

STATS 101B Project

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```
memory_data <- read.csv("STATS 101B Subjects - Final Data.csv")
memory_aov <- aov(Memory ~ Methamphetamine * Dark.Chocolate, data = memory_data)
memory_lm <- lm(Memory ~ Methamphetamine * Dark.Chocolate, data = memory_data)

summary(memory_lm)

##
## Call:
## lm(formula = Memory ~ Methamphetamine * Dark.Chocolate, data = memory_data)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -24.691  -8.966  -1.439   6.654  37.511
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      48.191      1.840  26.195 < 2e-16 ***
## Methamphetamine50mg  4.464      2.602   1.716 0.087931 .
## Dark.Chocolate99%    16.298      2.602   6.264 2.79e-09 ***
## Methamphetamine50mg:Dark.Chocolate99% -13.638      3.679  -3.707 0.000281 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 12.34 on 176 degrees of freedom
## Multiple R-squared:  0.1924, Adjusted R-squared:  0.1786
## F-statistic: 13.97 on 3 and 176 DF,  p-value: 3.258e-08

summary(memory_aov)

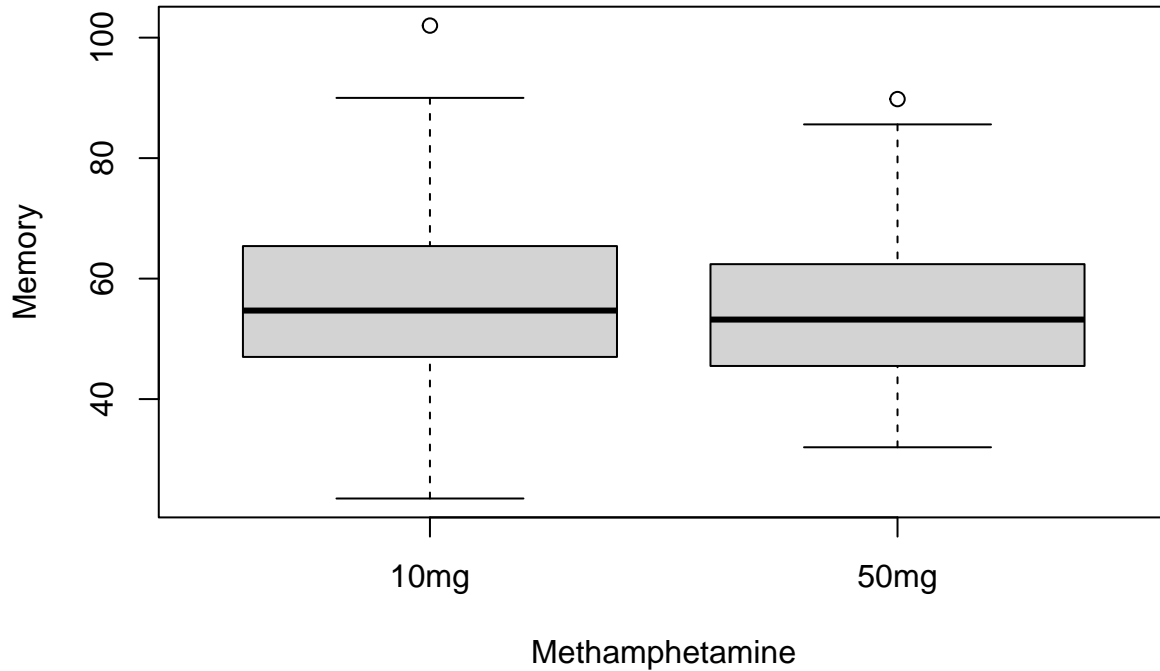
##              Df Sum Sq Mean Sq F value    Pr(>F)
## Methamphetamine      1      249      249    1.638 0.202302
## Dark.Chocolate      1     4043     4043   26.547 6.85e-07 ***
## Methamphetamine:Dark.Chocolate 1     2092     2092   13.738 0.000281 ***
## Residuals          176    26805      152
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

anova(memory_lm)

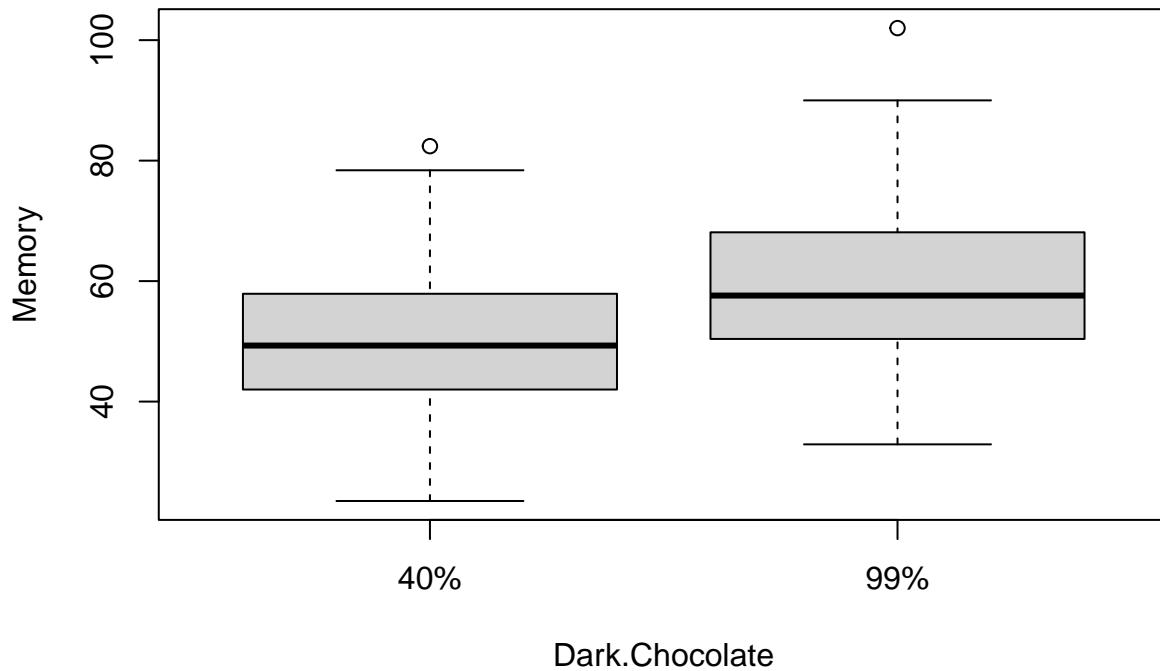
## Analysis of Variance Table
##
## Response: Memory
##              Df Sum Sq Mean Sq F value    Pr(>F)
## Methamphetamine      1    249.5     249.5    1.6379 0.2023023
```

```
## Dark.Chocolate          1  4043.2  4043.2 26.5471 6.851e-07 ***
## Methamphetamine:Dark.Chocolate  1  2092.4  2092.4 13.7382 0.0002813 ***
## Residuals                176 26805.4   152.3
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
boxplot(Memory ~ Methamphetamine, data = memory_data)
```



```
boxplot(Memory ~ Dark.Chocolate, data = memory_data)
```



```
TukeyHSD(memory_aov)
```

```
## Tukey multiple comparisons of means
## 95% family-wise confidence level
##
## Fit: aov(formula = Memory ~ Methamphetamine * Dark.Chocolate, data = memory_data)
##
## $Methamphetamine
##           diff          lwr          upr          p adj
## 50mg-10mg -2.354444 -5.985169 1.27628 0.2023023
##
## $Dark.Chocolate
##           diff          lwr          upr p adj
## 99%-40% 9.478889 5.848164 13.10961 7e-07
##
## $`Methamphetamine:Dark.Chocolate`
##           diff          lwr          upr          p adj
## 50mg:40%-10mg:40% 4.464444 -2.2838023 11.212691 0.3184780
## 10mg:99%-10mg:40% 16.297778 9.5495310 23.046025 0.0000000
## 50mg:99%-10mg:40% 7.124444 0.3761977 13.872691 0.0340965
## 10mg:99%-50mg:40% 11.833333 5.0850866 18.581580 0.0000590
## 50mg:99%-50mg:40% 2.660000 -4.0882468 9.408247 0.7365626
## 50mg:99%-10mg:99% -9.173333 -15.9215801 -2.425087 0.0029991
```