Deslorelin SICB paper

R Markdown

This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see http://rmarkdown.rstudio.com.

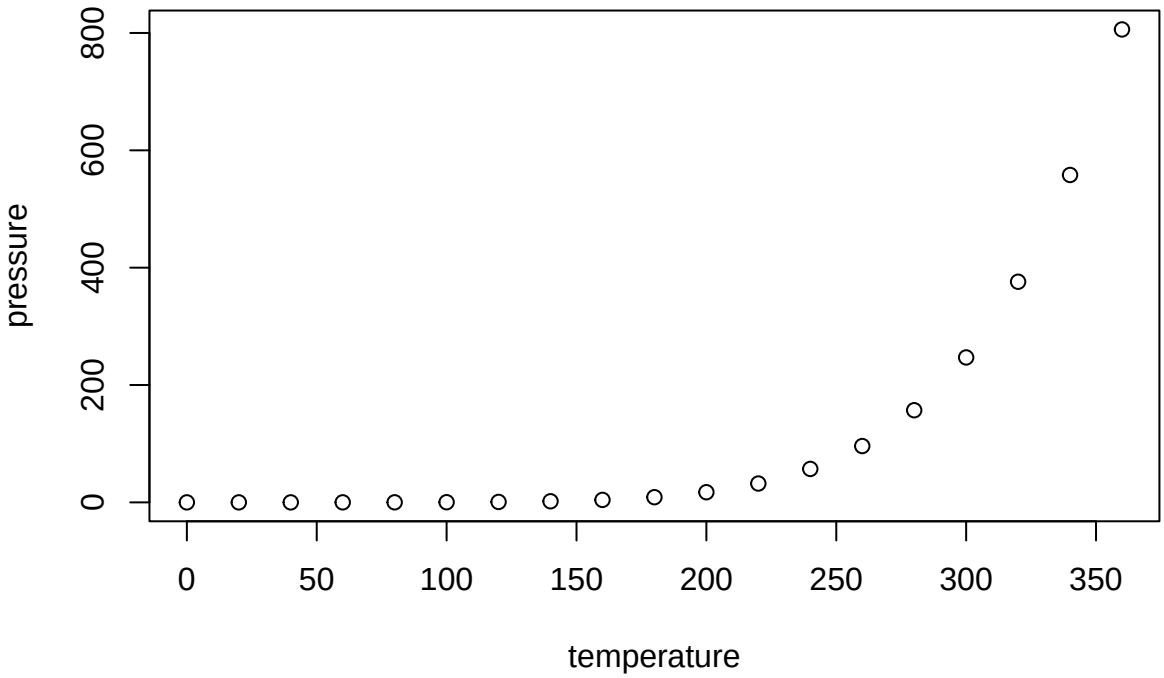
When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
summary(cars)
```

```
##      speed           dist
##  Min.   : 4.0   Min.   :  2.00
##  1st Qu.:12.0   1st Qu.: 26.00
##  Median :15.0   Median : 36.00
##  Mean   :15.4   Mean   : 42.98
##  3rd Qu.:19.0   3rd Qu.: 56.00
##  Max.   :25.0   Max.   :120.00
```

Including Plots

You can also embed plots, for example:



Note that the `echo = FALSE` parameter was added to the code chunk to prevent printing of the R code that generated the plot.

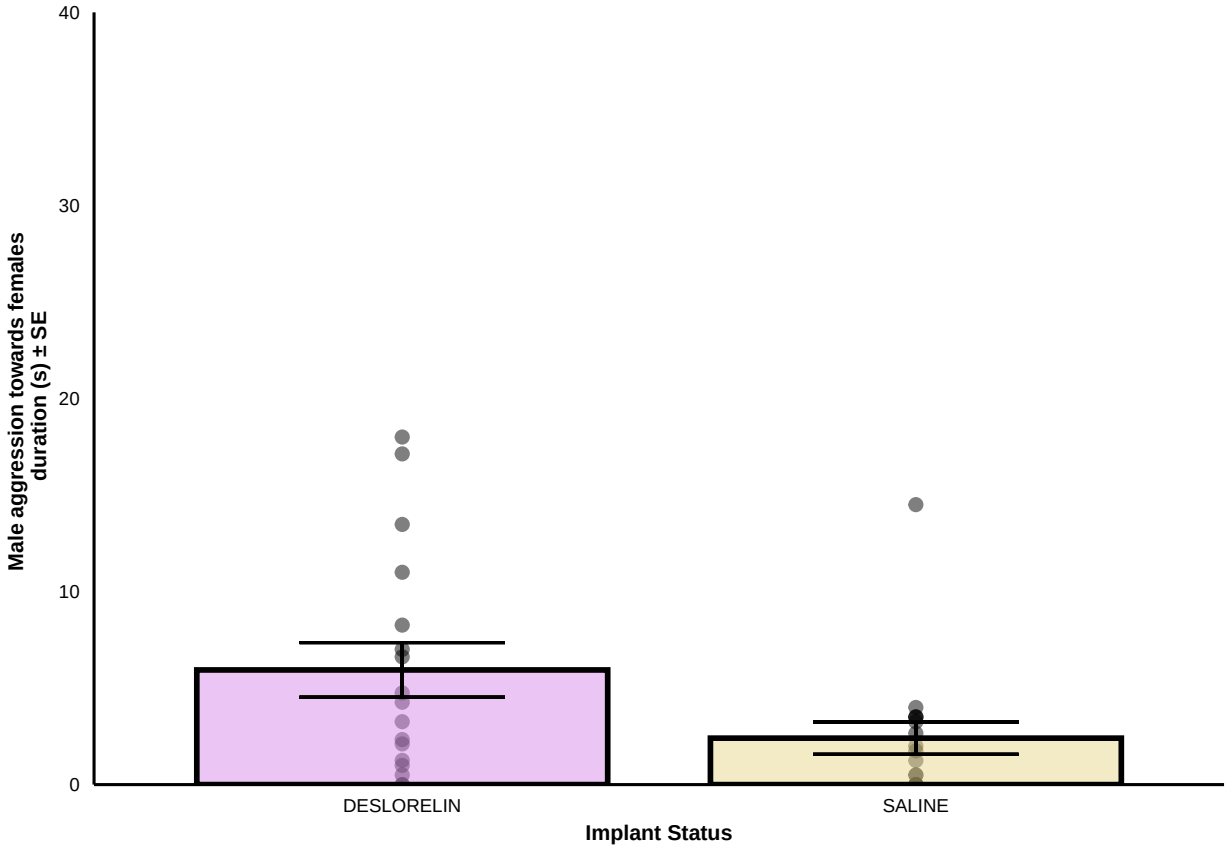
```
AMITdata <-read.csv("BEVdata.csv")
summary(AMITdata)
```

```
##       Date              Trial              ID                 Sex
##  Min.   :2142020   Min.   :1502020   Length:72          Length:72
##  1st Qu.:2292020   1st Qu.:1509355   Class :character   Class :character
##  Median :3162020   Median :1510726   Mode  :character   Mode  :character
##  Mean   :4092020   Mean   :1510331
##  3rd Qu.:6302020   3rd Qu.:1512013
##  Max.   :7102020   Max.   :1513924
##     Status          Aggression.dur     Aggression.n      Sniff.dur
##  Length:72          Min.   : 0.0000   Min.   : 0.000   Min.   :  1.50
##  Class :character   1st Qu.: 0.5008   1st Qu.: 1.000   1st Qu.: 36.19
##  Mode  :character   Median : 3.2555   Median : 3.500   Median : 60.88
##                     Mean   : 6.3406   Mean   : 7.972   Mean   : 71.30
##                     3rd Qu.:11.0610   3rd Qu.:12.000   3rd Qu.: 96.96
##                     Max.   :36.1730   Max.   :50.000   Max.   :246.49
##     Sniff.n      Total.time.w.male    X               X.1
##  Min.   : 1.00   Min.   :  2.252   Mode:logical   Length:72
##  1st Qu.:10.25   1st Qu.:123.369   NA's:72        Class :character
##  Median :18.00   Median :209.984                  Mode  :character
##  Mean   :21.32   Mean   :239.998
##  3rd Qu.:32.00   3rd Qu.:295.865
##  Max.   :70.00   Max.   :951.217
```

```
AMITdata$Trial <- as.factor(AMITdata$Trial)
AMITdata$Sex <- as.factor(AMITdata$Sex)
AMITdata$ID <- as.factor(AMITdata$ID)
AMITdata$Status <- as.factor(AMITdata$Status)
AMITdata$PercentAGG <- AMITdata$Aggression.dur/AMITdata$Total.time.w.male*100
AMITdata$PercentPOS <- AMITdata$Sniff.dur/AMITdata$Total.time.w.male*100

#Remove one trial where both females were saline-treated (human error)
AMITdata <-AMITdata[!(AMITdata$Trial=="1510959"),]

### First plot, Male aggression towards females ###
plotdata <- AMITdata %>% filter(ID=="Male") %>% group_by(Status) %>% mutate(meanagg = mean(Aggression.du

aggplot1 <- ggplot(plotdata, aes(x=Status, y=Aggression.dur, fill= Status)) +
  scale_y_continuous(expand= c(0,0), limits = c(0, 40)) +
  #coord_cartesian(ylim = c(0, 10)) +
  geom_jitter(aes(color = (as.factor(Status))), size = 2, position=position_dodge(width=0.9), alpha=0.5)
  geom_bar(aes(color = as.factor(Status)), alpha = .5,
           width=0.8,
           stat="summary", size = 1, position="dodge") +
  geom_errorbar(aes(ymin=meanagg-stanaggerr, ymax=meanagg+stanaggerr, color = as.factor(Status)), width=
                position=position_dodge(.9)) +
  labs(x = "Implant Status", y="Male aggression towards females \n duration (s) ± SE")+ #Axes labels
  theme_alex() +
  scale_fill_manual(values=c(COLOR1, COLOR2)) + #colors in hexadecimal
  scale_color_manual(values=c("Black", "Black")) + #colors in hexadecimal
  # annotate("segment", x = 1, xend = 4, y = 40, yend = 40, colour = "black", size=1, alpha=1) +
  #annotate("text", x = 2.5, y = 41.5, size =6, label = "**") +
  #annotate("segment", x = 1, xend = 3, y = 35, yend = 35, colour = "black", size=1, alpha=1) +
  #annotate("text", x = 2, y = 36.5, size =6, label = "*") +
  guides(fill="none", color = "none") +
  theme(legend.title=element_text(size=8, face="bold"),
```

```
        legend.text = element_text(size=8),
        axis.text = element_text(size=7, colour="black"),
        axis.title=element_text(size=8,face="bold"),
        axis.line = element_line(colour = "black"),
        panel.border = element_blank(),
        legend.position = "right"
  )
aggplot1 #show plot
```

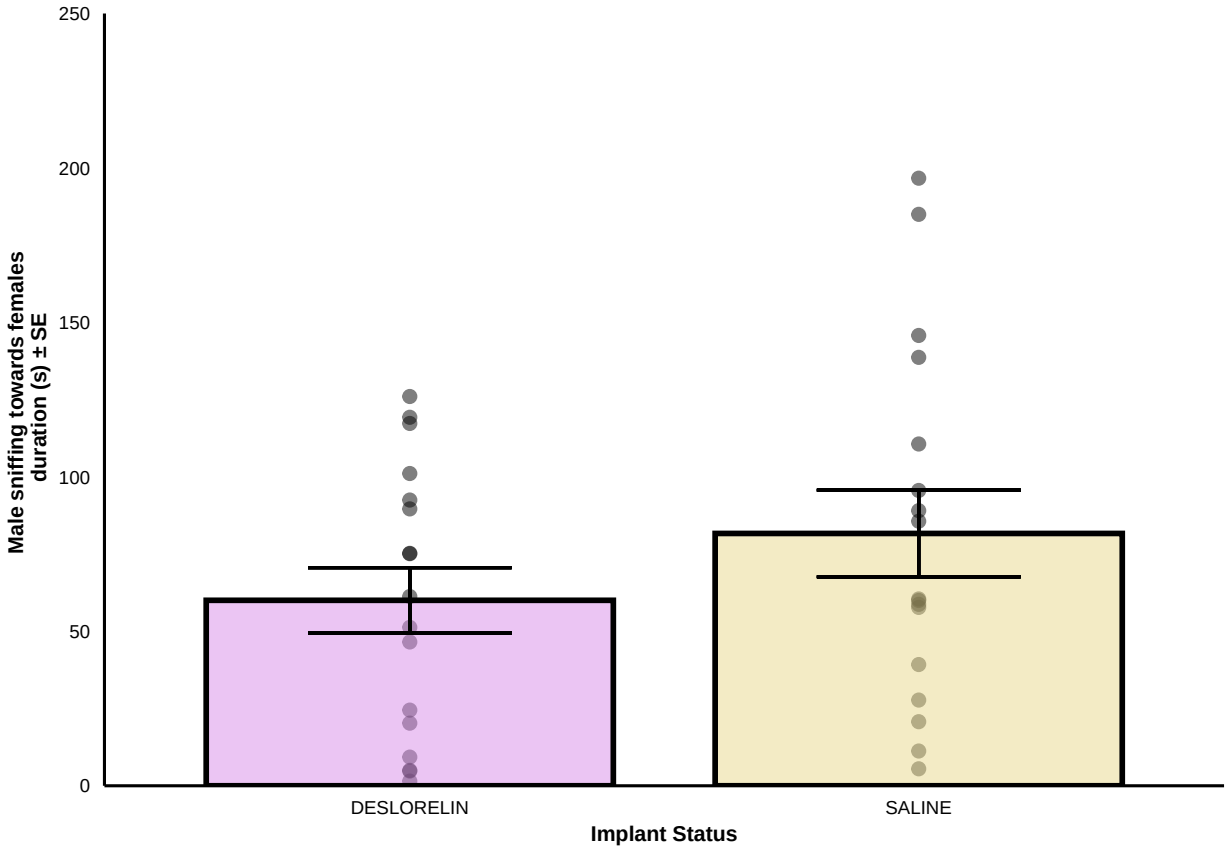
```
## No summary function supplied, defaulting to `mean_se()`
```




```
##### How much did males spend sniffing females ###

plotdata2 <- AMITdata %>% filter(ID=="Male") %>% group_by(Status) %>% mutate(meansniff = mean(Sniff.dur)

sniffplot1 <- ggplot(plotdata2, aes(x=Status, y=Sniff.dur, fill= Status)) +
  scale_y_continuous(expand= c(0,0), limits = c(0, 250)) +
  #coord_cartesian(ylim = c(0, 10)) +
  geom_jitter(aes(color = (as.factor(Status))), size = 2, position=position_dodge(width=0.9), alpha=0.5)
  geom_bar(aes(color = as.factor(Status)), alpha = .5,
           width=0.8,
           stat="summary", size = 1, position="dodge") +
  geom_errorbar(aes(ymin=meansniff-stanSnifferr, ymax=meansniff+stanSnifferr, color = as.factor(Status))
                position=position_dodge(.9)) +
  labs(x = "Implant Status", y="Male sniffing towards females \n duration (s) ± SE")+ #Axes labels
  theme_alex() +
  scale_fill_manual(values=c(COLOR1, COLOR2)) + #colors in hexadecimal
```

```
  scale_color_manual(values=c("Black", "Black")) + #colors in hexadecimal
  # annotate("segment", x = 1, xend = 4, y = 40, yend = 40, colour = "black", size=1, alpha=1) +
  #annotate("text", x = 2.5, y = 41.5, size =6, label = "**") +
  #annotate("segment", x = 1, xend = 3, y = 35, yend = 35, colour = "black", size=1, alpha=1) +
  #annotate("text", x = 2, y = 36.5, size =6, label = "*") +
  guides(fill="none", color = "none") +
  theme(legend.title=element_text(size=8, face="bold"),
        legend.text = element_text(size=8),
        axis.text = element_text(size=7, colour="black"),
        axis.title=element_text(size=8,face="bold"),
        axis.line = element_line(colour = "black"),
        panel.border = element_blank(),
        legend.position = "right"
  )
sniffplot1 #show plot
```

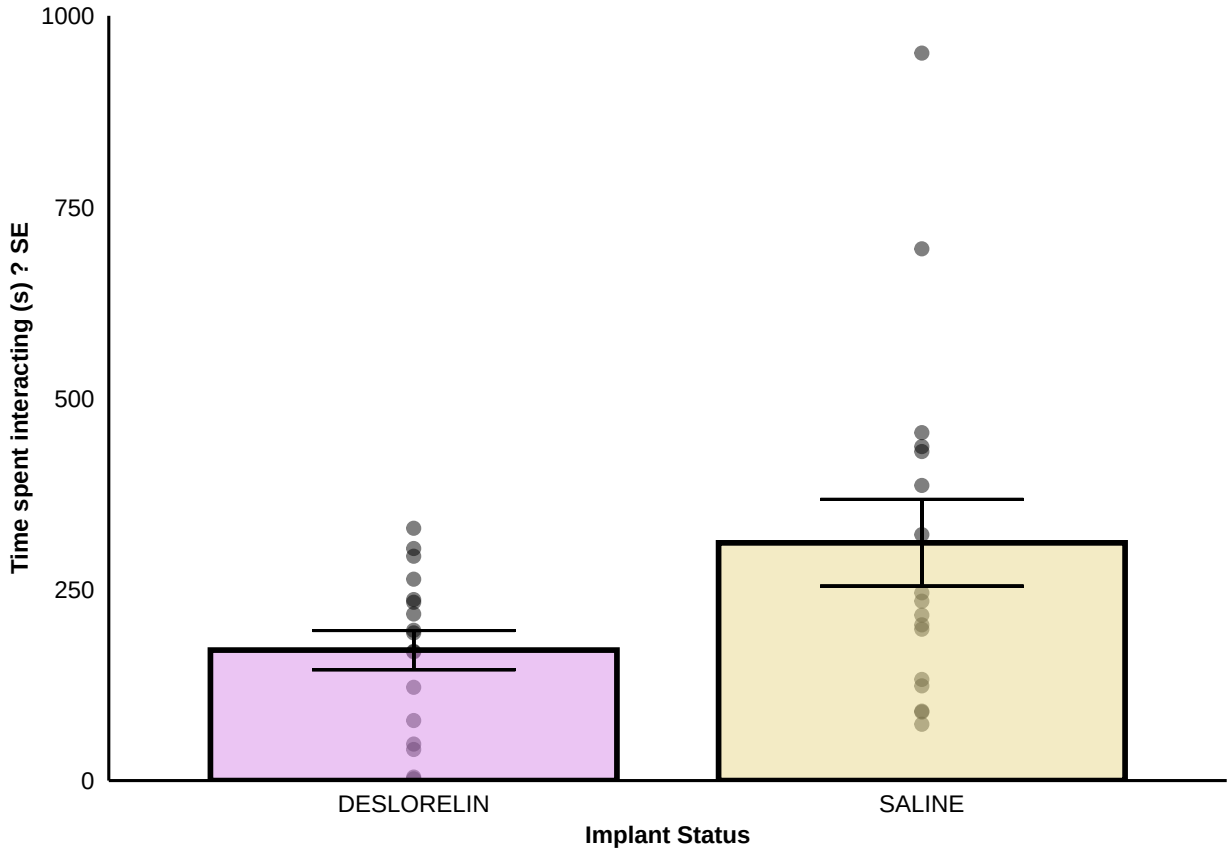
```
## No summary function supplied, defaulting to `mean_se()`
```




```
### Association time ###

plotdataINTERACT <- AMITdata %>% filter(ID=="Male") %>% group_by(Status) %>% mutate(meaninteract = mean

INTERACTplot <- ggplot(plotdataINTERACT, aes(x=Status, y=Total.time.w.male, fill= Status)) +
  scale_y_continuous(expand= c(0,0), limits = c(0, 1000)) +
  #coord_cartesian(ylim = c(0, 10)) +
  geom_jitter(aes(color = (as.factor(Status))), size = 2, position=position_dodge(width=0.9), alpha=0.5
  geom_bar(aes(color = as.factor(Status)), alpha = .5,
```

```
          width=0.8,
          stat="summary", size = 1, position="dodge") +
  geom_errorbar(aes(ymin=meaninteract-stanInteracterr, ymax=meaninteract+stanInteracterr, color = as.fa
                position=position_dodge(.9)) +
  labs(x = "Implant Status", y="Time spent interacting (s) ? SE")+ #Axes labels
  theme_alex() +
  scale_fill_manual(values=c(COLOR1, COLOR2)) + #colors in hexadecimal
  scale_color_manual(values=c("Black", "Black")) + #colors in hexadecimal
  # annotate("segment", x = 1, xend = 4, y = 40, yend = 40, colour = "black", size=1, alpha=1) +
  #annotate("text", x = 2.5, y = 41.5, size =6, label = "**") +
  #annotate("segment", x = 1, xend = 3, y = 35, yend = 35, colour = "black", size=1, alpha=1) +
  #annotate("text", x = 2, y = 36.5, size =6, label = "*") +
  guides(fill="none", color = "none") +
  theme(legend.title=element_text(size=8, face="bold"),
        legend.text = element_text(size=8),
        axis.text = element_text(size=9, colour="black"),
        axis.title=element_text(size=9,face="bold"),
        axis.line = element_line(colour = "black"),
        panel.border = element_blank(),
        legend.position = "right"
  )
INTERACTplot #show plot
```

```
## No summary function supplied, defaulting to `mean_se()`
```

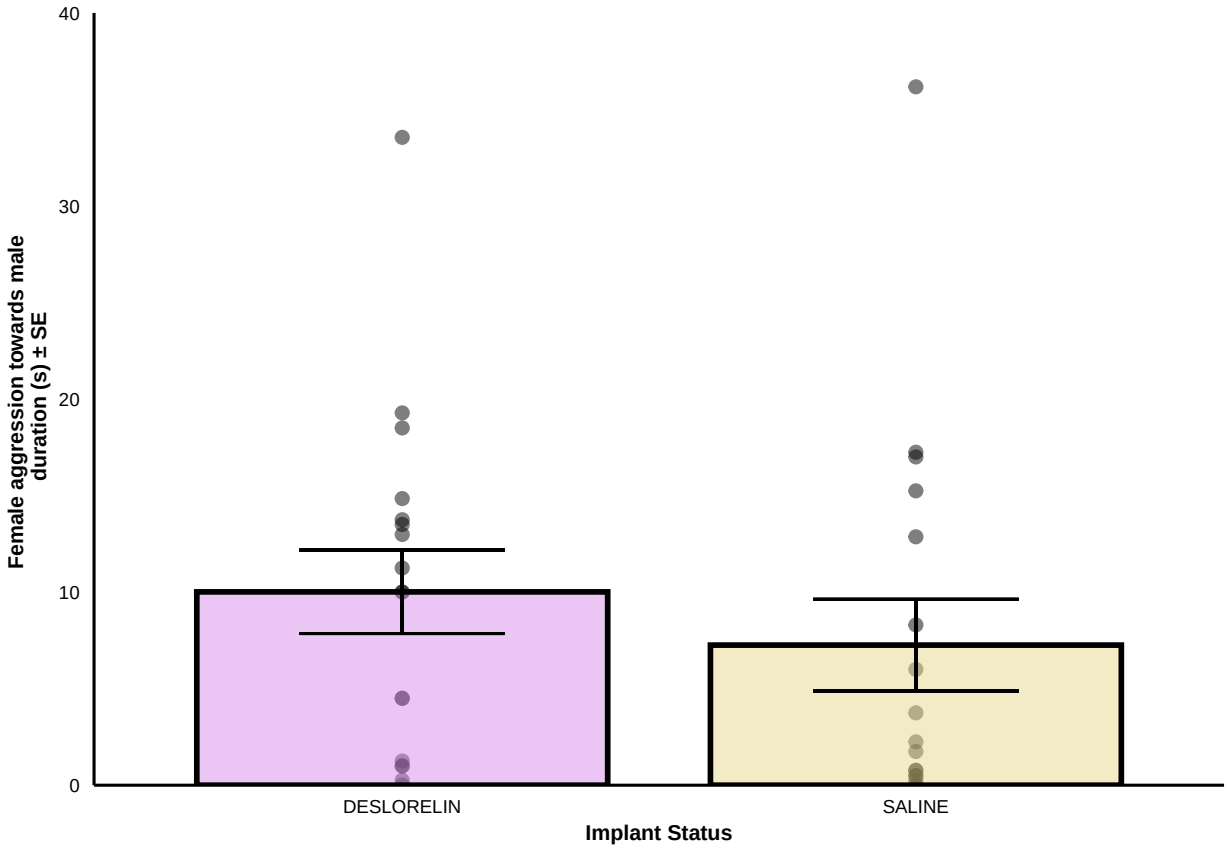



```
ggsave("Interaction Plot.png", width=4, height=4, dpi=600)
```

```
## No summary function supplied, defaulting to `mean_se()`
```

```
### Female Aggression ####
plotdataF1 <- AMITdata %>% filter(Sex=="F") %>% group_by(Status) %>% mutate(meanagg = mean(Aggression.du

aggplot2 <- ggplot(plotdataF1, aes(x=Status, y=Aggression.dur, fill= Status)) +
  scale_y_continuous(expand= c(0,0), limits = c(0, 40)) +
  #coord_cartesian(ylim = c(0, 10)) +
  geom_jitter(aes(color = (as.factor(Status))), size = 2, position=position_dodge(width=0.9), alpha=0.5)
  geom_bar(aes(color = as.factor(Status)), alpha = .5,
           width=0.8,
           stat="summary", size = 1, position="dodge") +
  geom_errorbar(aes(ymin=meanagg-stanaggerr, ymax=meanagg+stanaggerr, color = as.factor(Status)), width=
                position=position_dodge(.9)) +
  labs(x = "Implant Status", y="Female aggression towards male \n duration (s) ± SE")+ #Axes labels
  theme_alex() +
  scale_fill_manual(values=c(COLOR1, COLOR2)) + #colors in hexadecimal
  scale_color_manual(values=c("Black", "Black")) + #colors in hexadecimal
  # annotate("segment", x = 1, xend = 4, y = 40, yend = 40, colour = "black", size=1, alpha=1) +
  #annotate("text", x = 2.5, y = 41.5, size =6, label = "**") +
  #annotate("segment", x = 1, xend = 3, y = 35, yend = 35, colour = "black", size=1, alpha=1) +
  #annotate("text", x = 2, y = 36.5, size =6, label = "*") +
  guides(fill="none", color = "none") +
  theme(legend.title=element_text(size=8, face="bold"),
        legend.text = element_text(size=8),
        axis.text = element_text(size=7, colour="black"),
        axis.title=element_text(size=8,face="bold"),
        axis.line = element_line(colour = "black"),
        panel.border = element_blank(),
        legend.position = "right"
  )
aggplot2 #show plot
```

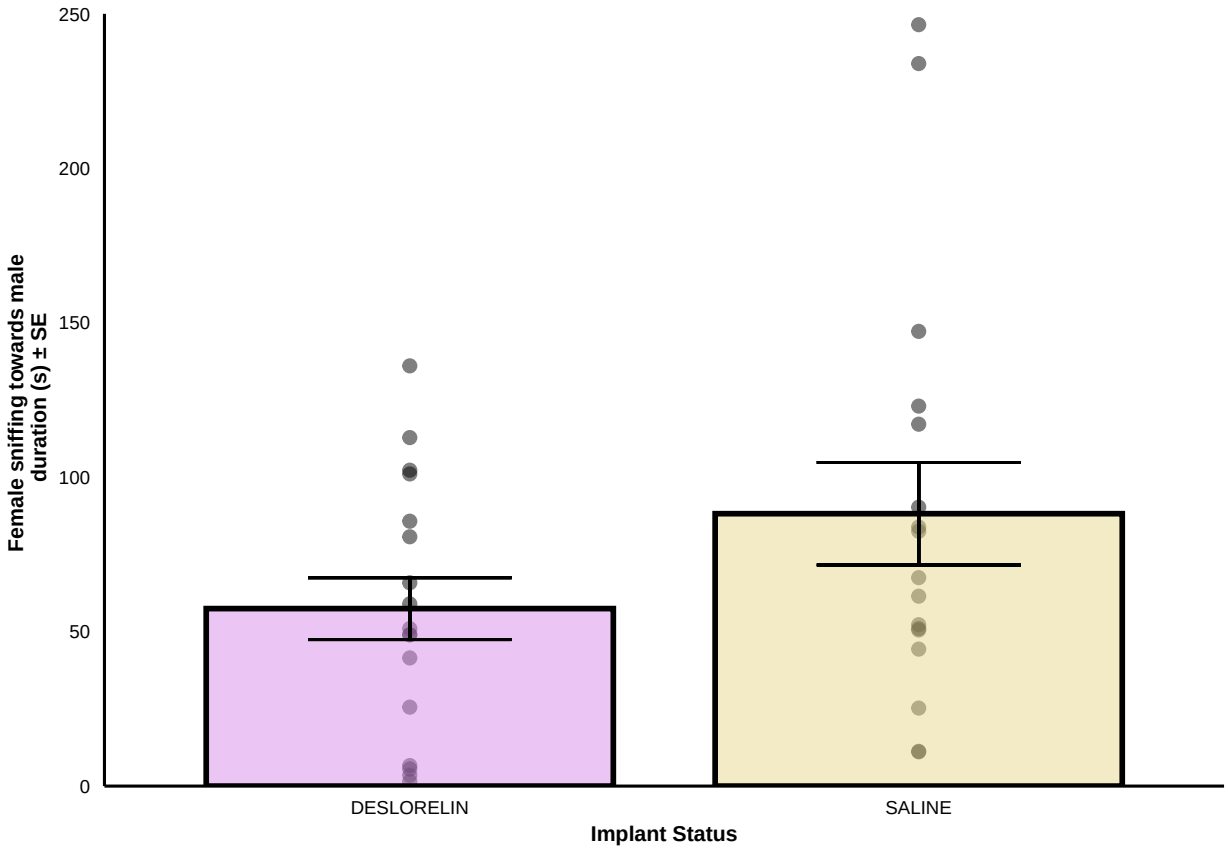
```
## No summary function supplied, defaulting to `mean_se()`
```




```
##Female Sniffing###

plotdataF2 <- AMITdata %>% filter(Sex=="F") %>% group_by(Status) %>% mutate(meansniff = mean(Sniff.dur)

sniffplotF1 <- ggplot(plotdataF2, aes(x=Status, y=Sniff.dur, fill= Status)) +
  scale_y_continuous(expand= c(0,0), limits = c(0, 250)) +
  #coord_cartesian(ylim = c(0, 10)) +
  geom_jitter(aes(color = (as.factor(Status))), size = 2, position=position_dodge(width=0.9), alpha=0.5)
  geom_bar(aes(color = as.factor(Status)), alpha = .5,
           width=0.8,
           stat="summary", size = 1, position="dodge") +
  geom_errorbar(aes(ymin=meansniff-stanSnifferr, ymax=meansniff+stanSnifferr, color = as.factor(Status))
                position=position_dodge(.9)) +
  labs(x = "Implant Status", y="Female sniffing towards male \n duration (s) ± SE")+ #Axes labels
  theme_alex() +
  scale_fill_manual(values=c(COLOR1, COLOR2)) + #colors in hexadecimal
  scale_color_manual(values=c("Black", "Black")) + #colors in hexadecimal
  # annotate("segment", x = 1, xend = 4, y = 40, yend = 40, colour = "black", size=1, alpha=1) +
  #annotate("text", x = 2.5, y = 41.5, size =6, label = "**") +
  #annotate("segment", x = 1, xend = 3, y = 35, yend = 35, colour = "black", size=1, alpha=1) +
  #annotate("text", x = 2, y = 36.5, size =6, label = "*") +
  guides(fill="none", color = "none") +
  theme(legend.title=element_text(size=8, face="bold"),
        legend.text = element_text(size=8),
        axis.text = element_text(size=7, colour="black"),
        axis.title=element_text(size=8,face="bold"),
        axis.line = element_line(colour = "black"),
```

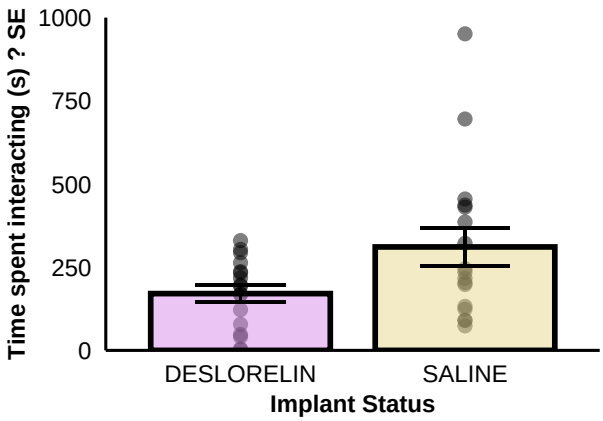
```
        panel.border = element_blank(),
        legend.position = "right"
  )
sniffplotF1 #show plot
```

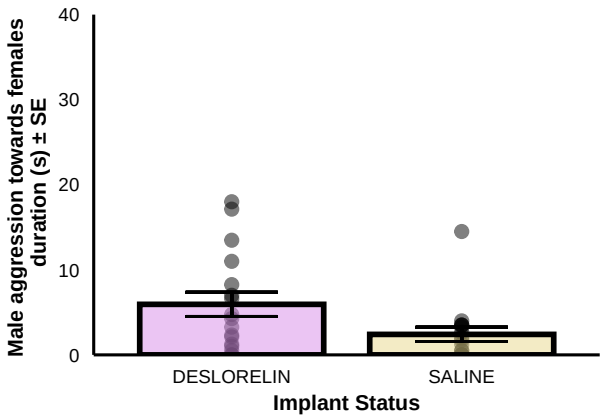
```
## No summary function supplied, defaulting to `mean_se()`
```

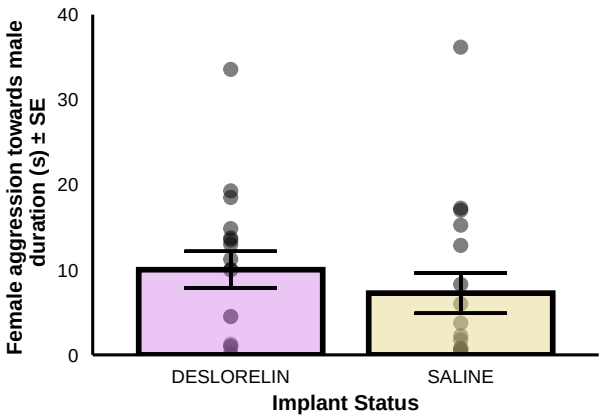



```
##
plot_grid(INTERACTplot, NULL, aggplot1, aggplot2, nrow=2, rel_widths = c(2, 2))
```

```
## No summary function supplied, defaulting to `mean_se()`
## No summary function supplied, defaulting to `mean_se()`
## No summary function supplied, defaulting to `mean_se()`
```

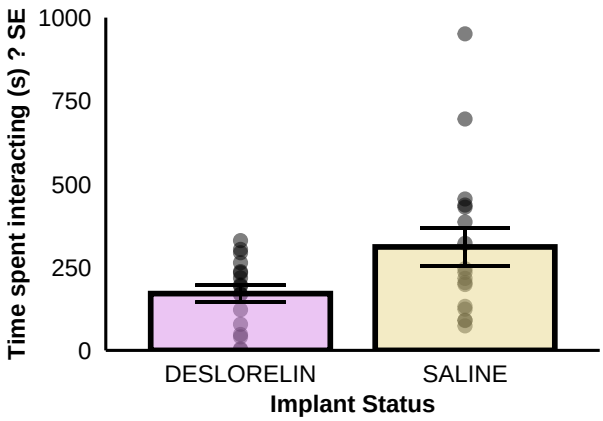


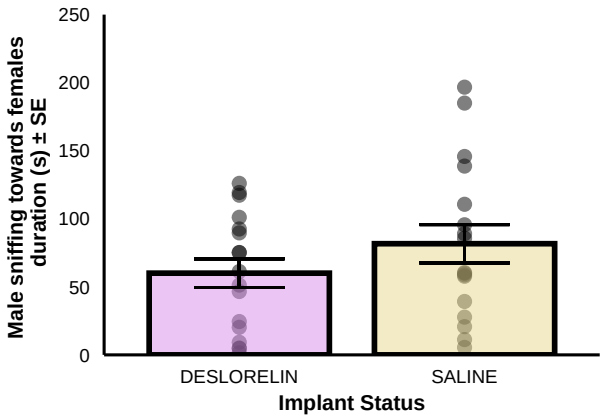


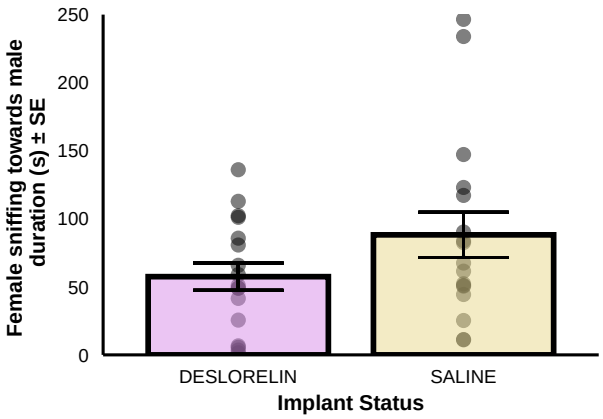



```
ggsave("Aggression Panel.png", width=8, height=3, dpi=600) #save panel locally

plot_grid(INTERACTplot, NULL, sniffplot1, sniffplotF1, nrow=2, rel_widths = c(2, 2))
```

```
## No summary function supplied, defaulting to `mean_se()`
## No summary function supplied, defaulting to `mean_se()`
## No summary function supplied, defaulting to `mean_se()`
```



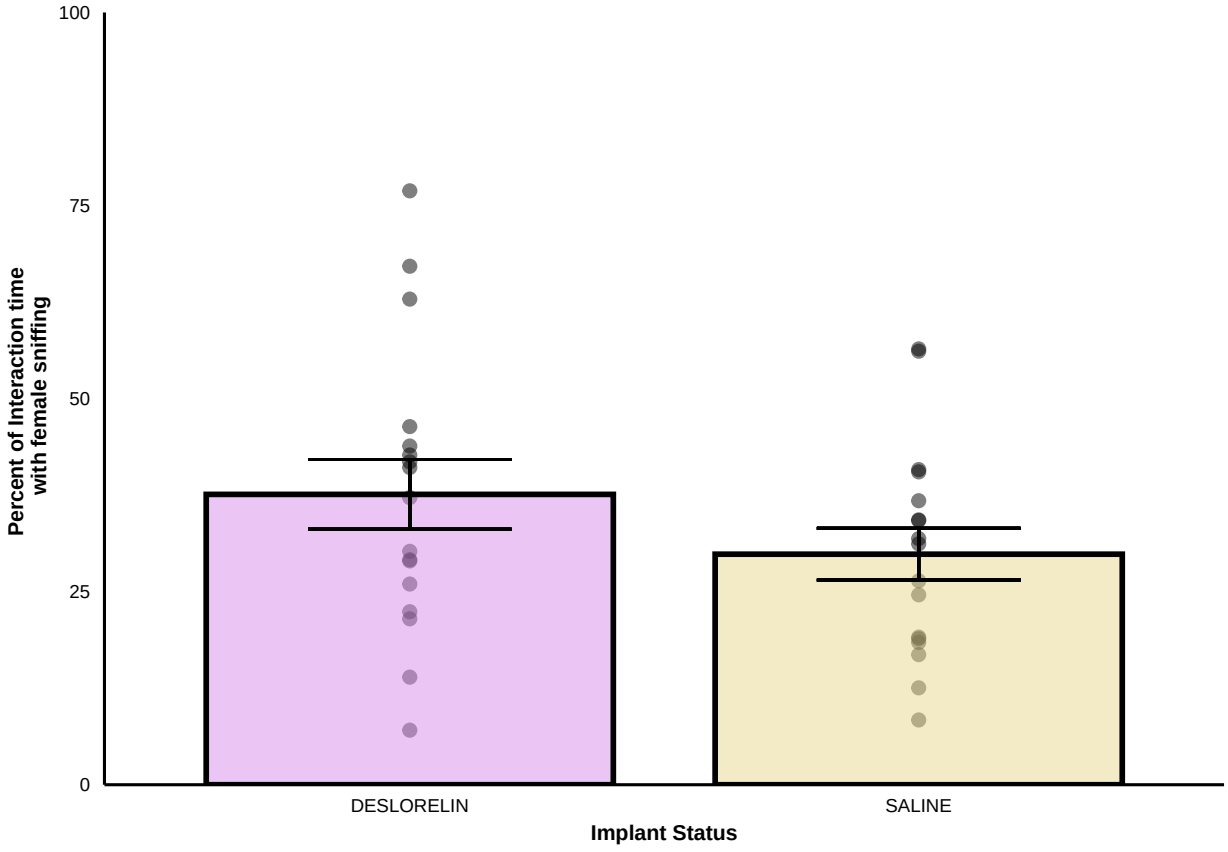





```
ggsave("Sniff Panel.png", width=8, height=3, dpi=600) #save panel locally


### Percentage plots ##

plotPositive <- AMITdata %>% filter(Sex=="F") %>% group_by(Status) %>% mutate(mean1 = mean(PercentPOS),

plotPOS <- ggplot(plotPositive, aes(x=Status, y=PercentPOS, fill= Status)) +
  scale_y_continuous(expand= c(0,0), limits = c(0, 100)) +
  #coord_cartesian(ylim = c(0, 10)) +
  geom_jitter(aes(color = (as.factor(Status))), size = 2, position=position_dodge(width=0.9), alpha=0.5)
  geom_bar(aes(color = as.factor(Status)), alpha = .5,
           width=0.8,
           stat="summary", size = 1, position="dodge") +
  geom_errorbar(aes(ymin=mean1-stanerr1, ymax=mean1+stanerr1, color = as.factor(Status)), width=.4,
                position=position_dodge(.9)) +
  labs(x = "Implant Status", y="Percent of Interaction time \n with female sniffing")+ #Axes labels
  theme_alex() +
  scale_fill_manual(values=c(COLOR1, COLOR2)) + #colors in hexadecimal
  scale_color_manual(values=c("Black", "Black")) + #colors in hexadecimal
  # annotate("segment", x = 1, xend = 4, y = 40, yend = 40, colour = "black", size=1, alpha=1) +
  #annotate("text", x = 2.5, y = 41.5, size =6, label = "**") +
  #annotate("segment", x = 1, xend = 3, y = 35, yend = 35, colour = "black", size=1, alpha=1) +
  #annotate("text", x = 2, y = 36.5, size =6, label = "*") +
  guides(fill="none", color = "none") +
  theme(legend.title=element_text(size=8, face="bold"),
        legend.text = element_text(size=8),
```

```
        axis.text = element_text(size=7, colour="black"),
        axis.title=element_text(size=8,face="bold"),
        axis.line = element_line(colour = "black"),
        panel.border = element_blank(),
        legend.position = "right"
  )
plotPOS #show plot
```

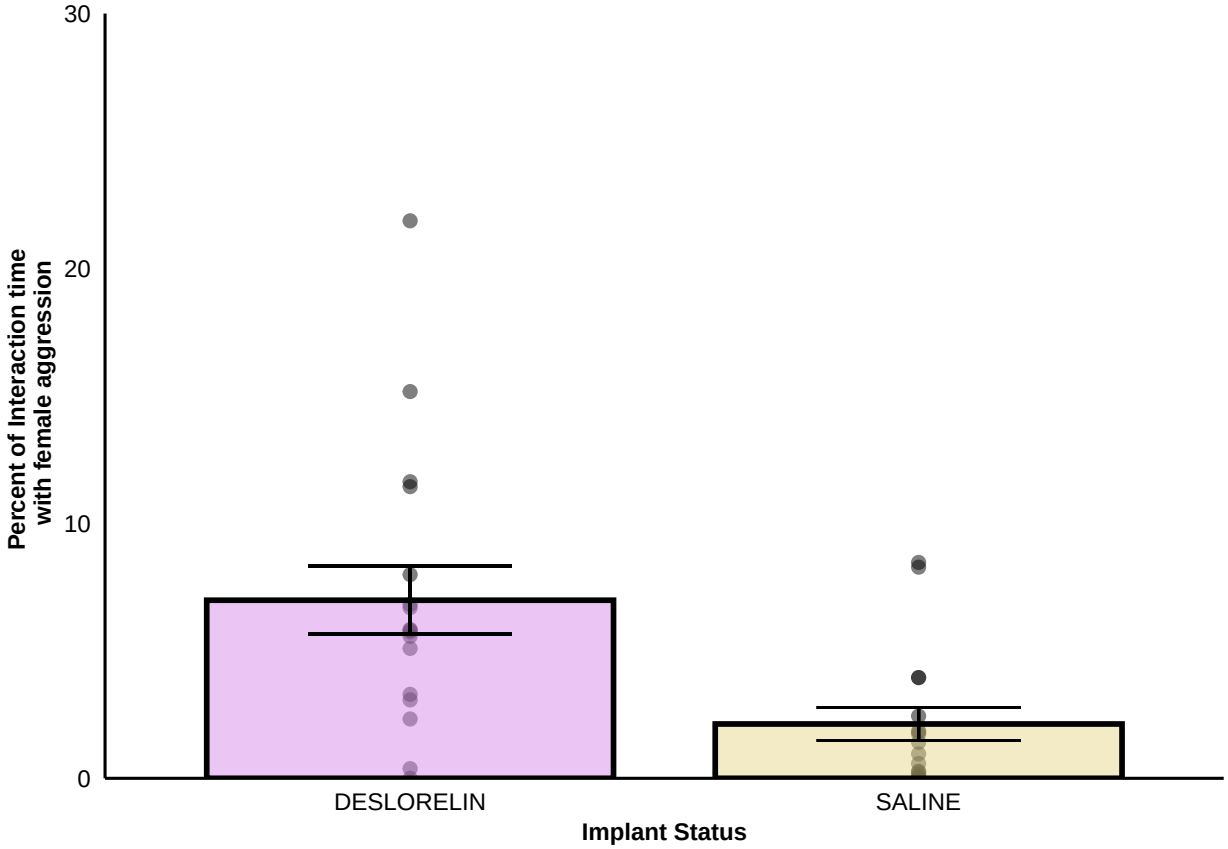
```
## No summary function supplied, defaulting to `mean_se()`
```




```
plotAggressive <- AMITdata %>% filter(Sex=="F") %>% group_by(Status) %>% mutate(mean1 = mean(PercentAGG)

plotAGG <- ggplot(plotAggressive, aes(x=Status, y=PercentAGG, fill= Status)) +
  scale_y_continuous(expand= c(0,0), limits = c(0, 30)) +
  #coord_cartesian(ylim = c(0, 10)) +
  geom_jitter(aes(color = (as.factor(Status))), size = 2, position=position_dodge(width=0.9), alpha=0.5)
  geom_bar(aes(color = as.factor(Status)), alpha = .5,
           width=0.8,
           stat="summary", size = 1, position="dodge") +
  geom_errorbar(aes(ymin=mean1-stanerr1, ymax=mean1+stanerr1, color = as.factor(Status)), width=.4,
                position=position_dodge(.9)) +
  labs(x = "Implant Status", y="Percent of Interaction time \n with female aggression")+ #Axes labels
  theme_alex() +
  scale_fill_manual(values=c(COLOR1, COLOR2)) + #colors in hexadecimal
  scale_color_manual(values=c("Black", "Black")) + #colors in hexadecimal
  # annotate("segment", x = 1, xend = 4, y = 40, yend = 40, colour = "black", size=1, alpha=1) +
  #annotate("text", x = 2.5, y = 41.5, size =6, label = "**") +
```

```
  #annotate("segment", x = 1, xend = 3, y = 35, yend = 35, colour = "black", size=1, alpha=1) +
  #annotate("text", x = 2, y = 36.5, size =6, label = "*") +
  guides(fill="none", color = "none") +
  theme(legend.title=element_text(size=8, face="bold"),
        legend.text = element_text(size=8),
        axis.text = element_text(size=9, colour="black"),
        axis.title=element_text(size=9,face="bold"),
        axis.line = element_line(colour = "black"),
        panel.border = element_blank(),
        legend.position = "right"
  )
plotAGG #show plot
```

```
## No summary function supplied, defaulting to `mean_se()`
```




```
ggsave("Aggression Plot2.png", width=4, height=4, dpi=600) #save panel locally
```

```
## No summary function supplied, defaulting to `mean_se()`
```

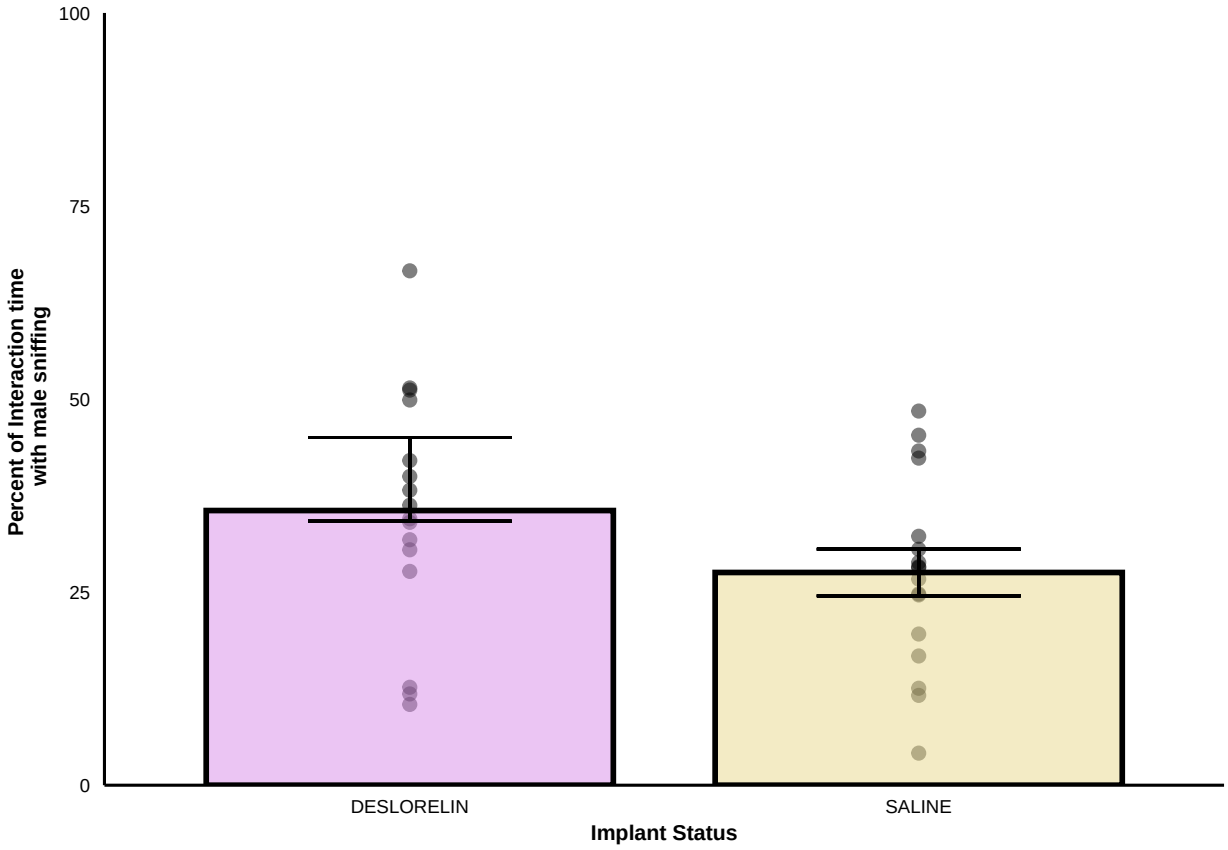
```
### Percentage plots male ##


plotPositiveM <- AMITdata %>% filter(Sex=="M") %>% group_by(Status) %>% mutate(mean1 = mean(PercentPOS)

plotPOSM <- ggplot(plotPositiveM, aes(x=Status, y=PercentPOS, fill= Status)) +
  scale_y_continuous(expand= c(0,0), limits = c(0, 100)) +
  #coord_cartesian(ylim = c(0, 10)) +
  geom_jitter(aes(color = (as.factor(Status))), size = 2, position=position_dodge(width=0.9), alpha=0.5
```

```
  geom_bar(aes(color = as.factor(Status)), alpha = .5,
           width=0.8,
           stat="summary", size = 1, position="dodge") +
  geom_errorbar(aes(ymin=mean1-stanerr1, ymax=mean1+stanerr1, color = as.factor(Status)), width=.4,
                position=position_dodge(.9)) +
  labs(x = "Implant Status", y="Percent of Interaction time \n with male sniffing")+ #Axes labels
  theme_alex() +
  scale_fill_manual(values=c(COLOR1, COLOR2)) + #colors in hexadecimal
  scale_color_manual(values=c("Black", "Black")) + #colors in hexadecimal
  # annotate("segment", x = 1, xend = 4, y = 40, yend = 40, colour = "black", size=1, alpha=1) +
  #annotate("text", x = 2.5, y = 41.5, size =6, label = "**") +
  #annotate("segment", x = 1, xend = 3, y = 35, yend = 35, colour = "black", size=1, alpha=1) +
  #annotate("text", x = 2, y = 36.5, size =6, label = "*") +
  guides(fill="none", color = "none") +
  theme(legend.title=element_text(size=8, face="bold"),
        legend.text = element_text(size=8),
        axis.text = element_text(size=7, colour="black"),
        axis.title=element_text(size=8,face="bold"),
        axis.line = element_line(colour = "black"),
        panel.border = element_blank(),
        legend.position = "right"
  )
plotPOSM #show plot
```

```
## Warning: Removed 1 rows containing non-finite values (stat_summary).
```

```
## No summary function supplied, defaulting to `mean_se()`
```

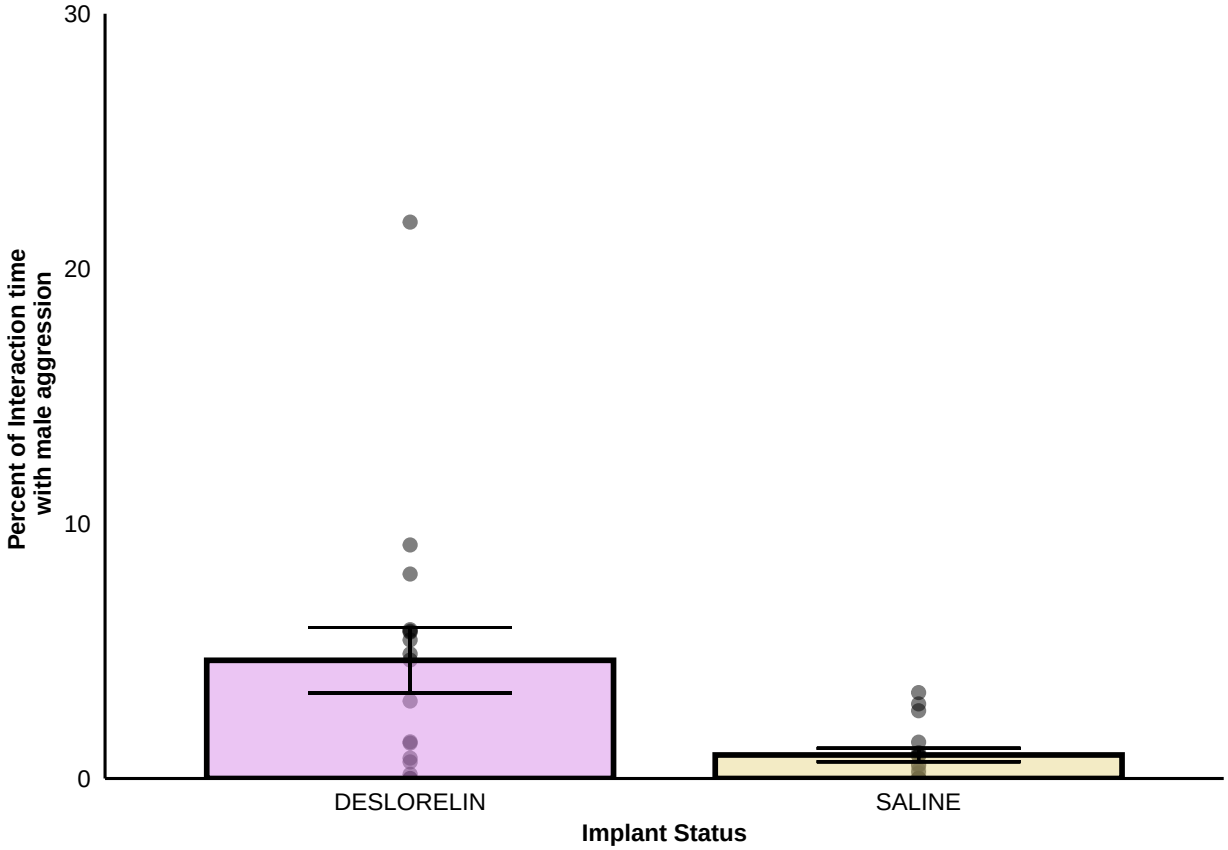
```
## Warning: Removed 1 rows containing missing values (geom_point).
```




```
plotAggressiveM <- AMITdata %>% filter(Sex=="M") %>% group_by(Status) %>% mutate(mean1 = mean(PercentAGG

plotAGGM <- ggplot(plotAggressiveM, aes(x=Status, y=PercentAGG, fill= Status)) +
  scale_y_continuous(expand= c(0,0), limits = c(0, 30)) +
  #coord_cartesian(ylim = c(0, 10)) +
  geom_jitter(aes(color = (as.factor(Status))), size = 2, position=position_dodge(width=0.9), alpha=0.5)
  geom_bar(aes(color = as.factor(Status)), alpha = .5,
           width=0.8,
           stat="summary", size = 1, position="dodge") +
  geom_errorbar(aes(ymin=mean1-stanerr1, ymax=mean1+stanerr1, color = as.factor(Status)), width=.4,
                position=position_dodge(.9)) +
  labs(x = "Implant Status", y="Percent of Interaction time \n with male aggression")+ #Axes labels
  theme_alex() +
  scale_fill_manual(values=c(COLOR1, COLOR2)) + #colors in hexadecimal
  scale_color_manual(values=c("Black", "Black")) + #colors in hexadecimal
  # annotate("segment", x = 1, xend = 4, y = 40, yend = 40, colour = "black", size=1, alpha=1) +
  #annotate("text", x = 2.5, y = 41.5, size =6, label = "**") +
  #annotate("segment", x = 1, xend = 3, y = 35, yend = 35, colour = "black", size=1, alpha=1) +
  #annotate("text", x = 2, y = 36.5, size =6, label = "*") +
  guides(fill="none", color = "none") +
  theme(legend.title=element_text(size=8, face="bold"),
        legend.text = element_text(size=8),
        axis.text = element_text(size=9, colour="black"),
        axis.title=element_text(size=9,face="bold"),
        axis.line = element_line(colour = "black"),
        panel.border = element_blank(),
        legend.position = "right"
```

```
  )
plotAGGM #show plot
```

```
## No summary function supplied, defaulting to `mean_se()`
```

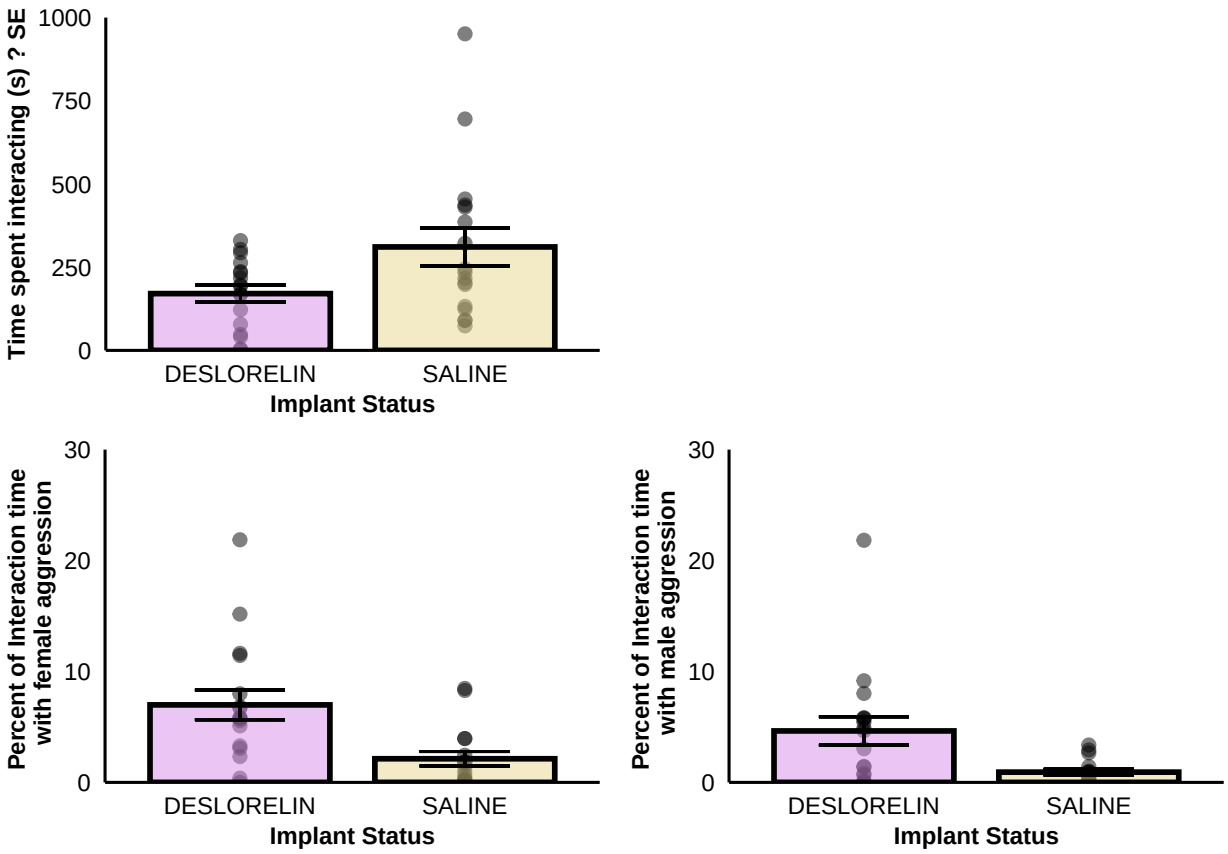



```
ggsave("Aggression Panel percent2.png", width=4, height=4, dpi=600)
```

```
## No summary function supplied, defaulting to `mean_se()`
```

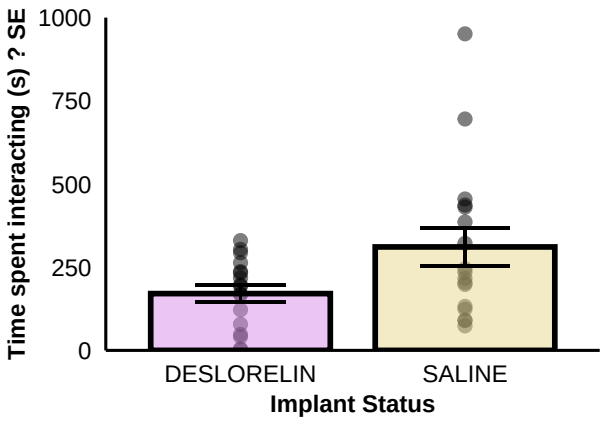
```
plot_grid(INTERACTplot, NULL, plotAGG, plotAGGM, nrow=2, rel_widths = c(2, 2))
```

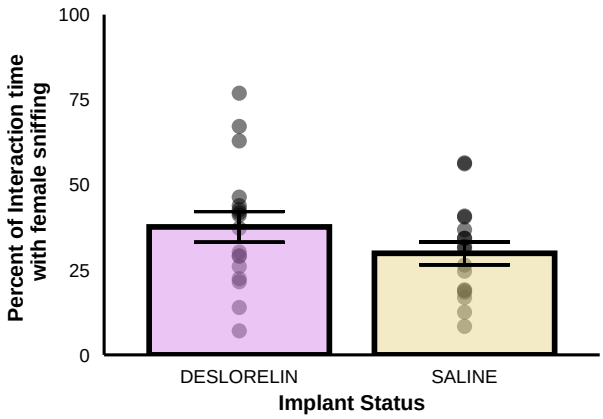
```
## No summary function supplied, defaulting to `mean_se()`
## No summary function supplied, defaulting to `mean_se()`
## No summary function supplied, defaulting to `mean_se()`
```

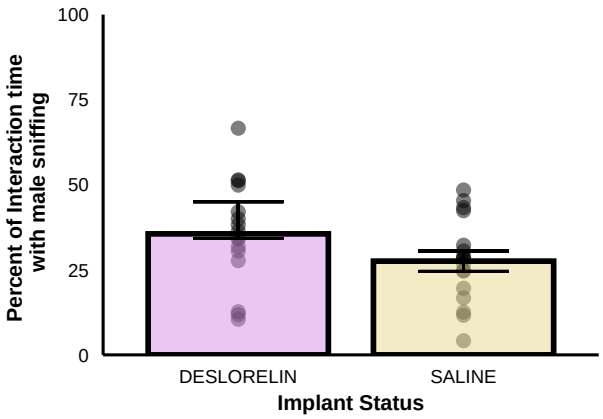



```
ggsave("Aggression Panel percent.png", width=8, height=3, dpi=600) #save panel locally

plot_grid(INTERACTplot, NULL, plotPOS, plotPOSM, nrow=2, rel_widths = c(2, 2))
```

```
## No summary function supplied, defaulting to `mean_se()`
## No summary function supplied, defaulting to `mean_se()`
## Warning: Removed 1 rows containing non-finite values (stat_summary).
## No summary function supplied, defaulting to `mean_se()`
## Warning: Removed 1 rows containing missing values (geom_point).
```








```
ggsave("Sniff Panel percent.png", width=8, height=3, dpi=600) #save panel locally


### Statistics
#1. Examine whether treatment affected interaction.
Males <- AMITdata %>% filter(Sex=="M") #prevent double counting datapoints.

#Because each male was only in one trial, lmer and lm are equivalent.
fit1 <- lmer(Total.time.w.male ~ Status + (1|Trial), data=Males)
```

```
## boundary (singular) fit: see ?isSingular
```

```
anova(fit1)
```

```
## Type III Analysis of Variance Table with Satterthwaite's method
##        Sum Sq Mean Sq NumDF DenDF F value  Pr(>F)
## Status 167156  167156     1    32  5.0683 0.03137 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
lm(Total.time.w.male ~ Status, data=Males)
```

```
##
## Call:
## lm(formula = Total.time.w.male ~ Status, data = Males)
##
## Coefficients:
##  (Intercept)  StatusSALINE
##        170.6         140.2
```

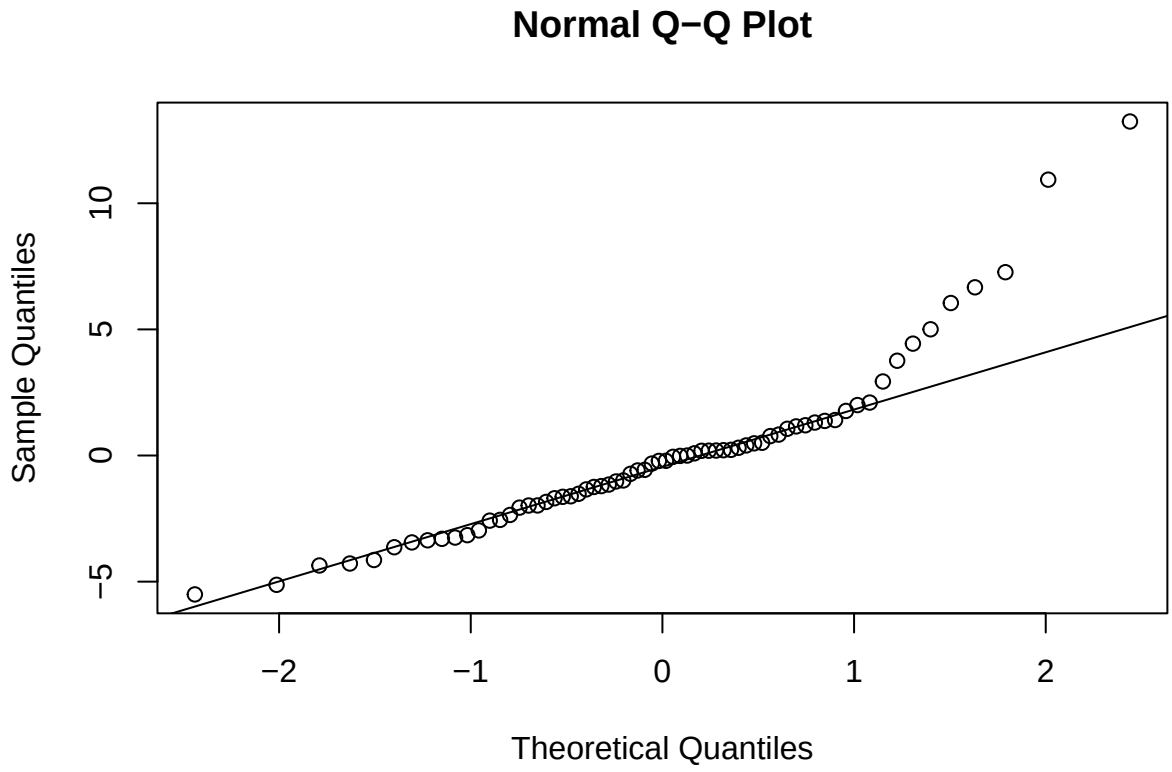
```r
anova(lm(Total.time.w.male ~ Status, data=Males))
```

```
## Analysis of Variance Table
##
## Response: Total.time.w.male
##           Df  Sum Sq Mean Sq F value  Pr(>F)
## Status     1  167156  167156  5.0683 0.03137 *
## Residuals 32 1055375   32980
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```r
#2. Does status predict aggression time?
fit2 <- lmer(PercentAGG ~ Status * Sex + (1|Trial), data=AMITdata)
anova(fit2)
```

```
## Type III Analysis of Variance Table with Satterthwaite's method
##             Sum Sq Mean Sq NumDF DenDF F value    Pr(>F)
## Status     312.077 312.077     1    48 23.0820 1.564e-05 ***
## Sex         53.790  53.790     1    48  3.9784   0.05178 .
## Status:Sex   5.527   5.527     1    48  0.4088   0.52561
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```r
fit2.emm <- emmeans(fit2,  ~  Status*Sex)
qqnorm(resid(fit2))
qqline(resid(fit2))
```




```r
#3. Does status predict sniffing time?
fit3 <- lmer(PercentPOS ~ Status * Sex + (1|Trial), data=AMITdata)
anova(fit3)
```

```
## Type III Analysis of Variance Table with Satterthwaite's method
##             Sum Sq Mean Sq NumDF DenDF F value   Pr(>F)
## Status     1667.23 1667.23     1    48  9.2288 0.003847 **
## Sex           0.38    0.38     1    48  0.0021 0.963730
## Status:Sex   79.17   79.17     1    48  0.4382 0.511143
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
fit3.emm <- emmeans(fit3,  ~  Status*Sex)
qqnorm(resid(fit3))
qqline(resid(fit3))
```