Power analysis

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07/07/2018

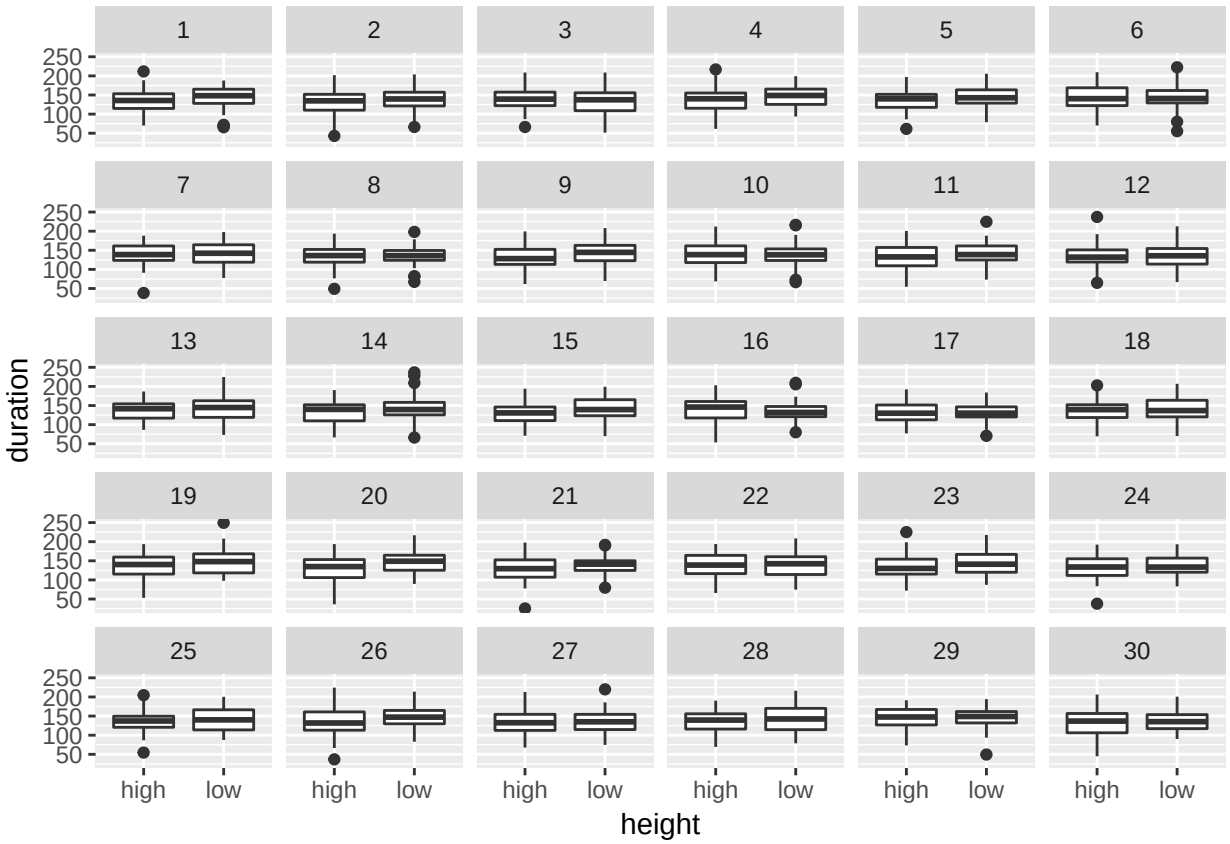
```
set.seed(8788)

durations <- NULL

for (i in 1:30) {
  durations <- c(durations, rnorm(50, 135, 30), rnorm(50, 135, 30) + 5)
}

sim_data <- tibble(
  duration = durations,
  height = rep(rep(c("high", "low"), each = 50), 30),
  subject = rep(1:30, each = 100)
) %>%
  mutate(
    height = factor(height),
    subject = factor(subject)
  )
```

```
sim_data %>%
  ggplot(aes(height, duration)) +
  geom_boxplot() +
  facet_wrap(~ subject)
```




```
voicing_sim_lm <- lmer(
  duration ~
    height +
    (1|subject),
  data = sim_data
)
summary(voicing_sim_lm)
```

```
## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: duration ~ height + (1 | subject)
##    Data: sim_data
##
## REML criterion at convergence: 28967.4
##
## Scaled residuals:
##     Min      1Q  Median      3Q     Max
## -3.6419 -0.6707  0.0142  0.6494  3.6020
##
## Random effects:
##  Groups   Name        Variance Std.Dev.
##  subject  (Intercept)   0.0     0.00
##  Residual             915.5    30.26
## Number of obs: 3000, groups:  subject, 30
```

```
##
## Fixed effects:
##              Estimate Std. Error        df t value Pr(>|t|)
## (Intercept)  135.5879     0.7813 2998.0000 173.552  < 2e-16 ***
## heightlow      4.8043     1.1049 2998.0000   4.348 1.42e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
##           (Intr)
## heightlow -0.707
```

```
plot(sim)
```