

# Oxytocin Study

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Mean Scores:

```
print.data.frame(means)
```

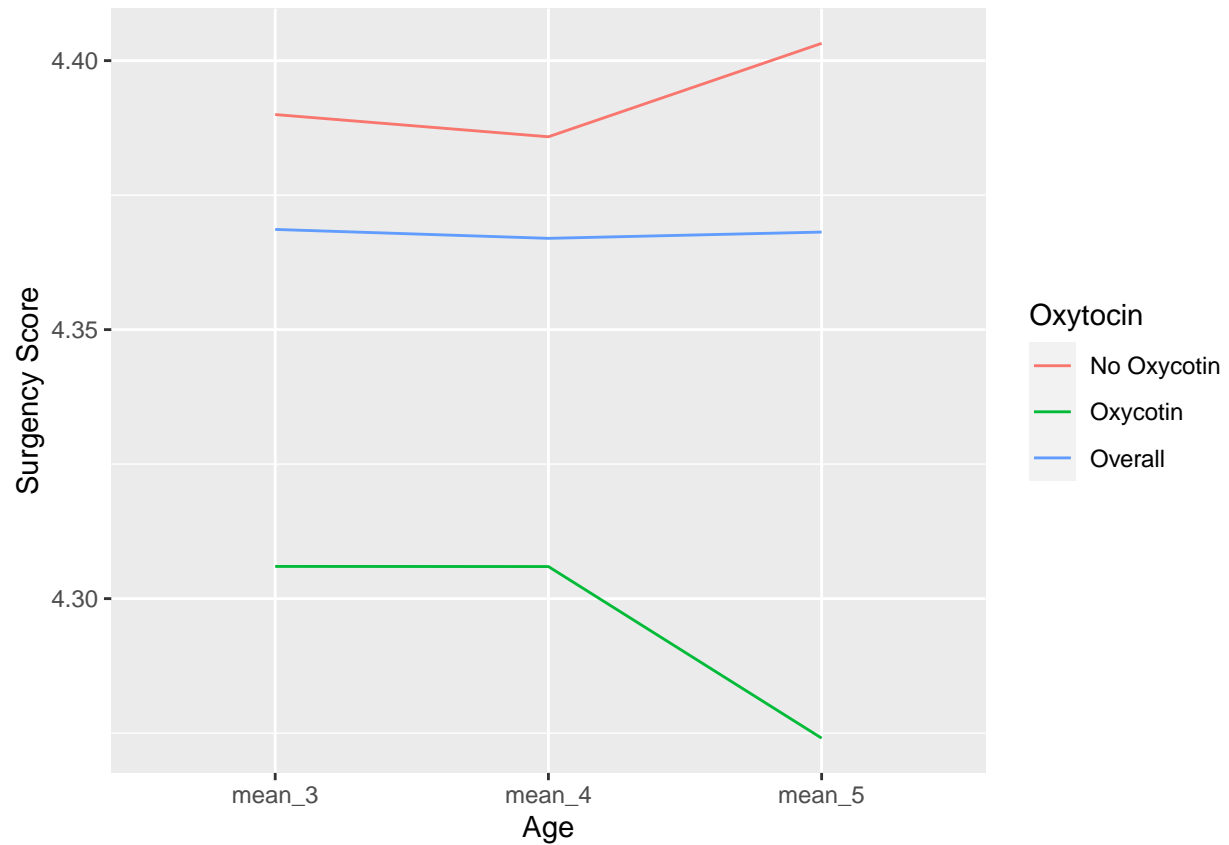
```
##   oxytocin    N mean_surgency_3 mean_surgency_4 mean_surgency_5 mean_NEGAFF_3
## 1         0 880         4.389977         4.385849         4.403213         3.709830
## 2         1 254         4.305989         4.305962         4.274066         3.649678
##   mean_NEGAFF_4 mean_NEGAFF_5 mean_EFFCON_3 mean_EFFCON_4 mean_EFFCON_5
## 1         3.950563         3.926590         5.323528         5.385425         5.460139
## 2         3.813782         4.031429         5.233911         5.389654         5.249956
```

```
print.data.frame(missing)
```

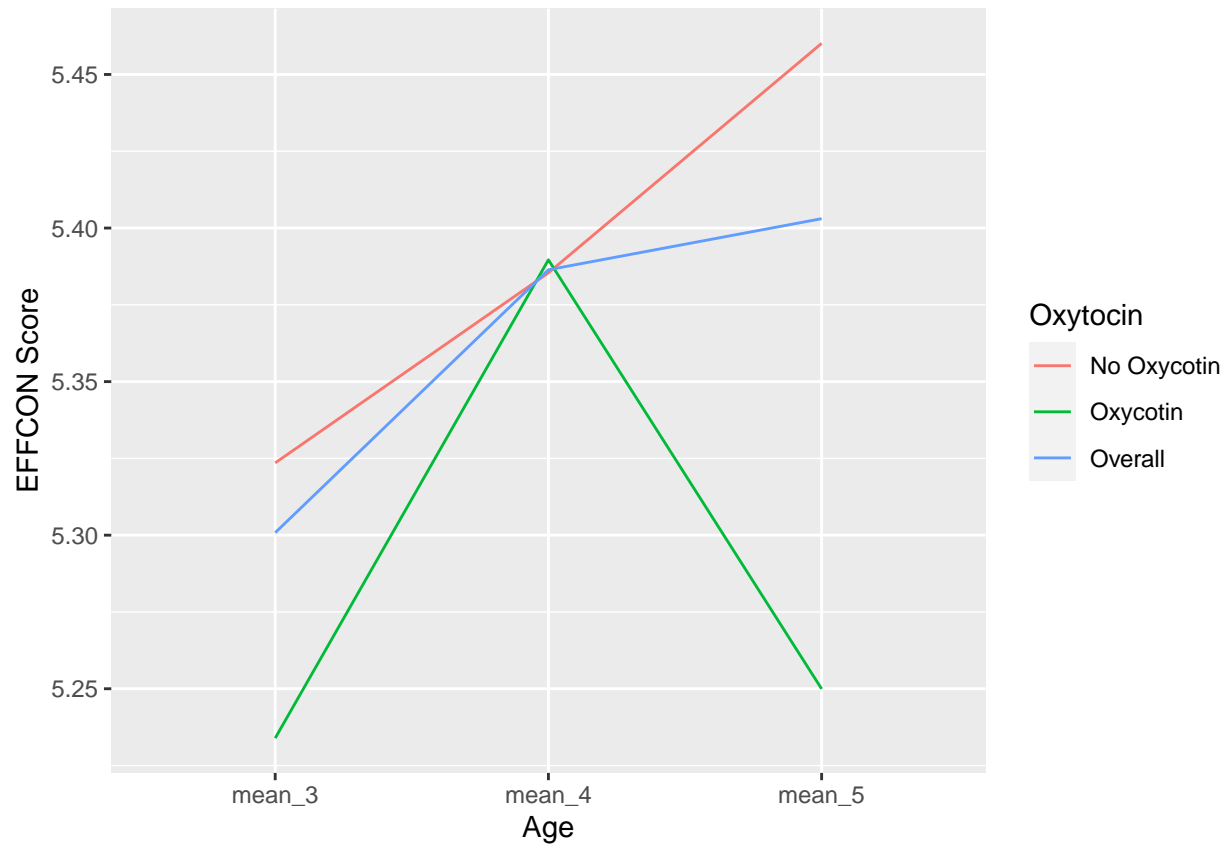
```
##   oxytocin    N missing_surgency_3 missing_surgency_4 missing_surgency_5
## 1         0 880                 616                 628                 636
## 2         1 254                 164                 176                 163
##   missing_NEGAFF_3 missing_NEGAFF_4 missing_NEGAFF_5 missing_EFFCON_3
## 1                 615                 628                 636                 615
## 2                 164                 176                 163                 164
##   missing_EFFCON_4 missing_EFFCON_5
## 1                 628                 636
## 2                 176                 163
```

Plots:

```
sur_means %>%
  gather(age, mean_score, mean_3:mean_5) %>%
  rbind(c(3, 'mean_3', mean(oxy_means$`3y_CBQ_SURGENCY_score`, na.rm = T)), c(3, 'mean_4', mean(oxy_means$`4y_CBQ_SURGENCY_score`, na.rm = T)), c(3, 'mean_5', mean(oxy_means$`5y_CBQ_SURGENCY_score`, na.rm = T)))
  mutate(oxytocin_during_childbirth = as.factor(oxytocin_during_childbirth), mean_score = as.numeric(mean_score))
  ggplot() +
  geom_line(aes(x=age, y=mean_score, group=oxytocin_during_childbirth, col = oxytocin_during_childbirth))
  scale_color_discrete(name = "Oxytocin", labels = c("No Oxytocin", "Oxytocin", "Overall")) +
  xlab("Age") + ylab("Surgency Score")
```



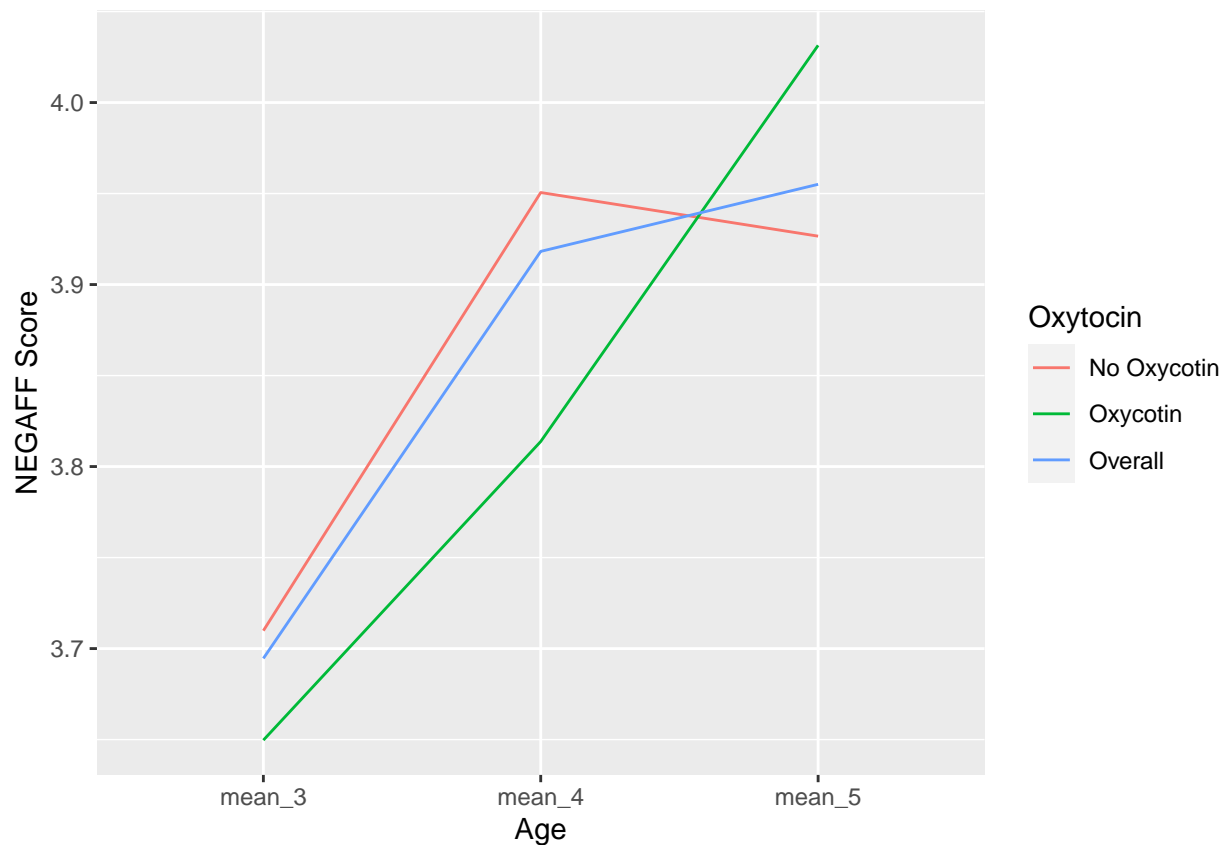
```
EFFCON_means %>%
  gather(age, mean_score, mean_3:mean_5) %>%
  rbind(c(3, 'mean_3', mean(oxy_means$'3y_CBQ_EFFCON_score', na.rm = T)), c(3, 'mean_4', mean(oxy_means$'3y_CBQ_EFFCON_score', na.rm = T)), c(3, 'mean_5', mean(oxy_means$'3y_CBQ_EFFCON_score', na.rm = T)))
  mutate(oxytocin_during_childbirth = as.factor(oxytocin_during_childbirth), mean_score = as.numeric(mean_score))
  ggplot() +
  geom_line(aes(x=age, y=mean_score, group=oxytocin_during_childbirth, col = oxytocin_during_childbirth)) +
  scale_color_discrete(name = "Oxytocin", labels = c("No Oxytocin", "Oxytocin", "Overall")) +
  xlab("Age") + ylab("EFFCON Score")
```



```

NEGAFF_means %>%
  gather(age, mean_score, mean_3:mean_5) %>%
  rbind(c(3, 'mean_3', mean(oxy_means$'3y_CBQ_NEGAFF_score', na.rm = T)), c(3, 'mean_4', mean(oxy_means$'3y_CBQ_NEGAFF_score', na.rm = T)), c(3, 'mean_5', mean(oxy_means$'3y_CBQ_NEGAFF_score', na.rm = T)))
  mutate(oxytocin_during_childbirth = as.factor(oxytocin_during_childbirth), mean_score = as.numeric(mean_score))
  ggplot() +
  geom_line(aes(x=age, y=mean_score, group=oxytocin_during_childbirth, col = oxytocin_during_childbirth)) +
  scale_color_discrete(name = "Oxytocin", labels = c("No Oxytocin", "Oxytocin", "Overall")) +
  xlab("Age") + ylab("NEGAFF Score")

```



Surgency Model:  $E[Y] = 4.36 - 0.0089\text{oxytocin} + 0.0169\text{sex} + 0.0067\text{age} - 0.022 \text{oxytocin}*\text{age}$

```
#surgency dataset
sur_data <- oxy_means %>% select("ID", "oxytocin_during_childbirth", "3y_CBQ_SURGECY_score", "4y_CBQ_SURGECY_score")
gather(sur_data, age, surgency, `3y_CBQ_SURGECY_score`:`4y_CBQ_SURGECY_score`, factor_key=TRUE)

#age assignment
sur_data$age <- ifelse(sur_data$age == "3y_CBQ_SURGECY_score", 3, ifelse(sur_data$age == "4y_CBQ_SURGECY_score", 4, NA))

#model
sur_model <- lm(surgency~oxytocin_during_childbirth+infant_sex_A+age+oxytocin_during_childbirth*age, data=sur_data)
summary(sur_model)
```

```
##
## Call:
## lm(formula = surgency ~ oxytocin_during_childbirth + infant_sex_A +
##     age + oxytocin_during_childbirth * age, data = sur_data)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -3.4036 -0.5605  0.0134  0.5617  2.3531
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    4.35989    0.160719  27.128  <2e-16 ***
## oxytocin_during_childbirth -0.008933    0.307904  -0.029    0.977
```

```

## infant_sex_A          0.016860   0.054807   0.308   0.758
## age                   0.006694   0.038758   0.173   0.863
## oxytocin_during_childbirth:age -0.022640   0.075443  -0.300   0.764
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.8708 on 1010 degrees of freedom
## (2387 observations deleted due to missingness)
## Multiple R-squared:  0.002623, Adjusted R-squared:  -0.001327
## F-statistic: 0.664 on 4 and 1010 DF, p-value: 0.6171

```