrect"" and get proportion time in those zones  
  
for(i in 1:length(file\_list)){  
 if(df$correctside[i] == "R"){  
 df$correctscreen\_full\_4\_minutes[i]<-df$rightscreen\_full\_4\_minutes[i]  
 df$incorrectscreen\_full\_4\_minutes[i]<-df$leftscreen\_full\_4\_minutes[i]  
 df$correctscreen\_T30\_to\_T50[i]<-df$rightscreen\_T30\_to\_T50[i]  
 df$incorrectscreen\_T30\_to\_T50[i]<-df$leftscreen\_T30\_to\_T50[i]  
 df$correctscreen\_full\_4\_minutes\_absolute\_seconds[i]<-df$rightscreen\_full\_4\_minutes\_absolute\_seconds[i]  
 df$incorrectscreen\_full\_4\_minutes\_absolute\_seconds[i]<- df$leftscreen\_full\_4\_minutes\_absolute\_seconds[i]   
 df$correctscreen\_T30\_to\_T50\_absolute\_seconds[i]<- df$rightscreen\_T30\_to\_T50\_absolute\_seconds[i]  
 df$incorrectscreen\_T30\_to\_T50\_absolute\_seconds[i]<- df$leftscreen\_T30\_to\_T50\_absolute\_seconds[i]   
 }   
 else if(df$correctside[i] == "L"){  
 df$correctscreen\_full\_4\_minutes[i]<-df$leftscreen\_full\_4\_minutes[i]  
 df$incorrectscreen\_full\_4\_minutes[i]<-df$rightscreen\_full\_4\_minutes[i]  
 df$correctscreen\_T30\_to\_T50[i]<-df$leftscreen\_T30\_to\_T50[i]  
 df$incorrectscreen\_T30\_to\_T50[i]<-df$rightscreen\_T30\_to\_T50[i]  
 df$correctscreen\_full\_4\_minutes\_absolute\_seconds[i]<-df$leftscreen\_full\_4\_minutes\_absolute\_seconds[i]  
 df$incorrectscreen\_full\_4\_minutes\_absolute\_seconds[i]<- df$rightscreen\_full\_4\_minutes\_absolute\_seconds[i]   
 df$correctscreen\_T30\_to\_T50\_absolute\_seconds[i]<- df$leftscreen\_T30\_to\_T50\_absolute\_seconds[i]  
 df$incorrectscreen\_T30\_to\_T50\_absolute\_seconds[i]<- df$rightscreen\_T30\_to\_T50\_absolute\_seconds[i]  
 }   
 else if(df$correctside[i] == "B"){  
 #df$totalcorrect[i]<- NA  
 #df$totalincorrect[i]<-NA  
 df$correctscreen\_full\_4\_minutes[i]<-NA  
 df$incorrectscreen\_full\_4\_minutes[i]<-NA  
 df$correctscreen\_T30\_to\_T50[i]<-NA  
 df$incorrectscreen\_T30\_to\_T50[i]<-NA  
 df$correctscreen\_full\_4\_minutes\_absolute\_seconds[i]<- NA  
 df$incorrectscreen\_full\_4\_minutes\_absolute\_seconds[i]<- NA   
 df$correctscreen\_T30\_to\_T50\_absolute\_seconds[i]<- NA   
 df$incorrectscreen\_T30\_to\_T50\_absolute\_seconds[i]<- NA  
 }  
 else{  
 df$correctscreen\_full\_4\_minutes[i]<-NA  
 df$incorrectscreen\_full\_4\_minutes[i]<-NA  
 df$correctscreen\_T30\_to\_T50[i]<-NA  
 df$incorrectscreen\_T30\_to\_T50[i]<-NA  
 df$correctscreen\_full\_4\_minutes\_absolute\_seconds[i]<- NA  
 df$incorrectscreen\_full\_4\_minutes\_absolute\_seconds[i]<- NA   
 df$correctscreen\_T30\_to\_T50\_absolute\_seconds[i]<- NA   
 df$incorrectscreen\_T30\_to\_T50\_absolute\_seconds[i]<- NA  
 }  
}

#2c. get trial ID column  
  
df$trialID <- paste(df$day,df$trial, sep= "")  
#df[, c(2,12, 26)] <- sapply(df[, c(16,17, 26)], as.numeric)

#3a. Proportion time in correct screen / (proportion time in correct screen+ proportion time in incorrect screen)  
  
for(i in 1:length(file\_list)){  
 df$performancescreen\_full\_4\_minutes[i] <- (df$correctscreen\_full\_4\_minutes[i]) / (df$correctscreen\_full\_4\_minutes[i] + df$incorrectscreen\_full\_4\_minutes[i])   
 df$performancescreen\_T30\_to\_T50[i] <- (df$correctscreen\_T30\_to\_T50[i]) / (df$correctscreen\_T30\_to\_T50[i] + df$incorrectscreen\_T30\_to\_T50[i])   
 }

#3b. Was this performance greater than 60%? Yes or no  
for(i in 1:length(file\_list)){  
   
 if(is.na(df$performancescreen\_full\_4\_minutes[i]) == TRUE){  
 df$perf\_greater\_than\_60\_full\_4\_minutes[i] <- NA}   
 else if(df$performancescreen\_full\_4\_minutes[i] >= 0.6){  
 df$perf\_greater\_than\_60\_full\_4\_minutes[i] <- 1 } #yes  
 else if(df$performancescreen\_full\_4\_minutes[i] < 0.6){  
 df$perf\_greater\_than\_60\_full\_4\_minutes[i] <- 0} #no  
  
 if(is.na(df$performancescreen\_T30\_to\_T50[i]) == TRUE){  
 df$perf\_greater\_than\_60\_T30\_to\_T50[i] <- NA}   
 else if(df$performancescreen\_T30\_to\_T50[i] >= 0.6){  
 df$perf\_greater\_than\_60\_T30\_to\_T50[i] <- 1 } #yes  
 else if(df$performancescreen\_T30\_to\_T50[i] < 0.6){  
 df$perf\_greater\_than\_60\_T30\_to\_T50[i] <- 0} #no   
}

#4a. Latency to react to screen (i.e. move to any zone after T30)  
  
  
for(i in 1:length(file\_list)){  
 setwd("C:/Users/Kelly/Desktop/Grad School/Cummings Lab/Comparative Cognition/numerosity cc score sheets")  
   
 fil <- read\_csv(file\_list[i], col\_names = TRUE, col\_types = NULL)  
  
 fil$code<-gsub(" ", "", fil$code)  
 fil$code<-tolower(fil$code)  
  
   
 change\_index <- which(fil$time > 30)[1]-1  
 fil$time[change\_index]<- 30  
 fil<-filter(fil, time >= 30)  
   
 #change\_index2<- which(fil$time >=50)[1]  
 #fil$time[change\_index2]<- 50  
   
 #fil<-filter(fil, time <= 50)  
 #fil<-mutate(fil, time.difference = -(time -lead(time, default = 50)))  
  
 df$reaction\_time[i]<- ((fil$time[2]) - 30)  
}

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## cols(  
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#4b. Latency to enter correct side and incorrect side  
  
for(i in 1:length(file\_list)){   
   
 setwd("C:/Users/Kelly/Desktop/Grad School/Cummings Lab/Comparative Cognition/numerosity cc score sheets")  
   
 fil <- read\_csv(file\_list[i], col\_names = TRUE, col\_types = NULL)  
  
 fil$code<-gsub(" ", "", fil$code)  
 fil$code<-tolower(fil$code)  
 fil.entries<-nrow(fil)  
   
   
 change\_index <- which(fil$time > 30)[1]-1  
 fil$time[change\_index]<- 30  
 fil<-filter(fil, time >= 30)  
   
 #change\_index2<- which(fil$time >=50)[1]  
 #fil$time[change\_index2]<- 50  
   
 #fil<-filter(fil, time <= 50)  
 #fil<-mutate(fil, time.difference = -(time -lead(time, default = 50)))  
   
 first\_rightscreen\_index <- which(fil$code == "rightscreen")[1]  
 first\_leftscreen\_index <-which(fil$code == "leftscreen")[1]  
   
 if(df$correctside[i] == "R"){  
 df$latency\_enter\_corr[i]<- fil$time[first\_rightscreen\_index] - 30  
 df$latency\_enter\_incorr[i]<-fil$time[first\_leftscreen\_index] - 30 }  
 else if(df$correctside[i] == "L"){  
 df$latency\_enter\_corr[i]<- fil$time[first\_leftscreen\_index] - 30  
 df$latency\_enter\_incorr[i]<- fil$time[first\_rightscreen\_index] - 30}  
 else{  
 df$latency\_enter\_corr[i]<- NA  
 df$latency\_enter\_incorr[i]<- NA }  
   
#df$latency\_enter\_incorr[is.na(df$latency\_enter\_incorr)] <- 100  
#df$latency\_enter\_corr[is.na(df$latency\_enter\_corr)] <- 100  
}

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## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )

#4c/d. Determine which side was entered first (correct or incorrect) and remove latency value if latency to enter correct or incorrect side = 0 i.e. fish was already there  
  
for(i in 1:length(file\_list)){  
if(is.na(df$latency\_enter\_corr[i] < df$latency\_enter\_incorr[i]) == TRUE){  
 df$screen\_entered\_first[i]<- NA}  
else if(df$latency\_enter\_corr[i] == 0){  
 df$latency\_enter\_corr[i] <- NA  
 df$screen\_entered\_first[i]<- NA}  
else if(df$latency\_enter\_incorr[i] == 0){  
 df$latency\_enter\_incorr[i] <- NA  
 df$screen\_entered\_first[i]<- NA}   
else if((df$latency\_enter\_corr[i] < df$latency\_enter\_incorr[i]) == TRUE){  
 df$screen\_entered\_first[i]<- "correct"}  
else if((df$latency\_enter\_corr[i] < df$latency\_enter\_incorr[i]) == FALSE){  
 df$screen\_entered\_first[i]<- "incorrect"}  
}

#If fish entered the incorrect side first on a given trial, then make a new column which is latency to enter the correct side but if fish picked incorrect first the latency to enter first then latency to enter correct is NA has either latency or NA  
  
df<-mutate(df, latency\_enter\_corr\_filtered\_just\_correct\_choice = latency\_enter\_corr)  
for(i in 1:length(df)){  
 if (is.na(df$screen\_entered\_first[i]) == TRUE){  
 df$latency\_enter\_corr\_filtered\_just\_correct\_choice[i]<- df$latency\_enter\_corr\_filtered\_just\_correct\_choice[i]}  
   
 else if(df$screen\_entered\_first[i] == "incorrect"){  
 df$latency\_enter\_corr\_filtered\_just\_correct\_choice[i]<- NA}  
   
 else if(df$screen\_entered\_first[i] == "correct"){  
 df$latency\_enter\_corr\_filtered\_just\_correct\_choice[i]<- df$latency\_enter\_corr\_filtered\_just\_correct\_choice[i]}  
}

#Make a summary master data frame (df.sum), where there will be one row per form and within that row I will have both summary data and data about performance on each trial. This chunk pulls out relevant information about each trial (i.e. correct side, performance, latency to enter correct) and adds it into this summary master data frame.  
  
#From around march 5- OK so this part is a little different than the plan, hopefully I'll be able to just take pieces of this big chunk and distribute it accordingly. I'm first putting the important metric for each trial in a bunch of columns, each row being 1 fish. Then I'll get some summary stats (i.e. median performance on 75 ratio) and append those as new columns (keeping one row per fish).   
  
fish\_list<-unique(df$fishname)  
df.sum<- data.frame(fish\_name = fish\_list)  
  
  
#There are three trials in which the fish was in the correct screen at time T=30 so we can't use their performance info. I'm getting rid of those three trials manually so this should be fixed  
#The three trials are: Gideon's 10\_3, Wildflower's 10\_5, and Willis' 11\_5  
  
for(i in 1:length(fish\_list)){  
df.fish<- filter(df, fishname == fish\_list[i])  
  
if (df.fish$fishname[1] == 'gideon'){  
 df.fish$leftscreen\_full\_4\_minutes[2]<-NA  
 df.fish$rightscreen\_full\_4\_minutes[2]<-NA  
 df.fish$leftscreen\_full\_4\_minutes\_absolute\_seconds[2]<-NA  
 df.fish$rightscreen\_full\_4\_minutes\_absolute\_seconds[2]<-NA  
 df.fish$leftscreen\_T30\_to\_T50[2]<-NA  
 df.fish$rightscreen\_T30\_to\_T50[2]<-NA  
 df.fish$leftscreen\_T30\_to\_T50\_absolute\_seconds[2]<-NA  
 df.fish$rightscreen\_T30\_to\_T50\_absolute\_seconds[2]<-NA  
 df.fish$correctscreen\_full\_4\_minutes[2]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes[2]<-NA  
 df.fish$correctscreen\_T30\_to\_T50[2]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50[2]<-NA  
 df.fish$correctscreen\_full\_4\_minutes\_absolute\_seconds[2]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes\_absolute\_seconds[2]<-NA  
 df.fish$correctscreen\_T30\_to\_T50\_absolute\_seconds[2]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50\_absolute\_seconds[2]<-NA  
 df.fish$performancescreen\_full\_4\_minutes[2]<-NA  
 df.fish$performancescreen\_T30\_to\_T50[2]<-NA  
 df.fish$perf\_greater\_than\_60\_full\_4\_minutes[2]<-NA  
 df.fish$perf\_greater\_than\_60\_T30\_to\_T50[2]<-NA  
 df.fish$latency\_enter\_corr[2]<-NA  
 df.fish$latency\_enter\_incorr[2]<-NA  
 df.fish$screen\_entered\_first[2]<-NA  
 df.fish$latency\_enter\_corr\_filtered\_just\_correct\_choice[2]<-NA  
}  
  
if (df.fish$fishname[1] == 'wildflower'){  
 df.fish$leftscreen\_full\_4\_minutes[3]<-NA  
 df.fish$rightscreen\_full\_4\_minutes[3]<-NA  
 df.fish$leftscreen\_full\_4\_minutes\_absolute\_seconds[3]<-NA  
 df.fish$rightscreen\_full\_4\_minutes\_absolute\_seconds[3]<-NA  
 df.fish$leftscreen\_T30\_to\_T50[3]<-NA  
 df.fish$rightscreen\_T30\_to\_T50[3]<-NA  
 df.fish$leftscreen\_T30\_to\_T50\_absolute\_seconds[3]<-NA  
 df.fish$rightscreen\_T30\_to\_T50\_absolute\_seconds[3]<-NA  
 df.fish$correctscreen\_full\_4\_minutes[3]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes[3]<-NA  
 df.fish$correctscreen\_T30\_to\_T50[3]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50[3]<-NA  
 df.fish$correctscreen\_full\_4\_minutes\_absolute\_seconds[3]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes\_absolute\_seconds[3]<-NA  
 df.fish$correctscreen\_T30\_to\_T50\_absolute\_seconds[3]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50\_absolute\_seconds[3]<-NA  
 df.fish$performancescreen\_full\_4\_minutes[3]<-NA  
 df.fish$performancescreen\_T30\_to\_T50[3]<-NA  
 df.fish$perf\_greater\_than\_60\_full\_4\_minutes[3]<-NA  
 df.fish$perf\_greater\_than\_60\_T30\_to\_T50[3]<-NA  
 df.fish$latency\_enter\_corr[3]<-NA  
 df.fish$latency\_enter\_incorr[3]<-NA  
 df.fish$screen\_entered\_first[3]<-NA  
 df.fish$latency\_enter\_corr\_filtered\_just\_correct\_choice[3]<-NA  
}  
  
if (df.fish$fishname[1] == 'willis'){  
 df.fish$leftscreen\_full\_4\_minutes[6]<-NA  
 df.fish$rightscreen\_full\_4\_minutes[6]<-NA  
 df.fish$leftscreen\_full\_4\_minutes\_absolute\_seconds[6]<-NA  
 df.fish$rightscreen\_full\_4\_minutes\_absolute\_seconds[6]<-NA  
 df.fish$leftscreen\_T30\_to\_T50[6]<-NA  
 df.fish$rightscreen\_T30\_to\_T50[6]<-NA  
 df.fish$leftscreen\_T30\_to\_T50\_absolute\_seconds[6]<-NA  
 df.fish$rightscreen\_T30\_to\_T50\_absolute\_seconds[6]<-NA  
 df.fish$correctscreen\_full\_4\_minutes[6]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes[6]<-NA  
 df.fish$correctscreen\_T30\_to\_T50[6]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50[6]<-NA  
 df.fish$correctscreen\_full\_4\_minutes\_absolute\_seconds[6]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes\_absolute\_seconds[6]<-NA  
 df.fish$correctscreen\_T30\_to\_T50\_absolute\_seconds[6]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50\_absolute\_seconds[6]<-NA  
 df.fish$performancescreen\_full\_4\_minutes[6]<-NA  
 df.fish$performancescreen\_T30\_to\_T50[6]<-NA  
 df.fish$perf\_greater\_than\_60\_full\_4\_minutes[6]<-NA  
 df.fish$perf\_greater\_than\_60\_T30\_to\_T50[6]<-NA  
 df.fish$latency\_enter\_corr[6]<-NA  
 df.fish$latency\_enter\_incorr[6]<-NA  
 df.fish$screen\_entered\_first[6]<-NA  
 df.fish$latency\_enter\_corr\_filtered\_just\_correct\_choice[6]<-NA  
}  
  
  
df.fish$prop\_time\_thigmo\_T0\_to\_T29 <-as.numeric(df.fish$prop\_time\_thigmo\_T0\_to\_T29)  
df.fish$prop\_time\_mirror\_T0\_to\_T29 <-as.numeric(df.fish$prop\_time\_mirror\_T0\_to\_T29)  
df.fish$entries\_T0\_to\_T29 <-as.numeric(df.fish$entries\_T0\_to\_T29)  
df.fish$entries\_T30\_to\_T50 <-as.numeric(df.fish$entries\_T30\_to\_T50)  
df.fish$entries\_full\_4\_minutes <-as.numeric(df.fish$entries\_full\_4\_minutes)  
df.sum$sex[i]<-df.fish$sex[1]  
df.sum$standard\_length[i]<-df.fish$stdlength[1]  
df.sum$order[i]<- df.fish$order[1]   
df.sum$average\_prop\_time\_thigmo\_T0\_to\_T29[i]<- mean(df.fish$prop\_time\_thigmo\_T0\_to\_T29, na.rm = TRUE)  
df.sum$average\_prop\_time\_mirror\_T0\_to\_T29[i]<-mean(df.fish$prop\_time\_mirror\_T0\_to\_T29, na.rm = TRUE)  
df.sum$average\_number\_of\_entries\_T0\_to\_T29[i]<-mean(df.fish$entries\_T0\_to\_T29, na.rm = TRUE)  
df.sum$average\_number\_of\_entries\_T30\_to\_T50[i]<-mean(df.fish$entries\_T30\_to\_T50, na.rm = TRUE)  
df.sum$average\_number\_of\_entries\_full\_4\_minutes[i]<-mean(df.fish$entries\_full\_4\_minutes, na.rm = TRUE)  
}

#For each ratio, get the number of "usable trials" (i.e. where fish actually enters both sides) for full 4 minutes and T30 to T50. Then get the median performance for each ratio.   
#Note on how I'm calculating medians: if there's 3 trials in a ratio, take the median of 3. If there's only 2, take the mean of the two. If there's only 1, just take that one  
  
for(i in 1:length(fish\_list)){  
df.fish<- filter(df, fishname == fish\_list[i])  
df.fish.50<-filter(df.fish,ratio == '50')  
df.fish.67<-filter(df.fish,ratio == '67')  
df.fish.75<-filter(df.fish,ratio == '75')  
  
  
if (df.fish$fishname[1] == 'gideon'){  
 df.fish$leftscreen\_full\_4\_minutes[2]<-NA  
 df.fish$rightscreen\_full\_4\_minutes[2]<-NA  
 df.fish$leftscreen\_full\_4\_minutes\_absolute\_seconds[2]<-NA  
 df.fish$rightscreen\_full\_4\_minutes\_absolute\_seconds[2]<-NA  
 df.fish$leftscreen\_T30\_to\_T50[2]<-NA  
 df.fish$rightscreen\_T30\_to\_T50[2]<-NA  
 df.fish$leftscreen\_T30\_to\_T50\_absolute\_seconds[2]<-NA  
 df.fish$rightscreen\_T30\_to\_T50\_absolute\_seconds[2]<-NA  
 df.fish$correctscreen\_full\_4\_minutes[2]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes[2]<-NA  
 df.fish$correctscreen\_T30\_to\_T50[2]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50[2]<-NA  
 df.fish$correctscreen\_full\_4\_minutes\_absolute\_seconds[2]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes\_absolute\_seconds[2]<-NA  
 df.fish$correctscreen\_T30\_to\_T50\_absolute\_seconds[2]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50\_absolute\_seconds[2]<-NA  
 df.fish$performancescreen\_full\_4\_minutes[2]<-NA  
 df.fish$performancescreen\_T30\_to\_T50[2]<-NA  
 df.fish$perf\_greater\_than\_60\_full\_4\_minutes[2]<-NA  
 df.fish$perf\_greater\_than\_60\_T30\_to\_T50[2]<-NA  
 df.fish$latency\_enter\_corr[2]<-NA  
 df.fish$latency\_enter\_incorr[2]<-NA  
 df.fish$screen\_entered\_first[2]<-NA  
 df.fish$latency\_enter\_corr\_filtered\_just\_correct\_choice[2]<-NA  
}  
  
if (df.fish$fishname[1] == 'wildflower'){  
 df.fish$leftscreen\_full\_4\_minutes[3]<-NA  
 df.fish$rightscreen\_full\_4\_minutes[3]<-NA  
 df.fish$leftscreen\_full\_4\_minutes\_absolute\_seconds[3]<-NA  
 df.fish$rightscreen\_full\_4\_minutes\_absolute\_seconds[3]<-NA  
 df.fish$leftscreen\_T30\_to\_T50[3]<-NA  
 df.fish$rightscreen\_T30\_to\_T50[3]<-NA  
 df.fish$leftscreen\_T30\_to\_T50\_absolute\_seconds[3]<-NA  
 df.fish$rightscreen\_T30\_to\_T50\_absolute\_seconds[3]<-NA  
 df.fish$correctscreen\_full\_4\_minutes[3]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes[3]<-NA  
 df.fish$correctscreen\_T30\_to\_T50[3]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50[3]<-NA  
 df.fish$correctscreen\_full\_4\_minutes\_absolute\_seconds[3]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes\_absolute\_seconds[3]<-NA  
 df.fish$correctscreen\_T30\_to\_T50\_absolute\_seconds[3]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50\_absolute\_seconds[3]<-NA  
 df.fish$performancescreen\_full\_4\_minutes[3]<-NA  
 df.fish$performancescreen\_T30\_to\_T50[3]<-NA  
 df.fish$perf\_greater\_than\_60\_full\_4\_minutes[3]<-NA  
 df.fish$perf\_greater\_than\_60\_T30\_to\_T50[3]<-NA  
 df.fish$latency\_enter\_corr[3]<-NA  
 df.fish$latency\_enter\_incorr[3]<-NA  
 df.fish$screen\_entered\_first[3]<-NA  
 df.fish$latency\_enter\_corr\_filtered\_just\_correct\_choice[3]<-NA  
}  
  
if (df.fish$fishname[1] == 'willis'){  
 df.fish$leftscreen\_full\_4\_minutes[6]<-NA  
 df.fish$rightscreen\_full\_4\_minutes[6]<-NA  
 df.fish$leftscreen\_full\_4\_minutes\_absolute\_seconds[6]<-NA  
 df.fish$rightscreen\_full\_4\_minutes\_absolute\_seconds[6]<-NA  
 df.fish$leftscreen\_T30\_to\_T50[6]<-NA  
 df.fish$rightscreen\_T30\_to\_T50[6]<-NA  
 df.fish$leftscreen\_T30\_to\_T50\_absolute\_seconds[6]<-NA  
 df.fish$rightscreen\_T30\_to\_T50\_absolute\_seconds[6]<-NA  
 df.fish$correctscreen\_full\_4\_minutes[6]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes[6]<-NA  
 df.fish$correctscreen\_T30\_to\_T50[6]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50[6]<-NA  
 df.fish$correctscreen\_full\_4\_minutes\_absolute\_seconds[6]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes\_absolute\_seconds[6]<-NA  
 df.fish$correctscreen\_T30\_to\_T50\_absolute\_seconds[6]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50\_absolute\_seconds[6]<-NA  
 df.fish$performancescreen\_full\_4\_minutes[6]<-NA  
 df.fish$performancescreen\_T30\_to\_T50[6]<-NA  
 df.fish$perf\_greater\_than\_60\_full\_4\_minutes[6]<-NA  
 df.fish$perf\_greater\_than\_60\_T30\_to\_T50[6]<-NA  
 df.fish$latency\_enter\_corr[6]<-NA  
 df.fish$latency\_enter\_incorr[6]<-NA  
 df.fish$screen\_entered\_first[6]<-NA  
 df.fish$latency\_enter\_corr\_filtered\_just\_correct\_choice[6]<-NA  
}  
  
 df.sum$average\_performance\_across\_all\_9\_testing\_trials\_using\_full\_4\_minutes\_data[i]<- mean(df.fish$performancescreen\_full\_4\_minutes, na.rm=TRUE)  
 df.sum$average\_performance\_across\_all\_9\_testing\_trials\_using\_T30\_to\_T50\_data[i]<- mean(df.fish$performancescreen\_T30\_to\_T50, na.rm=TRUE)  
   
 df.sum$total\_number\_of\_testing\_trials\_using\_full\_4\_minutes\_data[i]<- nrow(df.fish) - sum(is.na(df.fish$performancescreen\_full\_4\_minutes))  
 df.sum$total\_number\_of\_testing\_trials\_using\_T30\_to\_T50\_data[i]<- nrow(df.fish) - sum(is.na(df.fish$performancescreen\_T30\_to\_T50))  
   
 df.sum$number\_of\_trials\_on\_0.50\_ratio\_using\_full\_4\_minutes\_data[i]<- nrow(df.fish.50) - sum(is.na(df.fish.50$performancescreen\_full\_4\_minutes))  
 df.sum$number\_of\_trials\_on\_0.67\_ratio\_using\_full\_4\_minutes\_data[i]<- nrow(df.fish.67) - sum(is.na(df.fish.67$performancescreen\_full\_4\_minutes))  
 df.sum$number\_of\_trials\_on\_0.75\_ratio\_using\_full\_4\_minutes\_data[i]<- nrow(df.fish.75) - sum(is.na(df.fish.75$performancescreen\_full\_4\_minutes))  
   
 df.sum$number\_of\_trials\_on\_0.50\_ratio\_using\_T30\_to\_T50\_data[i]<- nrow(df.fish.50) - sum(is.na(df.fish.50$performancescreen\_T30\_to\_T50))  
 df.sum$number\_of\_trials\_on\_0.67\_ratio\_using\_T30\_to\_T50\_data[i]<- nrow(df.fish.67) - sum(is.na(df.fish.67$performancescreen\_T30\_to\_T50))  
 df.sum$number\_of\_trials\_on\_0.75\_ratio\_using\_T30\_to\_T50\_data[i]<- nrow(df.fish.75) - sum(is.na(df.fish.75$performancescreen\_T30\_to\_T50))  
}  
  
  
for(i in 1:length(fish\_list)){  
df.fish<- filter(df, fishname == fish\_list[i])  
  
if (df.fish$fishname[1] == 'gideon'){  
 df.fish$leftscreen\_full\_4\_minutes[2]<-NA  
 df.fish$rightscreen\_full\_4\_minutes[2]<-NA  
 df.fish$leftscreen\_full\_4\_minutes\_absolute\_seconds[2]<-NA  
 df.fish$rightscreen\_full\_4\_minutes\_absolute\_seconds[2]<-NA  
 df.fish$leftscreen\_T30\_to\_T50[2]<-NA  
 df.fish$rightscreen\_T30\_to\_T50[2]<-NA  
 df.fish$leftscreen\_T30\_to\_T50\_absolute\_seconds[2]<-NA  
 df.fish$rightscreen\_T30\_to\_T50\_absolute\_seconds[2]<-NA  
 df.fish$correctscreen\_full\_4\_minutes[2]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes[2]<-NA  
 df.fish$correctscreen\_T30\_to\_T50[2]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50[2]<-NA  
 df.fish$correctscreen\_full\_4\_minutes\_absolute\_seconds[2]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes\_absolute\_seconds[2]<-NA  
 df.fish$correctscreen\_T30\_to\_T50\_absolute\_seconds[2]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50\_absolute\_seconds[2]<-NA  
 df.fish$performancescreen\_full\_4\_minutes[2]<-NA  
 df.fish$performancescreen\_T30\_to\_T50[2]<-NA  
 df.fish$perf\_greater\_than\_60\_full\_4\_minutes[2]<-NA  
 df.fish$perf\_greater\_than\_60\_T30\_to\_T50[2]<-NA  
 df.fish$latency\_enter\_corr[2]<-NA  
 df.fish$latency\_enter\_incorr[2]<-NA  
 df.fish$screen\_entered\_first[2]<-NA  
 df.fish$latency\_enter\_corr\_filtered\_just\_correct\_choice[2]<-NA  
}  
  
if (df.fish$fishname[1] == 'wildflower'){  
 df.fish$leftscreen\_full\_4\_minutes[3]<-NA  
 df.fish$rightscreen\_full\_4\_minutes[3]<-NA  
 df.fish$leftscreen\_full\_4\_minutes\_absolute\_seconds[3]<-NA  
 df.fish$rightscreen\_full\_4\_minutes\_absolute\_seconds[3]<-NA  
 df.fish$leftscreen\_T30\_to\_T50[3]<-NA  
 df.fish$rightscreen\_T30\_to\_T50[3]<-NA  
 df.fish$leftscreen\_T30\_to\_T50\_absolute\_seconds[3]<-NA  
 df.fish$rightscreen\_T30\_to\_T50\_absolute\_seconds[3]<-NA  
 df.fish$correctscreen\_full\_4\_minutes[3]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes[3]<-NA  
 df.fish$correctscreen\_T30\_to\_T50[3]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50[3]<-NA  
 df.fish$correctscreen\_full\_4\_minutes\_absolute\_seconds[3]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes\_absolute\_seconds[3]<-NA  
 df.fish$correctscreen\_T30\_to\_T50\_absolute\_seconds[3]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50\_absolute\_seconds[3]<-NA  
 df.fish$performancescreen\_full\_4\_minutes[3]<-NA  
 df.fish$performancescreen\_T30\_to\_T50[3]<-NA  
 df.fish$perf\_greater\_than\_60\_full\_4\_minutes[3]<-NA  
 df.fish$perf\_greater\_than\_60\_T30\_to\_T50[3]<-NA  
 df.fish$latency\_enter\_corr[3]<-NA  
 df.fish$latency\_enter\_incorr[3]<-NA  
 df.fish$screen\_entered\_first[3]<-NA  
 df.fish$latency\_enter\_corr\_filtered\_just\_correct\_choice[3]<-NA  
}  
  
if (df.fish$fishname[1] == 'willis'){  
 df.fish$leftscreen\_full\_4\_minutes[6]<-NA  
 df.fish$rightscreen\_full\_4\_minutes[6]<-NA  
 df.fish$leftscreen\_full\_4\_minutes\_absolute\_seconds[6]<-NA  
 df.fish$rightscreen\_full\_4\_minutes\_absolute\_seconds[6]<-NA  
 df.fish$leftscreen\_T30\_to\_T50[6]<-NA  
 df.fish$rightscreen\_T30\_to\_T50[6]<-NA  
 df.fish$leftscreen\_T30\_to\_T50\_absolute\_seconds[6]<-NA  
 df.fish$rightscreen\_T30\_to\_T50\_absolute\_seconds[6]<-NA  
 df.fish$correctscreen\_full\_4\_minutes[6]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes[6]<-NA  
 df.fish$correctscreen\_T30\_to\_T50[6]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50[6]<-NA  
 df.fish$correctscreen\_full\_4\_minutes\_absolute\_seconds[6]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes\_absolute\_seconds[6]<-NA  
 df.fish$correctscreen\_T30\_to\_T50\_absolute\_seconds[6]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50\_absolute\_seconds[6]<-NA  
 df.fish$performancescreen\_full\_4\_minutes[6]<-NA  
 df.fish$performancescreen\_T30\_to\_T50[6]<-NA  
 df.fish$perf\_greater\_than\_60\_full\_4\_minutes[6]<-NA  
 df.fish$perf\_greater\_than\_60\_T30\_to\_T50[6]<-NA  
 df.fish$latency\_enter\_corr[6]<-NA  
 df.fish$latency\_enter\_incorr[6]<-NA  
 df.fish$screen\_entered\_first[6]<-NA  
 df.fish$latency\_enter\_corr\_filtered\_just\_correct\_choice[6]<-NA  
}  
  
df.fish.50<-filter(df.fish,ratio == '50')  
df.fish.67<-filter(df.fish,ratio == '67')  
df.fish.75<-filter(df.fish,ratio == '75')   
if ((nrow(df.fish.50) - sum(is.na(df.fish.50$performancescreen\_full\_4\_minutes))) == 3){  
 df.sum$median\_performance\_on\_0.50\_ratio\_using\_full\_4\_minutes\_data[i]<-median(df.fish.50$performancescreen\_full\_4\_minutes)}  
else if ((nrow(df.fish.50) - sum(is.na(df.fish.50$performancescreen\_full\_4\_minutes))) == 2){   
 df.sum$median\_performance\_on\_0.50\_ratio\_using\_full\_4\_minutes\_data[i]<-mean(df.fish.50$performancescreen\_full\_4\_minutes, na.rm=TRUE)}  
else if ((nrow(df.fish.50) - sum(is.na(df.fish.50$performancescreen\_full\_4\_minutes))) == 1){  
 df.sum$median\_performance\_on\_0.50\_ratio\_using\_full\_4\_minutes\_data[i]<-mean(df.fish.50$performancescreen\_full\_4\_minutes, na.rm=TRUE)}  
else{  
 df.sum$median\_performance\_on\_0.50\_ratio\_using\_full\_4\_minutes\_data[i]<-NA}  
  
if ((nrow(df.fish.67) - sum(is.na(df.fish.67$performancescreen\_full\_4\_minutes))) == 3){  
 df.sum$median\_performance\_on\_0.67\_ratio\_using\_full\_4\_minutes\_data[i]<-median(df.fish.67$performancescreen\_full\_4\_minutes)}  
else if ((nrow(df.fish.67) - sum(is.na(df.fish.67$performancescreen\_full\_4\_minutes))) == 2){   
 df.sum$median\_performance\_on\_0.67\_ratio\_using\_full\_4\_minutes\_data[i]<-mean(df.fish.67$performancescreen\_full\_4\_minutes, na.rm=TRUE)}  
else if ((nrow(df.fish.67) - sum(is.na(df.fish.67$performancescreen\_full\_4\_minutes))) == 1){  
 df.sum$median\_performance\_on\_0.67\_ratio\_using\_full\_4\_minutes\_data[i]<-mean(df.fish.67$performancescreen\_full\_4\_minutes, na.rm=TRUE)}  
else{  
 df.sum$median\_performance\_on\_0.67\_ratio\_using\_full\_4\_minutes\_data[i]<-NA}  
  
if ((nrow(df.fish.75) - sum(is.na(df.fish.75$performancescreen\_full\_4\_minutes))) == 3){  
 df.sum$median\_performance\_on\_0.75\_ratio\_using\_full\_4\_minutes\_data[i]<-median(df.fish.75$performancescreen\_full\_4\_minutes)}  
else if ((nrow(df.fish.75) - sum(is.na(df.fish.75$performancescreen\_full\_4\_minutes))) == 2){   
 df.sum$median\_performance\_on\_0.75\_ratio\_using\_full\_4\_minutes\_data[i]<-mean(df.fish.75$performancescreen\_full\_4\_minutes, na.rm=TRUE)}  
else if ((nrow(df.fish.75) - sum(is.na(df.fish.75$performancescreen\_full\_4\_minutes))) == 1){  
 df.sum$median\_performance\_on\_0.75\_ratio\_using\_full\_4\_minutes\_data[i]<-mean(df.fish.75$performancescreen\_full\_4\_minutes, na.rm=TRUE)}  
else{  
 df.sum$median\_performance\_on\_0.75\_ratio\_using\_full\_4\_minutes\_data[i]<-NA}  
  
if ((nrow(df.fish.50) - sum(is.na(df.fish.50$performancescreen\_T30\_to\_T50))) == 3){  
 df.sum$median\_performance\_on\_0.50\_ratio\_using\_T30\_to\_T50\_data[i]<-median(df.fish.50$performancescreen\_T30\_to\_T50)}  
else if ((nrow(df.fish.50) - sum(is.na(df.fish.50$performancescreen\_T30\_to\_T50))) == 2){   
 df.sum$median\_performance\_on\_0.50\_ratio\_using\_T30\_to\_T50\_data[i]<-mean(df.fish.50$performancescreen\_T30\_to\_T50, na.rm=TRUE)}  
else if ((nrow(df.fish.50) - sum(is.na(df.fish.50$performancescreen\_T30\_to\_T50))) == 1){  
 df.sum$median\_performance\_on\_0.50\_ratio\_using\_T30\_to\_T50\_data[i]<-mean(df.fish.50$performancescreen\_T30\_to\_T50, na.rm=TRUE)}  
else{  
 df.sum$median\_performance\_on\_0.50\_ratio\_using\_T30\_to\_T50\_data[i]<-NA}  
  
if ((nrow(df.fish.67) - sum(is.na(df.fish.67$performancescreen\_T30\_to\_T50))) == 3){  
 df.sum$median\_performance\_on\_0.67\_ratio\_using\_T30\_to\_T50\_data[i]<-median(df.fish.67$performancescreen\_T30\_to\_T50)}  
else if ((nrow(df.fish.67) - sum(is.na(df.fish.67$performancescreen\_T30\_to\_T50))) == 2){   
 df.sum$median\_performance\_on\_0.67\_ratio\_using\_T30\_to\_T50\_data[i]<-mean(df.fish.67$performancescreen\_T30\_to\_T50, na.rm=TRUE)}  
else if ((nrow(df.fish.67) - sum(is.na(df.fish.67$performancescreen\_T30\_to\_T50))) == 1){  
 df.sum$median\_performance\_on\_0.67\_ratio\_using\_T30\_to\_T50\_data[i]<-mean(df.fish.67$performancescreen\_T30\_to\_T50, na.rm=TRUE)}  
else{  
 df.sum$median\_performance\_on\_0.67\_ratio\_using\_T30\_to\_T50\_data[i]<-NA}  
  
if ((nrow(df.fish.75) - sum(is.na(df.fish.75$performancescreen\_T30\_to\_T50))) == 3){  
 df.sum$median\_performance\_on\_0.75\_ratio\_using\_T30\_to\_T50\_data[i]<-median(df.fish.75$performancescreen\_T30\_to\_T50)}  
else if ((nrow(df.fish.75) - sum(is.na(df.fish.75$performancescreen\_T30\_to\_T50))) == 2){   
 df.sum$median\_performance\_on\_0.75\_ratio\_using\_T30\_to\_T50\_data[i]<-mean(df.fish.75$performancescreen\_T30\_to\_T50, na.rm=TRUE)}  
else if ((nrow(df.fish.75) - sum(is.na(df.fish.75$performancescreen\_T30\_to\_T50))) == 1){  
 df.sum$median\_performance\_on\_0.75\_ratio\_using\_T30\_to\_T50\_data[i]<-mean(df.fish.75$performancescreen\_T30\_to\_T50, na.rm=TRUE)}  
else{  
 df.sum$median\_performance\_on\_0.75\_ratio\_using\_T30\_to\_T50\_data[i]<-NA}  
}

#how many medians are above 60% using full four minutes anf T30 to 50 data.   
  
for(i in 1:length(fish\_list)){  
 print(i)  
 count = 0  
if (is.na(df.sum$median\_performance\_on\_0.50\_ratio\_using\_full\_4\_minutes\_data[i]) == TRUE){  
 count<- count}  
else if (df.sum$median\_performance\_on\_0.50\_ratio\_using\_full\_4\_minutes\_data[i] >= 0.60){  
 count<- count + 1  
 }   
   
if (is.na(df.sum$median\_performance\_on\_0.67\_ratio\_using\_full\_4\_minutes\_data[i]) == TRUE){  
 count<- count}  
else if (df.sum$median\_performance\_on\_0.67\_ratio\_using\_full\_4\_minutes\_data[i] >= 0.60){  
 count<- count + 1  
 }   
  
if (is.na(df.sum$median\_performance\_on\_0.75\_ratio\_using\_full\_4\_minutes\_data[i]) == TRUE){  
 count<- count  
 } else if (df.sum$median\_performance\_on\_0.75\_ratio\_using\_full\_4\_minutes\_data[i] >= 0.60){  
 count<- count + 1  
 }   
 df.sum$number\_of\_medians\_above\_60\_using\_full\_4\_minutes\_data[i] <- count   
}

## [1] 1  
## [1] 2  
## [1] 3  
## [1] 4  
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## [1] 34  
## [1] 35  
## [1] 36

for(i in 1:length(fish\_list)){  
 print(i)  
 count = 0  
if (is.na(df.sum$median\_performance\_on\_0.50\_ratio\_using\_T30\_to\_T50\_data[i]) == TRUE){  
 count<- count}  
  
else if (df.sum$median\_performance\_on\_0.50\_ratio\_using\_T30\_to\_T50\_data[i] >= 0.60){  
 count<- count + 1  
 }   
  
if (is.na(df.sum$median\_performance\_on\_0.67\_ratio\_using\_T30\_to\_T50\_data[i]) == TRUE){  
 count<- count}  
else if (df.sum$median\_performance\_on\_0.67\_ratio\_using\_T30\_to\_T50\_data[i] >= 0.60){  
 count<- count + 1  
 }   
  
if (is.na(df.sum$median\_performance\_on\_0.75\_ratio\_using\_T30\_to\_T50\_data[i]) == TRUE){  
 count<- count  
 } else if (df.sum$median\_performance\_on\_0.75\_ratio\_using\_T30\_to\_T50\_data[i] >= 0.60){  
 count<- count + 1  
 }   
 df.sum$number\_of\_medians\_above\_60\_using\_T30\_to\_T50\_data[i] <- count   
}

## [1] 1  
## [1] 2  
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## [1] 36

#Run the shapiro-wilk test to determine if testing trials are normally distributed or not, then using that result run either a t test of a wilcox test to see if performance was significantly from mu=0.5 for a given fish  
  
for(i in 1:length(fish\_list)){  
 df.fish<- filter(df, fishname == fish\_list[i])  
   
if (df.fish$fishname[1] == 'gideon'){  
 df.fish$leftscreen\_full\_4\_minutes[2]<-NA  
 df.fish$rightscreen\_full\_4\_minutes[2]<-NA  
 df.fish$leftscreen\_full\_4\_minutes\_absolute\_seconds[2]<-NA  
 df.fish$rightscreen\_full\_4\_minutes\_absolute\_seconds[2]<-NA  
 df.fish$leftscreen\_T30\_to\_T50[2]<-NA  
 df.fish$rightscreen\_T30\_to\_T50[2]<-NA  
 df.fish$leftscreen\_T30\_to\_T50\_absolute\_seconds[2]<-NA  
 df.fish$rightscreen\_T30\_to\_T50\_absolute\_seconds[2]<-NA  
 df.fish$correctscreen\_full\_4\_minutes[2]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes[2]<-NA  
 df.fish$correctscreen\_T30\_to\_T50[2]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50[2]<-NA  
 df.fish$correctscreen\_full\_4\_minutes\_absolute\_seconds[2]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes\_absolute\_seconds[2]<-NA  
 df.fish$correctscreen\_T30\_to\_T50\_absolute\_seconds[2]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50\_absolute\_seconds[2]<-NA  
 df.fish$performancescreen\_full\_4\_minutes[2]<-NA  
 df.fish$performancescreen\_T30\_to\_T50[2]<-NA  
 df.fish$perf\_greater\_than\_60\_full\_4\_minutes[2]<-NA  
 df.fish$perf\_greater\_than\_60\_T30\_to\_T50[2]<-NA  
 df.fish$latency\_enter\_corr[2]<-NA  
 df.fish$latency\_enter\_incorr[2]<-NA  
 df.fish$screen\_entered\_first[2]<-NA  
 df.fish$latency\_enter\_corr\_filtered\_just\_correct\_choice[2]<-NA  
}  
  
if (df.fish$fishname[1] == 'wildflower'){  
 df.fish$leftscreen\_full\_4\_minutes[3]<-NA  
 df.fish$rightscreen\_full\_4\_minutes[3]<-NA  
 df.fish$leftscreen\_full\_4\_minutes\_absolute\_seconds[3]<-NA  
 df.fish$rightscreen\_full\_4\_minutes\_absolute\_seconds[3]<-NA  
 df.fish$leftscreen\_T30\_to\_T50[3]<-NA  
 df.fish$rightscreen\_T30\_to\_T50[3]<-NA  
 df.fish$leftscreen\_T30\_to\_T50\_absolute\_seconds[3]<-NA  
 df.fish$rightscreen\_T30\_to\_T50\_absolute\_seconds[3]<-NA  
 df.fish$correctscreen\_full\_4\_minutes[3]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes[3]<-NA  
 df.fish$correctscreen\_T30\_to\_T50[3]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50[3]<-NA  
 df.fish$correctscreen\_full\_4\_minutes\_absolute\_seconds[3]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes\_absolute\_seconds[3]<-NA  
 df.fish$correctscreen\_T30\_to\_T50\_absolute\_seconds[3]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50\_absolute\_seconds[3]<-NA  
 df.fish$performancescreen\_full\_4\_minutes[3]<-NA  
 df.fish$performancescreen\_T30\_to\_T50[3]<-NA  
 df.fish$perf\_greater\_than\_60\_full\_4\_minutes[3]<-NA  
 df.fish$perf\_greater\_than\_60\_T30\_to\_T50[3]<-NA  
 df.fish$latency\_enter\_corr[3]<-NA  
 df.fish$latency\_enter\_incorr[3]<-NA  
 df.fish$screen\_entered\_first[3]<-NA  
 df.fish$latency\_enter\_corr\_filtered\_just\_correct\_choice[3]<-NA  
}  
  
if (df.fish$fishname[1] == 'willis'){  
 df.fish$leftscreen\_full\_4\_minutes[6]<-NA  
 df.fish$rightscreen\_full\_4\_minutes[6]<-NA  
 df.fish$leftscreen\_full\_4\_minutes\_absolute\_seconds[6]<-NA  
 df.fish$rightscreen\_full\_4\_minutes\_absolute\_seconds[6]<-NA  
 df.fish$leftscreen\_T30\_to\_T50[6]<-NA  
 df.fish$rightscreen\_T30\_to\_T50[6]<-NA  
 df.fish$leftscreen\_T30\_to\_T50\_absolute\_seconds[6]<-NA  
 df.fish$rightscreen\_T30\_to\_T50\_absolute\_seconds[6]<-NA  
 df.fish$correctscreen\_full\_4\_minutes[6]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes[6]<-NA  
 df.fish$correctscreen\_T30\_to\_T50[6]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50[6]<-NA  
 df.fish$correctscreen\_full\_4\_minutes\_absolute\_seconds[6]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes\_absolute\_seconds[6]<-NA  
 df.fish$correctscreen\_T30\_to\_T50\_absolute\_seconds[6]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50\_absolute\_seconds[6]<-NA  
 df.fish$performancescreen\_full\_4\_minutes[6]<-NA  
 df.fish$performancescreen\_T30\_to\_T50[6]<-NA  
 df.fish$perf\_greater\_than\_60\_full\_4\_minutes[6]<-NA  
 df.fish$perf\_greater\_than\_60\_T30\_to\_T50[6]<-NA  
 df.fish$latency\_enter\_corr[6]<-NA  
 df.fish$latency\_enter\_incorr[6]<-NA  
 df.fish$screen\_entered\_first[6]<-NA  
 df.fish$latency\_enter\_corr\_filtered\_just\_correct\_choice[6]<-NA  
}  
   
if(nrow(df.fish) - sum(is.na(df.fish$performancescreen\_full\_4\_minutes)) >2){  
 shapiro.results.full.4<- shapiro.test(df.fish$performancescreen\_full\_4\_minutes)  
 df.sum$shapiro\_wilk\_test\_p\_value\_using\_full\_4\_minutes\_data[i]<- shapiro.results.full.4$p.value}  
   
else{  
 df.sum$shapiro\_wilk\_test\_p\_value\_using\_full\_4\_minutes\_data[i]<-NA}  
}  
   
for(i in 1:length(fish\_list)){  
 df.fish<- filter(df, fishname == fish\_list[i])  
   
if (df.fish$fishname[1] == 'gideon'){  
 df.fish$leftscreen\_full\_4\_minutes[2]<-NA  
 df.fish$rightscreen\_full\_4\_minutes[2]<-NA  
 df.fish$leftscreen\_full\_4\_minutes\_absolute\_seconds[2]<-NA  
 df.fish$rightscreen\_full\_4\_minutes\_absolute\_seconds[2]<-NA  
 df.fish$leftscreen\_T30\_to\_T50[2]<-NA  
 df.fish$rightscreen\_T30\_to\_T50[2]<-NA  
 df.fish$leftscreen\_T30\_to\_T50\_absolute\_seconds[2]<-NA  
 df.fish$rightscreen\_T30\_to\_T50\_absolute\_seconds[2]<-NA  
 df.fish$correctscreen\_full\_4\_minutes[2]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes[2]<-NA  
 df.fish$correctscreen\_T30\_to\_T50[2]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50[2]<-NA  
 df.fish$correctscreen\_full\_4\_minutes\_absolute\_seconds[2]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes\_absolute\_seconds[2]<-NA  
 df.fish$correctscreen\_T30\_to\_T50\_absolute\_seconds[2]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50\_absolute\_seconds[2]<-NA  
 df.fish$performancescreen\_full\_4\_minutes[2]<-NA  
 df.fish$performancescreen\_T30\_to\_T50[2]<-NA  
 df.fish$perf\_greater\_than\_60\_full\_4\_minutes[2]<-NA  
 df.fish$perf\_greater\_than\_60\_T30\_to\_T50[2]<-NA  
 df.fish$latency\_enter\_corr[2]<-NA  
 df.fish$latency\_enter\_incorr[2]<-NA  
 df.fish$screen\_entered\_first[2]<-NA  
 df.fish$latency\_enter\_corr\_filtered\_just\_correct\_choice[2]<-NA  
}  
  
if (df.fish$fishname[1] == 'wildflower'){  
 df.fish$leftscreen\_full\_4\_minutes[3]<-NA  
 df.fish$rightscreen\_full\_4\_minutes[3]<-NA  
 df.fish$leftscreen\_full\_4\_minutes\_absolute\_seconds[3]<-NA  
 df.fish$rightscreen\_full\_4\_minutes\_absolute\_seconds[3]<-NA  
 df.fish$leftscreen\_T30\_to\_T50[3]<-NA  
 df.fish$rightscreen\_T30\_to\_T50[3]<-NA  
 df.fish$leftscreen\_T30\_to\_T50\_absolute\_seconds[3]<-NA  
 df.fish$rightscreen\_T30\_to\_T50\_absolute\_seconds[3]<-NA  
 df.fish$correctscreen\_full\_4\_minutes[3]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes[3]<-NA  
 df.fish$correctscreen\_T30\_to\_T50[3]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50[3]<-NA  
 df.fish$correctscreen\_full\_4\_minutes\_absolute\_seconds[3]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes\_absolute\_seconds[3]<-NA  
 df.fish$correctscreen\_T30\_to\_T50\_absolute\_seconds[3]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50\_absolute\_seconds[3]<-NA  
 df.fish$performancescreen\_full\_4\_minutes[3]<-NA  
 df.fish$performancescreen\_T30\_to\_T50[3]<-NA  
 df.fish$perf\_greater\_than\_60\_full\_4\_minutes[3]<-NA  
 df.fish$perf\_greater\_than\_60\_T30\_to\_T50[3]<-NA  
 df.fish$latency\_enter\_corr[3]<-NA  
 df.fish$latency\_enter\_incorr[3]<-NA  
 df.fish$screen\_entered\_first[3]<-NA  
 df.fish$latency\_enter\_corr\_filtered\_just\_correct\_choice[3]<-NA  
}  
  
if (df.fish$fishname[1] == 'willis'){  
 df.fish$leftscreen\_full\_4\_minutes[6]<-NA  
 df.fish$rightscreen\_full\_4\_minutes[6]<-NA  
 df.fish$leftscreen\_full\_4\_minutes\_absolute\_seconds[6]<-NA  
 df.fish$rightscreen\_full\_4\_minutes\_absolute\_seconds[6]<-NA  
 df.fish$leftscreen\_T30\_to\_T50[6]<-NA  
 df.fish$rightscreen\_T30\_to\_T50[6]<-NA  
 df.fish$leftscreen\_T30\_to\_T50\_absolute\_seconds[6]<-NA  
 df.fish$rightscreen\_T30\_to\_T50\_absolute\_seconds[6]<-NA  
 df.fish$correctscreen\_full\_4\_minutes[6]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes[6]<-NA  
 df.fish$correctscreen\_T30\_to\_T50[6]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50[6]<-NA  
 df.fish$correctscreen\_full\_4\_minutes\_absolute\_seconds[6]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes\_absolute\_seconds[6]<-NA  
 df.fish$correctscreen\_T30\_to\_T50\_absolute\_seconds[6]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50\_absolute\_seconds[6]<-NA  
 df.fish$performancescreen\_full\_4\_minutes[6]<-NA  
 df.fish$performancescreen\_T30\_to\_T50[6]<-NA  
 df.fish$perf\_greater\_than\_60\_full\_4\_minutes[6]<-NA  
 df.fish$perf\_greater\_than\_60\_T30\_to\_T50[6]<-NA  
 df.fish$latency\_enter\_corr[6]<-NA  
 df.fish$latency\_enter\_incorr[6]<-NA  
 df.fish$screen\_entered\_first[6]<-NA  
 df.fish$latency\_enter\_corr\_filtered\_just\_correct\_choice[6]<-NA  
}  
   
 if(is.na(df.sum$shapiro\_wilk\_test\_p\_value\_using\_full\_4\_minutes\_data[i]) == TRUE){  
 df.sum$was\_average\_performance\_significantly\_different\_from\_0.5\_full\_4\_minutes\_p\_value\_of\_either\_t\_test\_or\_wilcox[i]<-NA}  
   
 else if(df.sum$shapiro\_wilk\_test\_p\_value\_using\_full\_4\_minutes\_data[i] >0.05){  
 t.test.results.full.4 <-t.test(df.fish$performancescreen\_full\_4\_minutes, mu=0.5)  
 df.sum$was\_average\_performance\_significantly\_different\_from\_0.5\_full\_4\_minutes\_p\_value\_of\_either\_t\_test\_or\_wilcox[i]<-t.test.results.full.4$p.value}  
   
 else{  
 wilcox.results.full.4 <-wilcox.test(df.fish$performancescreen\_full\_4\_minutes, mu=0.5)  
 df.sum$was\_average\_performance\_significantly\_different\_from\_0.5\_full\_4\_minutes\_p\_value\_of\_either\_t\_test\_or\_wilcox[i]<-wilcox.results.full.4$p.value}  
}

## Warning in wilcox.test.default(df.fish$performancescreen\_full\_4\_minutes, :  
## cannot compute exact p-value with ties  
  
## Warning in wilcox.test.default(df.fish$performancescreen\_full\_4\_minutes, :  
## cannot compute exact p-value with ties  
  
## Warning in wilcox.test.default(df.fish$performancescreen\_full\_4\_minutes, :  
## cannot compute exact p-value with ties  
  
## Warning in wilcox.test.default(df.fish$performancescreen\_full\_4\_minutes, :  
## cannot compute exact p-value with ties  
  
## Warning in wilcox.test.default(df.fish$performancescreen\_full\_4\_minutes, :  
## cannot compute exact p-value with ties  
  
## Warning in wilcox.test.default(df.fish$performancescreen\_full\_4\_minutes, :  
## cannot compute exact p-value with ties  
  
## Warning in wilcox.test.default(df.fish$performancescreen\_full\_4\_minutes, :  
## cannot compute exact p-value with ties

for(i in 1:length(fish\_list)){  
 df.fish<- filter(df, fishname == fish\_list[i])  
if(nrow(df.fish) - sum(is.na(df.fish$performancescreen\_T30\_to\_T50)) >2){  
 shapiro.results.full.4<- shapiro.test(df.fish$performancescreen\_T30\_to\_T50)  
 df.sum$shapiro\_wilk\_test\_p\_value\_using\_T30\_to\_T50\_data[i]<- shapiro.results.full.4$p.value}  
   
else{  
 df.sum$shapiro\_wilk\_test\_p\_value\_using\_T30\_to\_T50\_data[i]<-NA}  
}  
  
for(i in 1:length(fish\_list)){  
 df.fish<- filter(df, fishname == fish\_list[i])  
 if(is.na(df.sum$shapiro\_wilk\_test\_p\_value\_using\_T30\_to\_T50\_data[i]) == TRUE){  
 df.sum$was\_average\_performance\_significantly\_different\_from\_0.5\_T30\_to\_T50\_p\_value\_of\_either\_t\_test\_or\_wilcox[i]<-NA}  
   
 else if(df.sum$shapiro\_wilk\_test\_p\_value\_using\_T30\_to\_T50\_data[i] >0.05){  
 t.test.results.full.4 <-t.test(df.fish$performancescreen\_T30\_to\_T50, mu=0.5)  
 df.sum$was\_average\_performance\_significantly\_different\_from\_0.5\_T30\_to\_T50\_p\_value\_of\_either\_t\_test\_or\_wilcox[i]<-t.test.results.full.4$p.value}  
   
 else{  
 wilcox.results.full.4 <-wilcox.test(df.fish$performancescreen\_T30\_to\_T50, mu=0.5)  
 df.sum$was\_average\_performance\_significantly\_different\_from\_0.5\_T30\_to\_T50\_p\_value\_of\_either\_t\_test\_or\_wilcox[i]<-wilcox.results.full.4$p.value}  
}

## Warning in wilcox.test.default(df.fish$performancescreen\_T30\_to\_T50, mu =  
## 0.5): cannot compute exact p-value with ties

## Warning in wilcox.test.default(df.fish$performancescreen\_T30\_to\_T50, mu =  
## 0.5): cannot compute exact p-value with ties  
  
## Warning in wilcox.test.default(df.fish$performancescreen\_T30\_to\_T50, mu =  
## 0.5): cannot compute exact p-value with ties  
  
## Warning in wilcox.test.default(df.fish$performancescreen\_T30\_to\_T50, mu =  
## 0.5): cannot compute exact p-value with ties  
  
## Warning in wilcox.test.default(df.fish$performancescreen\_T30\_to\_T50, mu =  
## 0.5): cannot compute exact p-value with ties  
  
## Warning in wilcox.test.default(df.fish$performancescreen\_T30\_to\_T50, mu =  
## 0.5): cannot compute exact p-value with ties  
  
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## 0.5): cannot compute exact p-value with ties  
  
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## Warning in wilcox.test.default(df.fish$performancescreen\_T30\_to\_T50, mu =  
## 0.5): cannot compute exact p-value with ties  
  
## Warning in wilcox.test.default(df.fish$performancescreen\_T30\_to\_T50, mu =  
## 0.5): cannot compute exact p-value with ties  
  
## Warning in wilcox.test.default(df.fish$performancescreen\_T30\_to\_T50, mu =  
## 0.5): cannot compute exact p-value with ties

#take the "number of medians above 60%" and the t test/wilcox test results and determine etheredege et al learning category (high, low, or non)  
  
for(i in 1:length(fish\_list)){  
   
 if(is.na(df.sum$number\_of\_medians\_above\_60\_using\_T30\_to\_T50\_data[i]) == TRUE){  
 df.sum$learning\_category\_according\_to\_etheredge\_T30\_to\_T50[i] <- NA}  
 else if(df.sum$number\_of\_medians\_above\_60\_using\_T30\_to\_T50\_data[i] <1){  
 df.sum$learning\_category\_according\_to\_etheredge\_T30\_to\_T50[i] <- "non"}   
 else if(df.sum$number\_of\_medians\_above\_60\_using\_T30\_to\_T50\_data[i] >0){  
 if(is.na(df.sum$was\_average\_performance\_significantly\_different\_from\_0.5\_T30\_to\_T50\_p\_value\_of\_either\_t\_test\_or\_wilcox[i]) == TRUE){  
 df.sum$learning\_category\_according\_to\_etheredge\_T30\_to\_T50[i] <- NA}  
 else if(df.sum$was\_average\_performance\_significantly\_different\_from\_0.5\_T30\_to\_T50\_p\_value\_of\_either\_t\_test\_or\_wilcox[i] <0.05){  
 df.sum$learning\_category\_according\_to\_etheredge\_T30\_to\_T50[i] <- "high"}  
 else{  
 df.sum$learning\_category\_according\_to\_etheredge\_T30\_to\_T50[i] <- "low"}  
 }  
}  
  
for(i in 1:length(fish\_list)){  
   
 if(is.na(df.sum$number\_of\_medians\_above\_60\_using\_full\_4\_minutes\_data[i]) == TRUE){  
 df.sum$learning\_category\_according\_to\_etheredge\_full\_4\_minutes[i] <- NA}  
 else if(df.sum$number\_of\_medians\_above\_60\_using\_full\_4\_minutes\_data[i] <1){  
 df.sum$learning\_category\_according\_to\_etheredge\_full\_4\_minutes[i] <- "non"}   
 else if(df.sum$number\_of\_medians\_above\_60\_using\_full\_4\_minutes\_data[i] >0){  
 if(is.na(df.sum$was\_average\_performance\_significantly\_different\_from\_0.5\_full\_4\_minutes\_p\_value\_of\_either\_t\_test\_or\_wilcox[i]) == TRUE){  
 df.sum$learning\_category\_according\_to\_etheredge\_full\_4\_minutes[i] <- NA}  
 else if(df.sum$was\_average\_performance\_significantly\_different\_from\_0.5\_full\_4\_minutes\_p\_value\_of\_either\_t\_test\_or\_wilcox[i] <0.05){  
 df.sum$learning\_category\_according\_to\_etheredge\_full\_4\_minutes[i] <- "high"}  
 else{  
 df.sum$learning\_category\_according\_to\_etheredge\_full\_4\_minutes[i] <- "low"}  
 }  
}

#did fish have a median above 60?  
for(i in 1:length(fish\_list)){  
 if(df.sum$number\_of\_medians\_above\_60\_using\_full\_4\_minutes\_data[i] > 0){  
 df.sum$did\_fish\_have\_a\_median\_above\_60[i] <- 1}  
 else if(df.sum$number\_of\_medians\_above\_60\_using\_full\_4\_minutes\_data[i] == 0){  
 df.sum$did\_fish\_have\_a\_median\_above\_60[i] <- 0}   
}

#did fish have two medians above 60?  
for(i in 1:length(fish\_list)){  
 if(df.sum$number\_of\_medians\_above\_60\_using\_full\_4\_minutes\_data[i] > 1){  
 df.sum$did\_fish\_have\_at\_least\_two\_medians\_above\_60[i] <- 1}  
 else if(df.sum$number\_of\_medians\_above\_60\_using\_full\_4\_minutes\_data[i] <= 1){  
 df.sum$did\_fish\_have\_at\_least\_two\_medians\_above\_60[i] <- 0}   
}

#average latency to enter the correct and incorrectside  
  
for(i in 1:length(fish\_list)){  
   
df.fish<- filter(df, fishname == fish\_list[i])  
  
if (df.fish$fishname[1] == 'gideon'){  
 df.fish$leftscreen\_full\_4\_minutes[2]<-NA  
 df.fish$rightscreen\_full\_4\_minutes[2]<-NA  
 df.fish$leftscreen\_full\_4\_minutes\_absolute\_seconds[2]<-NA  
 df.fish$rightscreen\_full\_4\_minutes\_absolute\_seconds[2]<-NA  
 df.fish$leftscreen\_T30\_to\_T50[2]<-NA  
 df.fish$rightscreen\_T30\_to\_T50[2]<-NA  
 df.fish$leftscreen\_T30\_to\_T50\_absolute\_seconds[2]<-NA  
 df.fish$rightscreen\_T30\_to\_T50\_absolute\_seconds[2]<-NA  
 df.fish$correctscreen\_full\_4\_minutes[2]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes[2]<-NA  
 df.fish$correctscreen\_T30\_to\_T50[2]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50[2]<-NA  
 df.fish$correctscreen\_full\_4\_minutes\_absolute\_seconds[2]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes\_absolute\_seconds[2]<-NA  
 df.fish$correctscreen\_T30\_to\_T50\_absolute\_seconds[2]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50\_absolute\_seconds[2]<-NA  
 df.fish$performancescreen\_full\_4\_minutes[2]<-NA  
 df.fish$performancescreen\_T30\_to\_T50[2]<-NA  
 df.fish$perf\_greater\_than\_60\_full\_4\_minutes[2]<-NA  
 df.fish$perf\_greater\_than\_60\_T30\_to\_T50[2]<-NA  
 df.fish$latency\_enter\_corr[2]<-NA  
 df.fish$latency\_enter\_incorr[2]<-NA  
 df.fish$screen\_entered\_first[2]<-NA  
 df.fish$latency\_enter\_corr\_filtered\_just\_correct\_choice[2]<-NA  
}  
  
if (df.fish$fishname[1] == 'wildflower'){  
 df.fish$leftscreen\_full\_4\_minutes[3]<-NA  
 df.fish$rightscreen\_full\_4\_minutes[3]<-NA  
 df.fish$leftscreen\_full\_4\_minutes\_absolute\_seconds[3]<-NA  
 df.fish$rightscreen\_full\_4\_minutes\_absolute\_seconds[3]<-NA  
 df.fish$leftscreen\_T30\_to\_T50[3]<-NA  
 df.fish$rightscreen\_T30\_to\_T50[3]<-NA  
 df.fish$leftscreen\_T30\_to\_T50\_absolute\_seconds[3]<-NA  
 df.fish$rightscreen\_T30\_to\_T50\_absolute\_seconds[3]<-NA  
 df.fish$correctscreen\_full\_4\_minutes[3]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes[3]<-NA  
 df.fish$correctscreen\_T30\_to\_T50[3]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50[3]<-NA  
 df.fish$correctscreen\_full\_4\_minutes\_absolute\_seconds[3]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes\_absolute\_seconds[3]<-NA  
 df.fish$correctscreen\_T30\_to\_T50\_absolute\_seconds[3]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50\_absolute\_seconds[3]<-NA  
 df.fish$performancescreen\_full\_4\_minutes[3]<-NA  
 df.fish$performancescreen\_T30\_to\_T50[3]<-NA  
 df.fish$perf\_greater\_than\_60\_full\_4\_minutes[3]<-NA  
 df.fish$perf\_greater\_than\_60\_T30\_to\_T50[3]<-NA  
 df.fish$latency\_enter\_corr[3]<-NA  
 df.fish$latency\_enter\_incorr[3]<-NA  
 df.fish$screen\_entered\_first[3]<-NA  
 df.fish$latency\_enter\_corr\_filtered\_just\_correct\_choice[3]<-NA  
}  
  
if (df.fish$fishname[1] == 'willis'){  
 df.fish$leftscreen\_full\_4\_minutes[6]<-NA  
 df.fish$rightscreen\_full\_4\_minutes[6]<-NA  
 df.fish$leftscreen\_full\_4\_minutes\_absolute\_seconds[6]<-NA  
 df.fish$rightscreen\_full\_4\_minutes\_absolute\_seconds[6]<-NA  
 df.fish$leftscreen\_T30\_to\_T50[6]<-NA  
 df.fish$rightscreen\_T30\_to\_T50[6]<-NA  
 df.fish$leftscreen\_T30\_to\_T50\_absolute\_seconds[6]<-NA  
 df.fish$rightscreen\_T30\_to\_T50\_absolute\_seconds[6]<-NA  
 df.fish$correctscreen\_full\_4\_minutes[6]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes[6]<-NA  
 df.fish$correctscreen\_T30\_to\_T50[6]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50[6]<-NA  
 df.fish$correctscreen\_full\_4\_minutes\_absolute\_seconds[6]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes\_absolute\_seconds[6]<-NA  
 df.fish$correctscreen\_T30\_to\_T50\_absolute\_seconds[6]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50\_absolute\_seconds[6]<-NA  
 df.fish$performancescreen\_full\_4\_minutes[6]<-NA  
 df.fish$performancescreen\_T30\_to\_T50[6]<-NA  
 df.fish$perf\_greater\_than\_60\_full\_4\_minutes[6]<-NA  
 df.fish$perf\_greater\_than\_60\_T30\_to\_T50[6]<-NA  
 df.fish$latency\_enter\_corr[6]<-NA  
 df.fish$latency\_enter\_incorr[6]<-NA  
 df.fish$screen\_entered\_first[6]<-NA  
 df.fish$latency\_enter\_corr\_filtered\_just\_correct\_choice[6]<-NA  
}  
  
df.sum$average\_latency\_to\_enter\_correct\_side[i]<- mean(df.fish$latency\_enter\_corr, na.rm =TRUE)  
df.sum$average\_latency\_to\_enter\_incorrect\_side[i]<- mean(df.fish$latency\_enter\_incorr, na.rm =TRUE)  
df.sum$average\_latency\_to\_enter\_correct\_side\_filtered\_just\_correct\_choice[i]<- mean(df.fish$latency\_enter\_corr\_filtered\_just\_correct\_choice, na.rm =TRUE)  
}

#proportion of trials where the correct side was chosen first (excludes trials where NA)  
  
for(i in 1:length(fish\_list)){  
df.fish<- filter(df, fishname == fish\_list[i])  
  
if (df.fish$fishname[1] == 'gideon'){  
 df.fish$leftscreen\_full\_4\_minutes[2]<-NA  
 df.fish$rightscreen\_full\_4\_minutes[2]<-NA  
 df.fish$leftscreen\_full\_4\_minutes\_absolute\_seconds[2]<-NA  
 df.fish$rightscreen\_full\_4\_minutes\_absolute\_seconds[2]<-NA  
 df.fish$leftscreen\_T30\_to\_T50[2]<-NA  
 df.fish$rightscreen\_T30\_to\_T50[2]<-NA  
 df.fish$leftscreen\_T30\_to\_T50\_absolute\_seconds[2]<-NA  
 df.fish$rightscreen\_T30\_to\_T50\_absolute\_seconds[2]<-NA  
 df.fish$correctscreen\_full\_4\_minutes[2]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes[2]<-NA  
 df.fish$correctscreen\_T30\_to\_T50[2]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50[2]<-NA  
 df.fish$correctscreen\_full\_4\_minutes\_absolute\_seconds[2]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes\_absolute\_seconds[2]<-NA  
 df.fish$correctscreen\_T30\_to\_T50\_absolute\_seconds[2]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50\_absolute\_seconds[2]<-NA  
 df.fish$performancescreen\_full\_4\_minutes[2]<-NA  
 df.fish$performancescreen\_T30\_to\_T50[2]<-NA  
 df.fish$perf\_greater\_than\_60\_full\_4\_minutes[2]<-NA  
 df.fish$perf\_greater\_than\_60\_T30\_to\_T50[2]<-NA  
 df.fish$latency\_enter\_corr[2]<-NA  
 df.fish$latency\_enter\_incorr[2]<-NA  
 df.fish$screen\_entered\_first[2]<-NA  
 df.fish$latency\_enter\_corr\_filtered\_just\_correct\_choice[2]<-NA  
}  
  
if (df.fish$fishname[1] == 'wildflower'){  
 df.fish$leftscreen\_full\_4\_minutes[3]<-NA  
 df.fish$rightscreen\_full\_4\_minutes[3]<-NA  
 df.fish$leftscreen\_full\_4\_minutes\_absolute\_seconds[3]<-NA  
 df.fish$rightscreen\_full\_4\_minutes\_absolute\_seconds[3]<-NA  
 df.fish$leftscreen\_T30\_to\_T50[3]<-NA  
 df.fish$rightscreen\_T30\_to\_T50[3]<-NA  
 df.fish$leftscreen\_T30\_to\_T50\_absolute\_seconds[3]<-NA  
 df.fish$rightscreen\_T30\_to\_T50\_absolute\_seconds[3]<-NA  
 df.fish$correctscreen\_full\_4\_minutes[3]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes[3]<-NA  
 df.fish$correctscreen\_T30\_to\_T50[3]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50[3]<-NA  
 df.fish$correctscreen\_full\_4\_minutes\_absolute\_seconds[3]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes\_absolute\_seconds[3]<-NA  
 df.fish$correctscreen\_T30\_to\_T50\_absolute\_seconds[3]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50\_absolute\_seconds[3]<-NA  
 df.fish$performancescreen\_full\_4\_minutes[3]<-NA  
 df.fish$performancescreen\_T30\_to\_T50[3]<-NA  
 df.fish$perf\_greater\_than\_60\_full\_4\_minutes[3]<-NA  
 df.fish$perf\_greater\_than\_60\_T30\_to\_T50[3]<-NA  
 df.fish$latency\_enter\_corr[3]<-NA  
 df.fish$latency\_enter\_incorr[3]<-NA  
 df.fish$screen\_entered\_first[3]<-NA  
 df.fish$latency\_enter\_corr\_filtered\_just\_correct\_choice[3]<-NA  
}  
  
if (df.fish$fishname[1] == 'willis'){  
 df.fish$leftscreen\_full\_4\_minutes[6]<-NA  
 df.fish$rightscreen\_full\_4\_minutes[6]<-NA  
 df.fish$leftscreen\_full\_4\_minutes\_absolute\_seconds[6]<-NA  
 df.fish$rightscreen\_full\_4\_minutes\_absolute\_seconds[6]<-NA  
 df.fish$leftscreen\_T30\_to\_T50[6]<-NA  
 df.fish$rightscreen\_T30\_to\_T50[6]<-NA  
 df.fish$leftscreen\_T30\_to\_T50\_absolute\_seconds[6]<-NA  
 df.fish$rightscreen\_T30\_to\_T50\_absolute\_seconds[6]<-NA  
 df.fish$correctscreen\_full\_4\_minutes[6]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes[6]<-NA  
 df.fish$correctscreen\_T30\_to\_T50[6]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50[6]<-NA  
 df.fish$correctscreen\_full\_4\_minutes\_absolute\_seconds[6]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes\_absolute\_seconds[6]<-NA  
 df.fish$correctscreen\_T30\_to\_T50\_absolute\_seconds[6]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50\_absolute\_seconds[6]<-NA  
 df.fish$performancescreen\_full\_4\_minutes[6]<-NA  
 df.fish$performancescreen\_T30\_to\_T50[6]<-NA  
 df.fish$perf\_greater\_than\_60\_full\_4\_minutes[6]<-NA  
 df.fish$perf\_greater\_than\_60\_T30\_to\_T50[6]<-NA  
 df.fish$latency\_enter\_corr[6]<-NA  
 df.fish$latency\_enter\_incorr[6]<-NA  
 df.fish$screen\_entered\_first[6]<-NA  
 df.fish$latency\_enter\_corr\_filtered\_just\_correct\_choice[6]<-NA  
}  
  
df.fish.correct<-filter(df.fish, df.fish$screen\_entered\_first == "correct")  
number\_correct<-nrow(df.fish.correct)  
df.fish.incorrect<-filter(df.fish, df.fish$screen\_entered\_first == "incorrect")  
number\_incorrect<-nrow(df.fish.incorrect)  
  
df.sum$proportion\_of\_correct\_first\_choices[i]<- number\_correct/(number\_incorrect+ number\_correct)  
}

#Get the number of testing trials in a row where a) performance was above 60% useing the full four minutes data, b) performance was above 60% using the T30 to T50 data, or c) if correct or was picked first  
  
for(j in 1:nrow(df.sum)){  
 #print(j)  
df.fish<- filter(df, fishname == fish\_list[j])  
df.fish[, c(12, 13)] <- sapply(df.fish[, c(12,13)], as.numeric)  
  
if (df.fish$fishname[1] == 'gideon'){  
 df.fish$leftscreen\_full\_4\_minutes[2]<-NA  
 df.fish$rightscreen\_full\_4\_minutes[2]<-NA  
 df.fish$leftscreen\_full\_4\_minutes\_absolute\_seconds[2]<-NA  
 df.fish$rightscreen\_full\_4\_minutes\_absolute\_seconds[2]<-NA  
 df.fish$leftscreen\_T30\_to\_T50[2]<-NA  
 df.fish$rightscreen\_T30\_to\_T50[2]<-NA  
 df.fish$leftscreen\_T30\_to\_T50\_absolute\_seconds[2]<-NA  
 df.fish$rightscreen\_T30\_to\_T50\_absolute\_seconds[2]<-NA  
 df.fish$correctscreen\_full\_4\_minutes[2]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes[2]<-NA  
 df.fish$correctscreen\_T30\_to\_T50[2]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50[2]<-NA  
 df.fish$correctscreen\_full\_4\_minutes\_absolute\_seconds[2]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes\_absolute\_seconds[2]<-NA  
 df.fish$correctscreen\_T30\_to\_T50\_absolute\_seconds[2]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50\_absolute\_seconds[2]<-NA  
 df.fish$performancescreen\_full\_4\_minutes[2]<-NA  
 df.fish$performancescreen\_T30\_to\_T50[2]<-NA  
 df.fish$perf\_greater\_than\_60\_full\_4\_minutes[2]<-NA  
 df.fish$perf\_greater\_than\_60\_T30\_to\_T50[2]<-NA  
 df.fish$latency\_enter\_corr[2]<-NA  
 df.fish$latency\_enter\_incorr[2]<-NA  
 df.fish$screen\_entered\_first[2]<-NA  
 df.fish$latency\_enter\_corr\_filtered\_just\_correct\_choice[2]<-NA  
}  
  
if (df.fish$fishname[1] == 'wildflower'){  
 df.fish$leftscreen\_full\_4\_minutes[3]<-NA  
 df.fish$rightscreen\_full\_4\_minutes[3]<-NA  
 df.fish$leftscreen\_full\_4\_minutes\_absolute\_seconds[3]<-NA  
 df.fish$rightscreen\_full\_4\_minutes\_absolute\_seconds[3]<-NA  
 df.fish$leftscreen\_T30\_to\_T50[3]<-NA  
 df.fish$rightscreen\_T30\_to\_T50[3]<-NA  
 df.fish$leftscreen\_T30\_to\_T50\_absolute\_seconds[3]<-NA  
 df.fish$rightscreen\_T30\_to\_T50\_absolute\_seconds[3]<-NA  
 df.fish$correctscreen\_full\_4\_minutes[3]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes[3]<-NA  
 df.fish$correctscreen\_T30\_to\_T50[3]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50[3]<-NA  
 df.fish$correctscreen\_full\_4\_minutes\_absolute\_seconds[3]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes\_absolute\_seconds[3]<-NA  
 df.fish$correctscreen\_T30\_to\_T50\_absolute\_seconds[3]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50\_absolute\_seconds[3]<-NA  
 df.fish$performancescreen\_full\_4\_minutes[3]<-NA  
 df.fish$performancescreen\_T30\_to\_T50[3]<-NA  
 df.fish$perf\_greater\_than\_60\_full\_4\_minutes[3]<-NA  
 df.fish$perf\_greater\_than\_60\_T30\_to\_T50[3]<-NA  
 df.fish$latency\_enter\_corr[3]<-NA  
 df.fish$latency\_enter\_incorr[3]<-NA  
 df.fish$screen\_entered\_first[3]<-NA  
 df.fish$latency\_enter\_corr\_filtered\_just\_correct\_choice[3]<-NA  
}  
  
if (df.fish$fishname[1] == 'willis'){  
 df.fish$leftscreen\_full\_4\_minutes[6]<-NA  
 df.fish$rightscreen\_full\_4\_minutes[6]<-NA  
 df.fish$leftscreen\_full\_4\_minutes\_absolute\_seconds[6]<-NA  
 df.fish$rightscreen\_full\_4\_minutes\_absolute\_seconds[6]<-NA  
 df.fish$leftscreen\_T30\_to\_T50[6]<-NA  
 df.fish$rightscreen\_T30\_to\_T50[6]<-NA  
 df.fish$leftscreen\_T30\_to\_T50\_absolute\_seconds[6]<-NA  
 df.fish$rightscreen\_T30\_to\_T50\_absolute\_seconds[6]<-NA  
 df.fish$correctscreen\_full\_4\_minutes[6]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes[6]<-NA  
 df.fish$correctscreen\_T30\_to\_T50[6]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50[6]<-NA  
 df.fish$correctscreen\_full\_4\_minutes\_absolute\_seconds[6]<-NA  
 df.fish$incorrectscreen\_full\_4\_minutes\_absolute\_seconds[6]<-NA  
 df.fish$correctscreen\_T30\_to\_T50\_absolute\_seconds[6]<-NA  
 df.fish$incorrectscreen\_T30\_to\_T50\_absolute\_seconds[6]<-NA  
 df.fish$performancescreen\_full\_4\_minutes[6]<-NA  
 df.fish$performancescreen\_T30\_to\_T50[6]<-NA  
 df.fish$perf\_greater\_than\_60\_full\_4\_minutes[6]<-NA  
 df.fish$perf\_greater\_than\_60\_T30\_to\_T50[6]<-NA  
 df.fish$latency\_enter\_corr[6]<-NA  
 df.fish$latency\_enter\_incorr[6]<-NA  
 df.fish$screen\_entered\_first[6]<-NA  
 df.fish$latency\_enter\_corr\_filtered\_just\_correct\_choice[6]<-NA  
}  
  
df.fish<- df.fish[order(df.fish$day, df.fish$trial),]  
  
  
countlist\_full\_4\_minutes <- vector(length=9)  
countlist\_T30\_to\_T50 <- vector(length=9)  
countlist\_correct\_choice\_first <- vector(length=9)  
  
countlist\_full\_4\_minutes[1] <- 0  
countlist\_T30\_to\_T50[1] <- 0  
countlist\_correct\_choice\_first[1] <- 0  
  
 for(i in 1:nrow(df.fish)){  
 if (is.na(df.fish$perf\_greater\_than\_60\_full\_4\_minutes[i]) == TRUE){  
 if(i == 1){  
 countlist\_full\_4\_minutes[i]<- 0}  
 else{  
 countlist\_full\_4\_minutes[i]<- countlist\_full\_4\_minutes[i-1]}}  
 else if (df.fish$perf\_greater\_than\_60\_full\_4\_minutes[i] == 1){  
 if(i == 1){  
 countlist\_full\_4\_minutes[i]<- 1}  
 else{  
 countlist\_full\_4\_minutes[i]<- countlist\_full\_4\_minutes[i-1] + 1}}   
 else if (df.fish$perf\_greater\_than\_60\_full\_4\_minutes[i] == 0){  
 countlist\_full\_4\_minutes[i]<- 0}  
 }  
  
 for(i in 1:nrow(df.fish)){  
 if (is.na(df.fish$perf\_greater\_than\_60\_T30\_to\_T50[i]) == TRUE){  
 if(i == 1){  
 countlist\_T30\_to\_T50[i]<- 0}  
 else{  
 countlist\_T30\_to\_T50[i]<- countlist\_T30\_to\_T50[i-1]}}  
 else if (df.fish$perf\_greater\_than\_60\_T30\_to\_T50[i] == 1){  
 if(i == 1){  
 countlist\_T30\_to\_T50[i]<- 1}  
 else{  
 countlist\_T30\_to\_T50[i]<- countlist\_T30\_to\_T50[i-1] + 1}}   
 else if (df.fish$perf\_greater\_than\_60\_T30\_to\_T50[i] == 0){  
 countlist\_T30\_to\_T50[i]<- 0}  
 }  
  
 for(i in 1:nrow(df.fish)){  
 if (is.na(df.fish$screen\_entered\_first[i]) == TRUE){  
 if(i == 1){  
 countlist\_correct\_choice\_first[i]<- 0}  
 else{  
 countlist\_correct\_choice\_first[i]<- countlist\_correct\_choice\_first[i-1]}}  
 else if (df.fish$screen\_entered\_first[i] == 'incorrect'){  
 countlist\_correct\_choice\_first[i]<- 0}  
 else if (df.fish$screen\_entered\_first[i] == 'correct'){  
 if(i == 1){  
 countlist\_correct\_choice\_first[i]<- 1}  
 else{  
 countlist\_correct\_choice\_first[i]<- countlist\_correct\_choice\_first[i-1] + 1}}   
 }  
  
streak.full\_4\_minutes<-max(countlist\_full\_4\_minutes)  
streak.T30\_to\_T50<-max(countlist\_T30\_to\_T50)  
streak.correct\_choice\_first<- max(countlist\_correct\_choice\_first)  
  
df.sum$number\_of\_trials\_in\_a\_row\_greater\_than\_60\_percent\_full\_4\_minutes[j] <- streak.full\_4\_minutes  
df.sum$number\_of\_trials\_in\_a\_row\_greater\_than\_60\_percent\_T30\_to\_T50[j] <- streak.T30\_to\_T50  
df.sum$number\_of\_trials\_in\_a\_row\_correct\_choice\_first[j] <- streak.correct\_choice\_first  
  
  
}

#This is to check for any score sheets where the entries are doubled, don't actually need to rerun this part  
  
for(i in 1:length(file\_list)){  
 setwd("C:/Users/Kelly/Desktop/Grad School/Cummings Lab/Comparative Cognition/numerosity cc score sheets")  
   
 fil <- read\_csv(file\_list[i], col\_names = TRUE, col\_types = NULL)  
 filename <- file\_list[i]  
 if (fil$code[1] == fil$code[2]){  
 print (filename)  
 }  
}

## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
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## code = col\_character(),  
## class = col\_integer()  
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## code = col\_character(),  
## class = col\_integer()  
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## class = col\_integer()  
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## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
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## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )

## [1] "compcog\_num\_AK\_wheatley\_9\_3\_12\_8\_L\_67\_M\_2380\_1\_L1\_NSD\_2017-11-17T213734\_012.csv"

## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )

## [1] "compcog\_num\_AK\_wheatley\_9\_5\_7\_14\_R\_50\_M\_2380\_1\_L1\_NSD\_2017-11-17T214451\_365.csv"

## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
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## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
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## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
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## code = col\_character(),  
## class = col\_integer()  
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## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
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## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
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## code = col\_character(),  
## class = col\_integer()  
## )  
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## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )

## [1] "compcog\_num\_AR\_Wayne\_9\_3\_12\_8\_L\_67\_M\_2115\_4\_L1\_DNS\_2017-11-20T224829\_139.csv"

## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
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## code = col\_character(),  
## class = col\_integer()  
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## code = col\_character(),  
## class = col\_integer()  
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## code = col\_character(),  
## class = col\_integer()  
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## code = col\_character(),  
## class = col\_integer()  
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## code = col\_character(),  
## class = col\_integer()  
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## code = col\_character(),  
## class = col\_integer()  
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## code = col\_character(),  
## class = col\_integer()  
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## class = col\_integer()  
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## code = col\_character(),  
## class = col\_integer()  
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## code = col\_character(),  
## class = col\_integer()  
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## code = col\_character(),  
## class = col\_integer()  
## )  
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## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
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## code = col\_character(),  
## class = col\_integer()  
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## code = col\_character(),  
## class = col\_integer()  
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## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )

## [1] "compcog\_num\_DH\_waldhurga\_9\_5\_9\_12\_R\_75\_F\_3066\_5\_L2\_SND\_2017-11-16T175249\_389.csv"

## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
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## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )

## [1] "compcog\_num\_RD\_gabriel\_10\_5\_9\_12\_L\_75\_M\_2050\_3\_H3\_DSN\_2017-11-27T193434\_020.csv"

## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )

## [1] "compcog\_num\_RD\_gabriel\_11\_3\_12\_8\_R\_67\_M\_2050\_3\_H3\_DSN\_2017-11-27T195111\_342.csv"

## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )

## [1] "compcog\_num\_RD\_gabriel\_11\_5\_7\_14\_L\_50\_M\_2050\_3\_H3\_DSN\_2017-11-27T200255\_975.csv"

## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
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## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
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## time = col\_double(),  
## code = col\_character(),  
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## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
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## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
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## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
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## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
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## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
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## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
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## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
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## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
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## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )  
## Parsed with column specification:  
## cols(  
## time = col\_double(),  
## code = col\_character(),  
## class = col\_integer()  
## )

#get mean of medians (i.e. mean of the 3 values: median performance on 50, 67, and 75)  
  
for(i in 1:nrow(df.sum)){  
 df.sum$mean\_of\_median\_performance\_on\_each\_ratio\_full\_four\_minutes\_data[i] <- mean(c(df.sum$median\_performance\_on\_0.50\_ratio\_using\_full\_4\_minutes\_data[i],df.sum$median\_performance\_on\_0.67\_ratio\_using\_full\_4\_minutes\_data[i], df.sum$median\_performance\_on\_0.75\_ratio\_using\_full\_4\_minutes\_data[i]), na.rm = TRUE)  
   
 df.sum$mean\_of\_median\_performance\_on\_each\_ratio\_T30\_to\_T50\_data[i] <- mean(c(df.sum$median\_performance\_on\_0.50\_ratio\_using\_T30\_to\_T50\_data[i],df.sum$median\_performance\_on\_0.67\_ratio\_using\_T30\_to\_T50\_data[i], df.sum$median\_performance\_on\_0.75\_ratio\_using\_T30\_to\_T50\_data[i]), na.rm = TRUE)   
}

#Export as a csv file  
  
write\_csv(df.sum, "Numerosity Comparative Cognition Full Dataset May\_7\_2018.csv")

S T O P H E R E

#This next section is if we want to write out a dataframe that has the relevant information about EACH TRIAL as a new column!  
  
  
  
for(i in 1:length(fish\_list)){  
 df.fish<- filter(df, fishname == fish\_list[i])  
 df.fish.91 <- filter(df.fish, day == '9', trial == '1')  
 df.fish.93 <- filter(df.fish, day == '9', trial == '3')  
 df.fish.95 <- filter(df.fish, day == '9', trial == '5')  
 df.fish.101 <- filter(df.fish, day == '10', trial == '1')  
 df.fish.103 <- filter(df.fish, day == '10', trial == '3')  
 df.fish.105 <- filter(df.fish, day == '10', trial == '5')  
 df.fish.111 <- filter(df.fish, day == '11', trial == '1')  
 df.fish.113 <- filter(df.fish, day == '11', trial == '3')  
 df.fish.115 <- filter(df.fish, day == '11', trial == '5')  
   
 if (nrow(df.fish.91) == 0){  
 df.sum$Trial\_9\_1\_correctside[i] <-NA  
 df.sum$Trial\_9\_1\_ratio[i] <-NA  
 df.sum$Trial\_9\_1\_performance\_over\_full\_4\_minutes\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[i]<-NA  
 df.sum$Trial\_9\_1\_performance\_over\_T30\_to\_T50\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[i]<-NA  
 df.sum$Trial\_9\_1\_was\_performance\_over\_full\_4\_minutes\_greater\_than\_60\_percent[i]<-NA  
 df.sum$Trial\_9\_1\_was\_performance\_T30\_to\_T50\_greater\_than\_60\_percent[i]<-NA   
 df.sum$Trial\_9\_1\_reaction\_time[i]<-NA  
 df.sum$Trial\_9\_1\_latency\_to\_enter\_correct\_side[i]<-NA  
 df.sum$Trial\_9\_1\_latency\_to\_enter\_correct\_side\_filtered\_just\_correct\_choice[i]<-NA  
 df.sum$Trial\_9\_1\_latency\_to\_enter\_incorrect\_side[i]<-NA  
 df.sum$Trial\_9\_1\_screen\_entered\_first[i]<-NA   
 df.sum$Trial\_9\_1\_time\_spent\_in\_correct\_screen\_full\_4\_minutes\_absolute\_seconds[i]<-NA  
 df.sum$Trial\_9\_1\_time\_spent\_in\_incorrect\_screen\_full\_4\_minutes\_absolute\_seconds[i]<-NA  
 df.sum$Trial\_9\_1\_time\_spent\_in\_correct\_screen\_T30\_to\_T50\_absolute\_seconds[i]<-NA  
 df.sum$Trial\_9\_1\_time\_spent\_in\_incorrect\_screen\_T30\_to\_T50\_absolute\_seconds[i]<-NA  
   
 }  
 else{  
 df.sum$Trial\_9\_1\_correctside[i] <- df.fish.91$correctside  
 df.sum$Trial\_9\_1\_ratio[i] <-df.fish.91$ratio  
 df.sum$Trial\_9\_1\_performance\_over\_full\_4\_minutes\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[i]<- df.fish.91$performancescreen\_full\_4\_minutes  
 df.sum$Trial\_9\_1\_performance\_over\_T30\_to\_T50\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[i]<- df.fish.91$performancescreen\_T30\_to\_T50  
 df.sum$Trial\_9\_1\_was\_performance\_over\_full\_4\_minutes\_greater\_than\_60\_percent[i]<-df.fish.91$perf\_greater\_than\_60\_full\_4\_minutes  
 df.sum$Trial\_9\_1\_was\_performance\_T30\_to\_T50\_greater\_than\_60\_percent[i]<-df.fish.91$perf\_greater\_than\_60\_T30\_to\_T50  
 df.sum$Trial\_9\_1\_reaction\_time[i]<-df.fish.91$reaction\_time  
 df.sum$Trial\_9\_1\_latency\_to\_enter\_correct\_side[i]<-df.fish.91$latency\_enter\_corr  
 df.sum$Trial\_9\_1\_latency\_to\_enter\_correct\_side\_filtered\_just\_correct\_choice[i]<-df.fish.91$latency\_enter\_corr\_filtered\_just\_correct\_choice  
 df.sum$Trial\_9\_1\_latency\_to\_enter\_incorrect\_side[i]<-df.fish.91$latency\_enter\_incorr  
 df.sum$Trial\_9\_1\_screen\_entered\_first[i]<-df.fish.91$screen\_entered\_first  
 df.sum$Trial\_9\_1\_time\_spent\_in\_correct\_screen\_full\_4\_minutes\_absolute\_seconds[i]<- df.fish.91$correctscreen\_full\_4\_minutes\_absolute\_seconds  
 df.sum$Trial\_9\_1\_time\_spent\_in\_incorrect\_screen\_full\_4\_minutes\_absolute\_seconds[i]<-df.fish.91$incorrectscreen\_full\_4\_minutes\_absolute\_seconds  
 df.sum$Trial\_9\_1\_time\_spent\_in\_correct\_screen\_T30\_to\_T50\_absolute\_seconds[i]<-df.fish.91$correctscreen\_T30\_to\_T50\_absolute\_seconds  
 df.sum$Trial\_9\_1\_time\_spent\_in\_incorrect\_screen\_T30\_to\_T50\_absolute\_seconds[i]<-df.fish.91$correctscreen\_T30\_to\_T50\_absolute\_seconds  
 }  
   
 if (nrow(df.fish.93) == 0){  
 df.sum$Trial\_9\_3\_correctside[i] <-NA  
 df.sum$Trial\_9\_3\_ratio[i] <-NA  
 df.sum$Trial\_9\_3\_performance\_over\_full\_4\_minutes\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[i]<-NA  
 df.sum$Trial\_9\_3\_performance\_over\_T30\_to\_T50\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[i]<-NA  
 df.sum$Trial\_9\_3\_was\_performance\_over\_full\_4\_minutes\_greater\_than\_60\_percent[i]<-NA  
 df.sum$Trial\_9\_3\_was\_performance\_T30\_to\_T50\_greater\_than\_60\_percent[i]<-NA   
 df.sum$Trial\_9\_3\_reaction\_time[i]<-NA  
 df.sum$Trial\_9\_3\_latency\_to\_enter\_correct\_side[i]<-NA  
 df.sum$Trial\_9\_3\_latency\_to\_enter\_correct\_side\_filtered\_just\_correct\_choice[i]<-NA  
 df.sum$Trial\_9\_3\_latency\_to\_enter\_incorrect\_side[i]<-NA  
 df.sum$Trial\_9\_3\_screen\_entered\_first[i]<-NA  
 df.sum$Trial\_9\_3\_time\_spent\_in\_correct\_screen\_full\_4\_minutes\_absolute\_seconds[i]<-NA  
 df.sum$Trial\_9\_3\_time\_spent\_in\_incorrect\_screen\_full\_4\_minutes\_absolute\_seconds[i]<-NA  
 df.sum$Trial\_9\_3\_time\_spent\_in\_correct\_screen\_T30\_to\_T50\_absolute\_seconds[i]<-NA  
 df.sum$Trial\_9\_3\_time\_spent\_in\_incorrect\_screen\_T30\_to\_T50\_absolute\_seconds[i]<-NA  
 }  
 else{  
 df.sum$Trial\_9\_3\_correctside[i] <- df.fish.93$correctside  
 df.sum$Trial\_9\_3\_ratio[i] <-df.fish.93$ratio  
 df.sum$Trial\_9\_3\_performance\_over\_full\_4\_minutes\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[i]<- df.fish.93$performancescreen\_full\_4\_minutes  
 df.sum$Trial\_9\_3\_performance\_over\_T30\_to\_T50\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[i]<- df.fish.93$performancescreen\_T30\_to\_T50  
 df.sum$Trial\_9\_3\_was\_performance\_over\_full\_4\_minutes\_greater\_than\_60\_percent[i]<-df.fish.93$perf\_greater\_than\_60\_full\_4\_minutes  
 df.sum$Trial\_9\_3\_was\_performance\_T30\_to\_T50\_greater\_than\_60\_percent[i]<-df.fish.93$perf\_greater\_than\_60\_T30\_to\_T50  
 df.sum$Trial\_9\_3\_reaction\_time[i]<-df.fish.93$reaction\_time  
 df.sum$Trial\_9\_3\_latency\_to\_enter\_correct\_side[i]<-df.fish.93$latency\_enter\_corr  
 df.sum$Trial\_9\_3\_latency\_to\_enter\_correct\_side\_filtered\_just\_correct\_choice[i]<-df.fish.93$latency\_enter\_corr\_filtered\_just\_correct\_choice  
 df.sum$Trial\_9\_3\_latency\_to\_enter\_incorrect\_side[i]<-df.fish.93$latency\_enter\_incorr  
 df.sum$Trial\_9\_3\_screen\_entered\_first[i]<-df.fish.93$screen\_entered\_first  
 df.sum$Trial\_9\_3\_time\_spent\_in\_correct\_screen\_full\_4\_minutes\_absolute\_seconds[i]<- df.fish.93$correctscreen\_full\_4\_minutes\_absolute\_seconds  
 df.sum$Trial\_9\_3\_time\_spent\_in\_incorrect\_screen\_full\_4\_minutes\_absolute\_seconds[i]<-df.fish.93$incorrectscreen\_full\_4\_minutes\_absolute\_seconds  
 df.sum$Trial\_9\_3\_time\_spent\_in\_correct\_screen\_T30\_to\_T50\_absolute\_seconds[i]<-df.fish.93$correctscreen\_T30\_to\_T50\_absolute\_seconds  
 df.sum$Trial\_9\_3\_time\_spent\_in\_incorrect\_screen\_T30\_to\_T50\_absolute\_seconds[i]<-df.fish.93$correctscreen\_T30\_to\_T50\_absolute\_seconds  
 }  
   
 if (nrow(df.fish.95) == 0){  
 df.sum$Trial\_9\_5\_correctside[i] <-NA  
 df.sum$Trial\_9\_5\_ratio[i] <-NA  
 df.sum$Trial\_9\_5\_performance\_over\_full\_4\_minutes\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[i]<-NA  
 df.sum$Trial\_9\_5\_performance\_over\_T30\_to\_T50\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[i]<-NA  
 df.sum$Trial\_9\_5\_was\_performance\_over\_full\_4\_minutes\_greater\_than\_60\_percent[i]<-NA  
 df.sum$Trial\_9\_5\_was\_performance\_T30\_to\_T50\_greater\_than\_60\_percent[i]<-NA   
 df.sum$Trial\_9\_5\_reaction\_time[i]<-NA  
 df.sum$Trial\_9\_5\_latency\_to\_enter\_correct\_side[i]<-NA  
 df.sum$Trial\_9\_5\_latency\_to\_enter\_correct\_side\_filtered\_just\_correct\_choice[i]<-NA  
 df.sum$Trial\_9\_5\_latency\_to\_enter\_incorrect\_side[i]<-NA  
 df.sum$Trial\_9\_5\_screen\_entered\_first[i]<-NA   
 df.sum$Trial\_9\_5\_time\_spent\_in\_correct\_screen\_full\_4\_minutes\_absolute\_seconds[i]<-NA  
 df.sum$Trial\_9\_5\_time\_spent\_in\_incorrect\_screen\_full\_4\_minutes\_absolute\_seconds[i]<-NA  
 df.sum$Trial\_9\_5\_time\_spent\_in\_correct\_screen\_T30\_to\_T50\_absolute\_seconds[i]<-NA  
 df.sum$Trial\_9\_5\_time\_spent\_in\_incorrect\_screen\_T30\_to\_T50\_absolute\_seconds[i]<-NA  
 }  
 else{  
 df.sum$Trial\_9\_5\_correctside[i] <- df.fish.95$correctside  
 df.sum$Trial\_9\_5\_ratio[i] <-df.fish.95$ratio  
 df.sum$Trial\_9\_5\_performance\_over\_full\_4\_minutes\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[i]<- df.fish.95$performancescreen\_full\_4\_minutes  
 df.sum$Trial\_9\_5\_performance\_over\_T30\_to\_T50\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[i]<- df.fish.95$performancescreen\_T30\_to\_T50  
 df.sum$Trial\_9\_5\_was\_performance\_over\_full\_4\_minutes\_greater\_than\_60\_percent[i]<-df.fish.95$perf\_greater\_than\_60\_full\_4\_minutes  
 df.sum$Trial\_9\_5\_was\_performance\_T30\_to\_T50\_greater\_than\_60\_percent[i]<-df.fish.95$perf\_greater\_than\_60\_T30\_to\_T50  
 df.sum$Trial\_9\_5\_reaction\_time[i]<-df.fish.95$reaction\_time  
 df.sum$Trial\_9\_5\_latency\_to\_enter\_correct\_side[i]<-df.fish.95$latency\_enter\_corr  
 df.sum$Trial\_9\_5\_latency\_to\_enter\_correct\_side\_filtered\_just\_correct\_choice[i]<-df.fish.95$latency\_enter\_corr\_filtered\_just\_correct\_choice  
 df.sum$Trial\_9\_5\_latency\_to\_enter\_incorrect\_side[i]<-df.fish.95$latency\_enter\_incorr  
 df.sum$Trial\_9\_5\_screen\_entered\_first[i]<-df.fish.95$screen\_entered\_first  
 df.sum$Trial\_9\_5\_time\_spent\_in\_correct\_screen\_full\_4\_minutes\_absolute\_seconds[i]<- df.fish.95$correctscreen\_full\_4\_minutes\_absolute\_seconds  
 df.sum$Trial\_9\_5\_time\_spent\_in\_incorrect\_screen\_full\_4\_minutes\_absolute\_seconds[i]<-df.fish.95$incorrectscreen\_full\_4\_minutes\_absolute\_seconds  
 df.sum$Trial\_9\_5\_time\_spent\_in\_correct\_screen\_T30\_to\_T50\_absolute\_seconds[i]<-df.fish.95$correctscreen\_T30\_to\_T50\_absolute\_seconds  
 df.sum$Trial\_9\_5\_time\_spent\_in\_incorrect\_screen\_T30\_to\_T50\_absolute\_seconds[i]<-df.fish.95$correctscreen\_T30\_to\_T50\_absolute\_seconds  
 }  
   
 if (nrow(df.fish.101) == 0){  
 df.sum$Trial\_10\_1\_correctside[i] <-NA  
 df.sum$Trial\_10\_1\_ratio[i] <-NA  
 df.sum$Trial\_10\_1\_performance\_over\_full\_4\_minutes\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[i]<-NA  
 df.sum$Trial\_10\_1\_performance\_over\_T30\_to\_T50\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[i]<-NA  
 df.sum$Trial\_10\_1\_was\_performance\_over\_full\_4\_minutes\_greater\_than\_60\_percent[i]<-NA  
 df.sum$Trial\_10\_1\_was\_performance\_T30\_to\_T50\_greater\_than\_60\_percent[i]<-NA   
 df.sum$Trial\_10\_1\_reaction\_time[i]<-NA  
 df.sum$Trial\_10\_1\_latency\_to\_enter\_correct\_side[i]<-NA  
 df.sum$Trial\_10\_1\_latency\_to\_enter\_correct\_side\_filtered\_just\_correct\_choice[i]<-NA  
 df.sum$Trial\_10\_1\_latency\_to\_enter\_incorrect\_side[i]<-NA  
 df.sum$Trial\_10\_1\_screen\_entered\_first[i]<-NA   
 df.sum$Trial\_10\_1\_time\_spent\_in\_correct\_screen\_full\_4\_minutes\_absolute\_seconds[i]<-NA  
 df.sum$Trial\_10\_1\_time\_spent\_in\_incorrect\_screen\_full\_4\_minutes\_absolute\_seconds[i]<-NA  
 df.sum$Trial\_10\_1\_time\_spent\_in\_correct\_screen\_T30\_to\_T50\_absolute\_seconds[i]<-NA  
 df.sum$Trial\_10\_1\_time\_spent\_in\_incorrect\_screen\_T30\_to\_T50\_absolute\_seconds[i]<-NA  
 }  
 else{  
 df.sum$Trial\_10\_1\_correctside[i] <- df.fish.101$correctside  
 df.sum$Trial\_10\_1\_ratio[i] <-df.fish.101$ratio  
 df.sum$Trial\_10\_1\_performance\_over\_full\_4\_minutes\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[i]<- df.fish.101$performancescreen\_full\_4\_minutes  
 df.sum$Trial\_10\_1\_performance\_over\_T30\_to\_T50\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[i]<- df.fish.101$performancescreen\_T30\_to\_T50  
 df.sum$Trial\_10\_1\_was\_performance\_over\_full\_4\_minutes\_greater\_than\_60\_percent[i]<-df.fish.101$perf\_greater\_than\_60\_full\_4\_minutes  
 df.sum$Trial\_10\_1\_was\_performance\_T30\_to\_T50\_greater\_than\_60\_percent[i]<-df.fish.101$perf\_greater\_than\_60\_T30\_to\_T50  
 df.sum$Trial\_10\_1\_reaction\_time[i]<-df.fish.101$reaction\_time  
 df.sum$Trial\_10\_1\_latency\_to\_enter\_correct\_side[i]<-df.fish.101$latency\_enter\_corr  
 df.sum$Trial\_10\_1\_latency\_to\_enter\_correct\_side\_filtered\_just\_correct\_choice[i]<-df.fish.101$latency\_enter\_corr\_filtered\_just\_correct\_choice  
 df.sum$Trial\_10\_1\_latency\_to\_enter\_incorrect\_side[i]<-df.fish.101$latency\_enter\_incorr  
 df.sum$Trial\_10\_1\_screen\_entered\_first[i]<-df.fish.101$screen\_entered\_first  
 df.sum$Trial\_10\_1\_time\_spent\_in\_correct\_screen\_full\_4\_minutes\_absolute\_seconds[i]<- df.fish.101$correctscreen\_full\_4\_minutes\_absolute\_seconds  
 df.sum$Trial\_10\_1\_time\_spent\_in\_incorrect\_screen\_full\_4\_minutes\_absolute\_seconds[i]<-df.fish.101$incorrectscreen\_full\_4\_minutes\_absolute\_seconds  
 df.sum$Trial\_10\_1\_time\_spent\_in\_correct\_screen\_T30\_to\_T50\_absolute\_seconds[i]<-df.fish.101$correctscreen\_T30\_to\_T50\_absolute\_seconds  
 df.sum$Trial\_10\_1\_time\_spent\_in\_incorrect\_screen\_T30\_to\_T50\_absolute\_seconds[i]<-df.fish.101$correctscreen\_T30\_to\_T50\_absolute\_seconds  
 }  
   
 if (nrow(df.fish.103) == 0){  
 df.sum$Trial\_10\_3\_correctside[i] <-NA  
 df.sum$Trial\_10\_3\_ratio[i] <-NA  
 df.sum$Trial\_10\_3\_performance\_over\_full\_4\_minutes\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[i]<-NA  
 df.sum$Trial\_10\_3\_performance\_over\_T30\_to\_T50\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[i]<-NA  
 df.sum$Trial\_10\_3\_was\_performance\_over\_full\_4\_minutes\_greater\_than\_60\_percent[i]<-NA  
 df.sum$Trial\_10\_3\_was\_performance\_T30\_to\_T50\_greater\_than\_60\_percent[i]<-NA   
 df.sum$Trial\_10\_3\_reaction\_time[i]<-NA  
 df.sum$Trial\_10\_3\_latency\_to\_enter\_correct\_side[i]<-NA  
 df.sum$Trial\_10\_3\_latency\_to\_enter\_correct\_side\_filtered\_just\_correct\_choice[i]<-NA  
 df.sum$Trial\_10\_3\_latency\_to\_enter\_incorrect\_side[i]<-NA  
 df.sum$Trial\_10\_3\_screen\_entered\_first[i]<-NA   
 df.sum$Trial\_10\_3\_time\_spent\_in\_correct\_screen\_full\_4\_minutes\_absolute\_seconds[i]<-NA  
 df.sum$Trial\_10\_3\_time\_spent\_in\_incorrect\_screen\_full\_4\_minutes\_absolute\_seconds[i]<-NA  
 df.sum$Trial\_10\_3\_time\_spent\_in\_correct\_screen\_T30\_to\_T50\_absolute\_seconds[i]<-NA  
 df.sum$Trial\_10\_3\_time\_spent\_in\_incorrect\_screen\_T30\_to\_T50\_absolute\_seconds[i]<-NA  
 }  
 else{  
 df.sum$Trial\_10\_3\_correctside[i] <- df.fish.103$correctside  
 df.sum$Trial\_10\_3\_ratio[i] <-df.fish.103$ratio  
 df.sum$Trial\_10\_3\_performance\_over\_full\_4\_minutes\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[i]<- df.fish.103$performancescreen\_full\_4\_minutes  
 df.sum$Trial\_10\_3\_performance\_over\_T30\_to\_T50\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[i]<- df.fish.103$performancescreen\_T30\_to\_T50  
 df.sum$Trial\_10\_3\_was\_performance\_over\_full\_4\_minutes\_greater\_than\_60\_percent[i]<-df.fish.103$perf\_greater\_than\_60\_full\_4\_minutes  
 df.sum$Trial\_10\_3\_was\_performance\_T30\_to\_T50\_greater\_than\_60\_percent[i]<-df.fish.103$perf\_greater\_than\_60\_T30\_to\_T50  
 df.sum$Trial\_10\_3\_reaction\_time[i]<-df.fish.103$reaction\_time  
 df.sum$Trial\_10\_3\_latency\_to\_enter\_correct\_side[i]<-df.fish.103$latency\_enter\_corr  
 df.sum$Trial\_10\_3\_latency\_to\_enter\_correct\_side\_filtered\_just\_correct\_choice[i]<-df.fish.103$latency\_enter\_corr\_filtered\_just\_correct\_choice  
 df.sum$Trial\_10\_3\_latency\_to\_enter\_incorrect\_side[i]<-df.fish.103$latency\_enter\_incorr  
 df.sum$Trial\_10\_3\_screen\_entered\_first[i]<-df.fish.103$screen\_entered\_first  
 df.sum$Trial\_10\_3\_time\_spent\_in\_correct\_screen\_full\_4\_minutes\_absolute\_seconds[i]<- df.fish.103$correctscreen\_full\_4\_minutes\_absolute\_seconds  
 df.sum$Trial\_10\_3\_time\_spent\_in\_incorrect\_screen\_full\_4\_minutes\_absolute\_seconds[i]<-df.fish.103$incorrectscreen\_full\_4\_minutes\_absolute\_seconds  
 df.sum$Trial\_10\_3\_time\_spent\_in\_correct\_screen\_T30\_to\_T50\_absolute\_seconds[i]<-df.fish.103$correctscreen\_T30\_to\_T50\_absolute\_seconds  
 df.sum$Trial\_10\_3\_time\_spent\_in\_incorrect\_screen\_T30\_to\_T50\_absolute\_seconds[i]<-df.fish.103$correctscreen\_T30\_to\_T50\_absolute\_seconds  
 }  
   
 if (nrow(df.fish.105) == 0){  
 df.sum$Trial\_10\_5\_correctside[i] <-NA  
 df.sum$Trial\_10\_5\_ratio[i] <-NA  
 df.sum$Trial\_10\_5\_performance\_over\_full\_4\_minutes\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[i]<-NA  
 df.sum$Trial\_10\_5\_performance\_over\_T30\_to\_T50\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[i]<-NA  
 df.sum$Trial\_10\_5\_was\_performance\_over\_full\_4\_minutes\_greater\_than\_60\_percent[i]<-NA  
 df.sum$Trial\_10\_5\_was\_performance\_T30\_to\_T50\_greater\_than\_60\_percent[i]<-NA   
 df.sum$Trial\_10\_5\_reaction\_time[i]<-NA  
 df.sum$Trial\_10\_5\_latency\_to\_enter\_correct\_side[i]<-NA  
 df.sum$Trial\_10\_5\_latency\_to\_enter\_correct\_side\_filtered\_just\_correct\_choice[i]<-NA  
 df.sum$Trial\_10\_5\_latency\_to\_enter\_incorrect\_side[i]<-NA  
 df.sum$Trial\_10\_5\_screen\_entered\_first[i]<-NA  
 df.sum$Trial\_10\_5\_time\_spent\_in\_correct\_screen\_full\_4\_minutes\_absolute\_seconds[i]<-NA  
 df.sum$Trial\_10\_5\_time\_spent\_in\_incorrect\_screen\_full\_4\_minutes\_absolute\_seconds[i]<-NA  
 df.sum$Trial\_10\_5\_time\_spent\_in\_correct\_screen\_T30\_to\_T50\_absolute\_seconds[i]<-NA  
 df.sum$Trial\_10\_5\_time\_spent\_in\_incorrect\_screen\_T30\_to\_T50\_absolute\_seconds[i]<-NA  
 }  
 else{  
 df.sum$Trial\_10\_5\_correctside[i] <- df.fish.105$correctside  
 df.sum$Trial\_10\_5\_ratio[i] <-df.fish.105$ratio  
 df.sum$Trial\_10\_5\_performance\_over\_full\_4\_minutes\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[i]<- df.fish.105$performancescreen\_full\_4\_minutes  
 df.sum$Trial\_10\_5\_performance\_over\_T30\_to\_T50\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[i]<- df.fish.105$performancescreen\_T30\_to\_T50  
 df.sum$Trial\_10\_5\_was\_performance\_over\_full\_4\_minutes\_greater\_than\_60\_percent[i]<-df.fish.105$perf\_greater\_than\_60\_full\_4\_minutes  
 df.sum$Trial\_10\_5\_was\_performance\_T30\_to\_T50\_greater\_than\_60\_percent[i]<-df.fish.105$perf\_greater\_than\_60\_T30\_to\_T50  
 df.sum$Trial\_10\_5\_reaction\_time[i]<-df.fish.105$reaction\_time  
 df.sum$Trial\_10\_5\_latency\_to\_enter\_correct\_side[i]<-df.fish.105$latency\_enter\_corr  
 df.sum$Trial\_10\_5\_latency\_to\_enter\_correct\_side\_filtered\_just\_correct\_choice[i]<-df.fish.105$latency\_enter\_corr\_filtered\_just\_correct\_choice  
 df.sum$Trial\_10\_5\_latency\_to\_enter\_incorrect\_side[i]<-df.fish.105$latency\_enter\_incorr  
 df.sum$Trial\_10\_5\_screen\_entered\_first[i]<-df.fish.105$screen\_entered\_first  
 df.sum$Trial\_10\_5\_time\_spent\_in\_correct\_screen\_full\_4\_minutes\_absolute\_seconds[i]<- df.fish.105$correctscreen\_full\_4\_minutes\_absolute\_seconds  
 df.sum$Trial\_10\_5\_time\_spent\_in\_incorrect\_screen\_full\_4\_minutes\_absolute\_seconds[i]<-df.fish.105$incorrectscreen\_full\_4\_minutes\_absolute\_seconds  
 df.sum$Trial\_10\_5\_time\_spent\_in\_correct\_screen\_T30\_to\_T50\_absolute\_seconds[i]<-df.fish.105$correctscreen\_T30\_to\_T50\_absolute\_seconds  
 df.sum$Trial\_10\_5\_time\_spent\_in\_incorrect\_screen\_T30\_to\_T50\_absolute\_seconds[i]<-df.fish.105$correctscreen\_T30\_to\_T50\_absolute\_seconds  
 }  
   
 if (nrow(df.fish.111) == 0){  
 df.sum$Trial\_11\_1\_correctside[i] <-NA  
 df.sum$Trial\_11\_1\_ratio[i] <-NA  
 df.sum$Trial\_11\_1\_performance\_over\_full\_4\_minutes\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[i]<-NA  
 df.sum$Trial\_11\_1\_performance\_over\_T30\_to\_T50\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[i]<-NA  
 df.sum$Trial\_11\_1\_was\_performance\_over\_full\_4\_minutes\_greater\_than\_60\_percent[i]<-NA  
 df.sum$Trial\_11\_1\_was\_performance\_T30\_to\_T50\_greater\_than\_60\_percent[i]<-NA   
 df.sum$Trial\_11\_1\_reaction\_time[i]<-NA  
 df.sum$Trial\_11\_1\_latency\_to\_enter\_correct\_side[i]<-NA  
 df.sum$Trial\_11\_1\_latency\_to\_enter\_correct\_side\_filtered\_just\_correct\_choice[i]<-NA  
 df.sum$Trial\_11\_1\_latency\_to\_enter\_incorrect\_side[i]<-NA  
 df.sum$Trial\_11\_1\_screen\_entered\_first[i]<-NA   
 df.sum$Trial\_11\_1\_time\_spent\_in\_correct\_screen\_full\_4\_minutes\_absolute\_seconds[i]<-NA  
 df.sum$Trial\_11\_1\_time\_spent\_in\_incorrect\_screen\_full\_4\_minutes\_absolute\_seconds[i]<-NA  
 df.sum$Trial\_11\_1\_time\_spent\_in\_correct\_screen\_T30\_to\_T50\_absolute\_seconds[i]<-NA  
 df.sum$Trial\_11\_1\_time\_spent\_in\_incorrect\_screen\_T30\_to\_T50\_absolute\_seconds[i]<-NA  
 }  
 else{  
 df.sum$Trial\_11\_1\_correctside[i] <- df.fish.111$correctside  
 df.sum$Trial\_11\_1\_ratio[i] <-df.fish.111$ratio  
 df.sum$Trial\_11\_1\_performance\_over\_full\_4\_minutes\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[i]<- df.fish.111$performancescreen\_full\_4\_minutes  
 df.sum$Trial\_11\_1\_performance\_over\_T30\_to\_T50\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[i]<- df.fish.111$performancescreen\_T30\_to\_T50  
 df.sum$Trial\_11\_1\_was\_performance\_over\_full\_4\_minutes\_greater\_than\_60\_percent[i]<-df.fish.111$perf\_greater\_than\_60\_full\_4\_minutes  
 df.sum$Trial\_11\_1\_was\_performance\_T30\_to\_T50\_greater\_than\_60\_percent[i]<-df.fish.111$perf\_greater\_than\_60\_T30\_to\_T50  
 df.sum$Trial\_11\_1\_reaction\_time[i]<-df.fish.111$reaction\_time  
 df.sum$Trial\_11\_1\_latency\_to\_enter\_correct\_side[i]<-df.fish.111$latency\_enter\_corr  
 df.sum$Trial\_11\_1\_latency\_to\_enter\_correct\_side\_filtered\_just\_correct\_choice[i]<-df.fish.111$latency\_enter\_corr\_filtered\_just\_correct\_choice  
 df.sum$Trial\_11\_1\_latency\_to\_enter\_incorrect\_side[i]<-df.fish.111$latency\_enter\_incorr  
 df.sum$Trial\_11\_1\_screen\_entered\_first[i]<-df.fish.111$screen\_entered\_first  
 df.sum$Trial\_11\_1\_time\_spent\_in\_correct\_screen\_full\_4\_minutes\_absolute\_seconds[i]<- df.fish.111$correctscreen\_full\_4\_minutes\_absolute\_seconds  
 df.sum$Trial\_11\_1\_time\_spent\_in\_incorrect\_screen\_full\_4\_minutes\_absolute\_seconds[i]<-df.fish.111$incorrectscreen\_full\_4\_minutes\_absolute\_seconds  
 df.sum$Trial\_11\_1\_time\_spent\_in\_correct\_screen\_T30\_to\_T50\_absolute\_seconds[i]<-df.fish.111$correctscreen\_T30\_to\_T50\_absolute\_seconds  
 df.sum$Trial\_11\_1\_time\_spent\_in\_incorrect\_screen\_T30\_to\_T50\_absolute\_seconds[i]<-df.fish.111$correctscreen\_T30\_to\_T50\_absolute\_seconds  
 }  
   
 if (nrow(df.fish.113) == 0){  
 df.sum$Trial\_11\_3\_correctside[i] <-NA  
 df.sum$Trial\_11\_3\_ratio[i] <-NA  
 df.sum$Trial\_11\_3\_performance\_over\_full\_4\_minutes\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[i]<-NA  
 df.sum$Trial\_11\_3\_performance\_over\_T30\_to\_T50\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[i]<-NA  
 df.sum$Trial\_11\_3\_was\_performance\_over\_full\_4\_minutes\_greater\_than\_60\_percent[i]<-NA  
 df.sum$Trial\_11\_3\_was\_performance\_T30\_to\_T50\_greater\_than\_60\_percent[i]<-NA   
 df.sum$Trial\_11\_3\_reaction\_time[i]<-NA  
 df.sum$Trial\_11\_3\_latency\_to\_enter\_correct\_side[i]<-NA  
 df.sum$Trial\_11\_3\_latency\_to\_enter\_correct\_side\_filtered\_just\_correct\_choice[i]<-NA  
 df.sum$Trial\_11\_3\_latency\_to\_enter\_incorrect\_side[i]<-NA  
 df.sum$Trial\_11\_3\_screen\_entered\_first[i]<-NA   
 df.sum$Trial\_11\_3\_time\_spent\_in\_correct\_screen\_full\_4\_minutes\_absolute\_seconds[i]<-NA  
 df.sum$Trial\_11\_3\_time\_spent\_in\_incorrect\_screen\_full\_4\_minutes\_absolute\_seconds[i]<-NA  
 df.sum$Trial\_11\_3\_time\_spent\_in\_correct\_screen\_T30\_to\_T50\_absolute\_seconds[i]<-NA  
 df.sum$Trial\_11\_3\_time\_spent\_in\_incorrect\_screen\_T30\_to\_T50\_absolute\_seconds[i]<-NA  
 }  
 else{  
 df.sum$Trial\_11\_3\_correctside[i] <- df.fish.113$correctside  
 df.sum$Trial\_11\_3\_ratio[i] <-df.fish.113$ratio  
 df.sum$Trial\_11\_3\_performance\_over\_full\_4\_minutes\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[i]<- df.fish.113$performancescreen\_full\_4\_minutes  
 df.sum$Trial\_11\_3\_performance\_over\_T30\_to\_T50\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[i]<- df.fish.113$performancescreen\_T30\_to\_T50  
 df.sum$Trial\_11\_3\_was\_performance\_over\_full\_4\_minutes\_greater\_than\_60\_percent[i]<-df.fish.113$perf\_greater\_than\_60\_full\_4\_minutes  
 df.sum$Trial\_11\_3\_was\_performance\_T30\_to\_T50\_greater\_than\_60\_percent[i]<-df.fish.113$perf\_greater\_than\_60\_T30\_to\_T50  
 df.sum$Trial\_11\_3\_reaction\_time[i]<-df.fish.113$reaction\_time  
 df.sum$Trial\_11\_3\_latency\_to\_enter\_correct\_side[i]<-df.fish.113$latency\_enter\_corr  
 df.sum$Trial\_11\_3\_latency\_to\_enter\_correct\_side\_filtered\_just\_correct\_choice[i]<-df.fish.113$latency\_enter\_corr\_filtered\_just\_correct\_choice  
 df.sum$Trial\_11\_3\_latency\_to\_enter\_incorrect\_side[i]<-df.fish.113$latency\_enter\_incorr  
 df.sum$Trial\_11\_3\_screen\_entered\_first[i]<-df.fish.113$screen\_entered\_first  
 df.sum$Trial\_11\_3\_time\_spent\_in\_correct\_screen\_full\_4\_minutes\_absolute\_seconds[i]<- df.fish.113$correctscreen\_full\_4\_minutes\_absolute\_seconds  
 df.sum$Trial\_11\_3\_time\_spent\_in\_incorrect\_screen\_full\_4\_minutes\_absolute\_seconds[i]<-df.fish.113$incorrectscreen\_full\_4\_minutes\_absolute\_seconds  
 df.sum$Trial\_11\_3\_time\_spent\_in\_correct\_screen\_T30\_to\_T50\_absolute\_seconds[i]<-df.fish.113$correctscreen\_T30\_to\_T50\_absolute\_seconds  
 df.sum$Trial\_11\_3\_time\_spent\_in\_incorrect\_screen\_T30\_to\_T50\_absolute\_seconds[i]<-df.fish.113$correctscreen\_T30\_to\_T50\_absolute\_seconds  
 }  
   
 if (nrow(df.fish.115) == 0){  
 df.sum$Trial\_11\_5\_correctside[i] <-NA  
 df.sum$Trial\_11\_5\_ratio[i] <-NA  
 df.sum$Trial\_11\_5\_performance\_over\_full\_4\_minutes\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[i]<-NA  
 df.sum$Trial\_11\_5\_performance\_over\_T30\_to\_T50\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[i]<-NA  
 df.sum$Trial\_11\_5\_was\_performance\_over\_full\_4\_minutes\_greater\_than\_60\_percent[i]<-NA  
 df.sum$Trial\_11\_5\_was\_performance\_T30\_to\_T50\_greater\_than\_60\_percent[i]<-NA   
 df.sum$Trial\_11\_5\_reaction\_time[i]<-NA  
 df.sum$Trial\_11\_5\_latency\_to\_enter\_correct\_side[i]<-NA  
 df.sum$Trial\_11\_5\_latency\_to\_enter\_correct\_side\_filtered\_just\_correct\_choice[i]<-NA  
 df.sum$Trial\_11\_5\_latency\_to\_enter\_incorrect\_side[i]<-NA  
 df.sum$Trial\_11\_5\_screen\_entered\_first[i]<-NA   
 df.sum$Trial\_11\_5\_time\_spent\_in\_correct\_screen\_full\_4\_minutes\_absolute\_seconds[i]<-NA  
 df.sum$Trial\_11\_5\_time\_spent\_in\_incorrect\_screen\_full\_4\_minutes\_absolute\_seconds[i]<-NA  
 df.sum$Trial\_11\_5\_time\_spent\_in\_correct\_screen\_T30\_to\_T50\_absolute\_seconds[i]<-NA  
 df.sum$Trial\_11\_5\_time\_spent\_in\_incorrect\_screen\_T30\_to\_T50\_absolute\_seconds[i]<-NA  
 }  
 else{  
 df.sum$Trial\_11\_5\_correctside[i] <- df.fish.115$correctside  
 df.sum$Trial\_11\_5\_ratio[i] <-df.fish.115$ratio  
 df.sum$Trial\_11\_5\_performance\_over\_full\_4\_minutes\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[i]<- df.fish.115$performancescreen\_full\_4\_minutes  
 df.sum$Trial\_11\_5\_performance\_over\_T30\_to\_T50\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[i]<- df.fish.115$performancescreen\_T30\_to\_T50  
 df.sum$Trial\_11\_5\_was\_performance\_over\_full\_4\_minutes\_greater\_than\_60\_percent[i]<-df.fish.115$perf\_greater\_than\_60\_full\_4\_minutes  
 df.sum$Trial\_11\_5\_was\_performance\_T30\_to\_T50\_greater\_than\_60\_percent[i]<-df.fish.115$perf\_greater\_than\_60\_T30\_to\_T50  
 df.sum$Trial\_11\_5\_reaction\_time[i]<-df.fish.115$reaction\_time  
 df.sum$Trial\_11\_5\_latency\_to\_enter\_correct\_side[i]<-df.fish.115$latency\_enter\_corr  
 df.sum$Trial\_11\_5\_latency\_to\_enter\_correct\_side\_filtered\_just\_correct\_choice[i]<-df.fish.115$latency\_enter\_corr\_filtered\_just\_correct\_choice  
 df.sum$Trial\_11\_5\_latency\_to\_enter\_incorrect\_side[i]<-df.fish.115$latency\_enter\_incorr  
 df.sum$Trial\_11\_5\_screen\_entered\_first[i]<-df.fish.115$screen\_entered\_first  
 df.sum$Trial\_11\_5\_time\_spent\_in\_correct\_screen\_full\_4\_minutes\_absolute\_seconds[i]<- df.fish.115$correctscreen\_full\_4\_minutes\_absolute\_seconds  
 df.sum$Trial\_11\_5\_time\_spent\_in\_incorrect\_screen\_full\_4\_minutes\_absolute\_seconds[i]<-df.fish.115$incorrectscreen\_full\_4\_minutes\_absolute\_seconds  
 df.sum$Trial\_11\_5\_time\_spent\_in\_correct\_screen\_T30\_to\_T50\_absolute\_seconds[i]<-df.fish.115$correctscreen\_T30\_to\_T50\_absolute\_seconds  
 df.sum$Trial\_11\_5\_time\_spent\_in\_incorrect\_screen\_T30\_to\_T50\_absolute\_seconds[i]<-df.fish.115$correctscreen\_T30\_to\_T50\_absolute\_seconds  
 }  
}

#flag trials where fish was already in the correct side when the trial started at T30 (1 means it started in the correct zone)   
  
 for(i in 1:nrow(df.sum)){   
 if(is.na(df.sum$Trial\_9\_1\_latency\_to\_enter\_correct\_side[i]) == TRUE){  
 df.sum$Trial\_9\_1\_was\_fish\_in\_correct\_screen\_at\_start[i]<- NA}  
 else if(df.sum$Trial\_9\_1\_latency\_to\_enter\_correct\_side[i] == 0){  
 df.sum$Trial\_9\_1\_was\_fish\_in\_correct\_screen\_at\_start[i]<- 1}  
 else{  
 df.sum$Trial\_9\_1\_was\_fish\_in\_correct\_screen\_at\_start[i]<-0}  
   
 if(is.na(df.sum$Trial\_9\_3\_latency\_to\_enter\_correct\_side[i]) == TRUE){  
 df.sum$Trial\_9\_3\_was\_fish\_in\_correct\_screen\_at\_start[i]<- NA}  
 else if(df.sum$Trial\_9\_3\_latency\_to\_enter\_correct\_side[i] == 0){  
 df.sum$Trial\_9\_3\_was\_fish\_in\_correct\_screen\_at\_start[i]<- 1}  
 else{  
 df.sum$Trial\_9\_3\_was\_fish\_in\_correct\_screen\_at\_start[i]<-0}  
   
 if(is.na(df.sum$Trial\_9\_5\_latency\_to\_enter\_correct\_side[i]) == TRUE){  
 df.sum$Trial\_9\_5\_was\_fish\_in\_correct\_screen\_at\_start[i]<- NA}  
 else if(df.sum$Trial\_9\_5\_latency\_to\_enter\_correct\_side[i] == 0){  
 df.sum$Trial\_9\_5\_was\_fish\_in\_correct\_screen\_at\_start[i]<- 1}  
 else{  
 df.sum$Trial\_9\_5\_was\_fish\_in\_correct\_screen\_at\_start[i]<-0}  
   
 if(is.na(df.sum$Trial\_10\_1\_latency\_to\_enter\_correct\_side[i]) == TRUE){  
 df.sum$Trial\_10\_1\_was\_fish\_in\_correct\_screen\_at\_start[i]<- NA}  
 else if(df.sum$Trial\_10\_1\_latency\_to\_enter\_correct\_side[i] == 0){  
 df.sum$Trial\_10\_1\_was\_fish\_in\_correct\_screen\_at\_start[i]<- 1}  
 else{  
 df.sum$Trial\_10\_1\_was\_fish\_in\_correct\_screen\_at\_start[i]<-0}   
   
 if(is.na(df.sum$Trial\_10\_3\_latency\_to\_enter\_correct\_side[i]) == TRUE){  
 df.sum$Trial\_10\_3\_was\_fish\_in\_correct\_screen\_at\_start[i]<- NA}  
 else if(df.sum$Trial\_10\_3\_latency\_to\_enter\_correct\_side[i] == 0){  
 df.sum$Trial\_10\_3\_was\_fish\_in\_correct\_screen\_at\_start[i]<- 1}  
 else{  
 df.sum$Trial\_10\_3\_was\_fish\_in\_correct\_screen\_at\_start[i]<-0}   
  
 if(is.na(df.sum$Trial\_10\_5\_latency\_to\_enter\_correct\_side[i]) == TRUE){  
 df.sum$Trial\_10\_5\_was\_fish\_in\_correct\_screen\_at\_start[i]<- NA}  
 else if(df.sum$Trial\_10\_5\_latency\_to\_enter\_correct\_side[i] == 0){  
 df.sum$Trial\_10\_5\_was\_fish\_in\_correct\_screen\_at\_start[i]<- 1}  
 else{  
 df.sum$Trial\_10\_5\_was\_fish\_in\_correct\_screen\_at\_start[i]<-0}   
   
 if(is.na(df.sum$Trial\_11\_1\_latency\_to\_enter\_correct\_side[i]) == TRUE){  
 df.sum$Trial\_11\_1\_was\_fish\_in\_correct\_screen\_at\_start[i]<- NA}  
 else if(df.sum$Trial\_11\_1\_latency\_to\_enter\_correct\_side[i] == 0){  
 df.sum$Trial\_11\_1\_was\_fish\_in\_correct\_screen\_at\_start[i]<- 1}  
 else{  
 df.sum$Trial\_11\_1\_was\_fish\_in\_correct\_screen\_at\_start[i]<-0}   
   
 if(is.na(df.sum$Trial\_11\_3\_latency\_to\_enter\_correct\_side[i]) == TRUE){  
 df.sum$Trial\_11\_3\_was\_fish\_in\_correct\_screen\_at\_start[i]<- NA}  
 else if(df.sum$Trial\_11\_3\_latency\_to\_enter\_correct\_side[i] == 0){  
 df.sum$Trial\_11\_3\_was\_fish\_in\_correct\_screen\_at\_start[i]<- 1}  
 else{  
 df.sum$Trial\_11\_3\_was\_fish\_in\_correct\_screen\_at\_start[i]<-0}   
  
 if(is.na(df.sum$Trial\_11\_5\_latency\_to\_enter\_correct\_side[i]) == TRUE){  
 df.sum$Trial\_11\_5\_was\_fish\_in\_correct\_screen\_at\_start[i]<- NA}  
 else if(df.sum$Trial\_11\_5\_latency\_to\_enter\_correct\_side[i] == 0){  
 df.sum$Trial\_11\_5\_was\_fish\_in\_correct\_screen\_at\_start[i]<- 1}  
 else{  
 df.sum$Trial\_11\_5\_was\_fish\_in\_correct\_screen\_at\_start[i]<-0}   
 }

#removing trials where the fish was already in the correct side at T30- I'm hard coding this for now because there are only three trials  
  
  
#CHANGE THESE THREE  
 df.sum$Trial\_10\_3\_correctside[20] <-NA  
 df.sum$Trial\_10\_3\_ratio[35] <-NA  
 df.sum$Trial\_10\_3\_performance\_over\_full\_4\_minutes\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[35]<-NA  
 df.sum$Trial\_10\_3\_performance\_over\_T30\_to\_T50\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[35]<-NA  
 df.sum$Trial\_10\_3\_was\_performance\_over\_full\_4\_minutes\_greater\_than\_60\_percent[35]<-NA  
 df.sum$Trial\_10\_3\_was\_performance\_T30\_to\_T50\_greater\_than\_60\_percent[35]<-NA   
 df.sum$Trial\_10\_3\_reaction\_time[35]<-NA  
 df.sum$Trial\_10\_3\_latency\_to\_enter\_correct\_side[35]<-NA  
 df.sum$Trial\_10\_3\_latency\_to\_enter\_correct\_side\_filtered\_just\_correct\_choice[35]<-NA  
 df.sum$Trial\_10\_3\_latency\_to\_enter\_incorrect\_side[35]<-NA  
 df.sum$Trial\_10\_3\_screen\_entered\_first[35]<-NA   
 df.sum$Trial\_10\_3\_time\_spent\_in\_correct\_screen\_full\_4\_minutes\_absolute\_seconds[35]<-NA  
 df.sum$Trial\_10\_3\_time\_spent\_in\_incorrect\_screen\_full\_4\_minutes\_absolute\_seconds[35]<-NA  
 df.sum$Trial\_10\_3\_time\_spent\_in\_correct\_screen\_T30\_to\_T50\_absolute\_seconds[35]<-NA  
 df.sum$Trial\_10\_3\_time\_spent\_in\_incorrect\_screen\_T30\_to\_T50\_absolute\_seconds[35]<-NA  
   
   
 df.sum$Trial\_10\_5\_correctside[20] <-NA  
 df.sum$Trial\_10\_5\_ratio[20] <-NA  
 df.sum$Trial\_10\_5\_performance\_over\_full\_4\_minutes\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[20]<-NA  
 df.sum$Trial\_10\_5\_performance\_over\_T30\_to\_T50\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[20]<-NA  
 df.sum$Trial\_10\_5\_was\_performance\_over\_full\_4\_minutes\_greater\_than\_60\_percent[20]<-NA  
 df.sum$Trial\_10\_5\_was\_performance\_T30\_to\_T50\_greater\_than\_60\_percent[20]<-NA   
 df.sum$Trial\_10\_5\_reaction\_time[20]<-NA  
 df.sum$Trial\_10\_5\_latency\_to\_enter\_correct\_side[20]<-NA  
 df.sum$Trial\_10\_5\_latency\_to\_enter\_correct\_side\_filtered\_just\_correct\_choice[20]<-NA  
 df.sum$Trial\_10\_5\_latency\_to\_enter\_incorrect\_side[20]<-NA  
 df.sum$Trial\_10\_5\_screen\_entered\_first[20]<-NA   
 df.sum$Trial\_10\_5\_time\_spent\_in\_correct\_screen\_full\_4\_minutes\_absolute\_seconds[20]<-NA  
 df.sum$Trial\_10\_5\_time\_spent\_in\_incorrect\_screen\_full\_4\_minutes\_absolute\_seconds[20]<-NA  
 df.sum$Trial\_10\_5\_time\_spent\_in\_correct\_screen\_T30\_to\_T50\_absolute\_seconds[20]<-NA  
 df.sum$Trial\_10\_5\_time\_spent\_in\_incorrect\_screen\_T30\_to\_T50\_absolute\_seconds[20]<-NA  
   
   
 df.sum$Trial\_11\_5\_correctside[13] <-NA  
 df.sum$Trial\_11\_5\_ratio[13] <-NA  
 df.sum$Trial\_11\_5\_performance\_over\_full\_4\_minutes\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[13]<-NA  
 df.sum$Trial\_11\_5\_performance\_over\_T30\_to\_T50\_ie\_correct\_screen\_proportion\_divided\_by\_sum\_proportion\_at\_both\_screens[13]<-NA  
 df.sum$Trial\_11\_5\_was\_performance\_over\_full\_4\_minutes\_greater\_than\_60\_percent[13]<-NA  
 df.sum$Trial\_11\_5\_was\_performance\_T30\_to\_T50\_greater\_than\_60\_percent[13]<-NA   
 df.sum$Trial\_11\_5\_reaction\_time[13]<-NA  
 df.sum$Trial\_11\_5\_latency\_to\_enter\_correct\_side[13]<-NA  
 df.sum$Trial\_11\_5\_latency\_to\_enter\_correct\_side\_filtered\_just\_correct\_choice[13]<-NA  
 df.sum$Trial\_11\_5\_latency\_to\_enter\_incorrect\_side[13]<-NA  
 df.sum$Trial\_11\_5\_screen\_entered\_first[13]<-NA   
 df.sum$Trial\_11\_5\_time\_spent\_in\_correct\_screen\_full\_4\_minutes\_absolute\_seconds[13]<-NA  
 df.sum$Trial\_11\_5\_time\_spent\_in\_incorrect\_screen\_full\_4\_minutes\_absolute\_seconds[13]<-NA  
 df.sum$Trial\_11\_5\_time\_spent\_in\_correct\_screen\_T30\_to\_T50\_absolute\_seconds[13]<-NA  
 df.sum$Trial\_11\_5\_time\_spent\_in\_incorrect\_screen\_T30\_to\_T50\_absolute\_seconds[13]<-NA