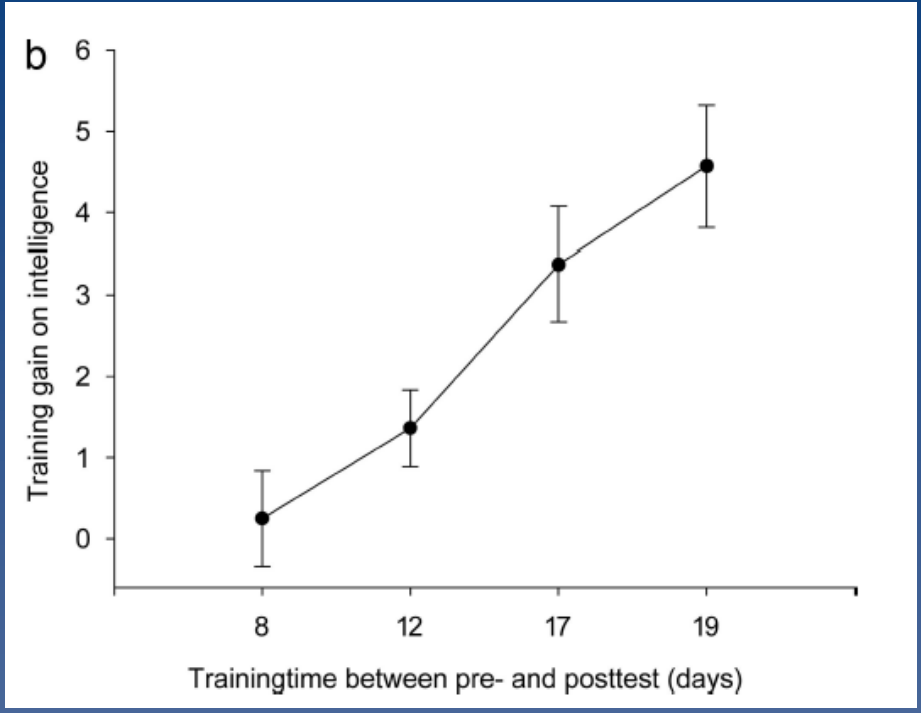
# Lecture 15
# Segment 3
## ANOVA in R

# Results

- Second approach
  - IV: WM training (number of sessions)
  - DV: Gain on intelligence test (post - pre)

# Jaeggi et al. (2008)



# R code for ANOVA

```
# ANOVA
aov.model = aov(wm.t$gain ~ wm.t$cond)
summary(aov.model)
aov.table = summary(aov.model)

# Effect size for ANOVA
ss = aov.table[[1]]$"Sum Sq"
eta.sq = ss[1] / (ss[1] + ss[2])
eta.sq

# Post-hoc tests
TukeyHSD(aov.model)

# Levene's test
library(car)
leveneTest(wm.t$gain, wm.t$cond, center="mean")
```

# R output for ANOVA

```
> # ANOVA
> aov.model = aov(wm.t$gain ~ wm.t$cond)
> summary(aov.model)
            Df Sum Sq Mean Sq F value   Pr(>F)
wm.t$cond    3  213.0   71.01   35.29 2.16e-14 ***
Residuals   76  152.9    2.01
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
> aov.table = summary(aov.model)
>
> # Effect size for ANOVA
> ss = aov.table[[1]]$"Sum Sq"
> eta.sq = ss[1] / (ss[1] + ss[2])
> eta.sq
[1] 0.5820896
```

# R output for ANOVA

```
> # Post-hoc tests
> TukeyHSD(aov.model)
  Tukey multiple comparisons of means
    95% family-wise confidence level

Fit: aov(formula = wm.t$gain ~ wm.t$cond)

$`wm.t$cond`
         diff        lwr      upr     p adj
t12-t08 1.25 0.07159545 2.428405 0.0333212
t17-t08 3.05 1.87159545 4.228405 0.0000000
t19-t08 4.25 3.07159545 5.428405 0.0000000
t17-t12 1.80 0.62159545 2.978405 0.0007908
t19-t12 3.00 1.82159545 4.178405 0.0000000
t19-t17 1.20 0.02159545 2.378405 0.0443394
```

# R output for ANOVA

```
> leveneTest(wm.t$gain, wm.t$cond, center="mean")
Levene's Test for Homogeneity of Variance (center = "mean")
      Df F value Pr(>F)
group  3  1.1269 0.3436
      76
>
```

# Jaeggi et al. (2008)