Power Analysis

Ying

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Brief description

We examine reaction times (RT) of a simple visual discrimination task that will be used as part of a larger study on duration thresholds. In this task, participants saw a Gabor patch that varied in 8 different contrasts (2.1, 3.6467, 6.3326, 10.9968, 19.0964, 33.1615, 57.5860, 100%). Each trial starts with a shrinking circle fixation. Then the stimulus is presented until the participants makes a key press. Participants have to discriminate the orientation of the stimulus (either tilted left or right). The size and the orientation of the gabor patch are held constant across trials and participants.

The goal of this power analysis is to determine how many subjects will be required in order to reach 90% power in a paired t-test.

Pilot data

Number of subjects = 2

Number of trials per subject = 1600: 2 (orientation) x 8 (contrasts) design with 100 trials/condition

Variable descriptions:

angle = -30 (left tilt) or 30 (right tilt)

RT = reaction time in seconds

response = participant's response, 1 = left tilt, 2 = right tilt

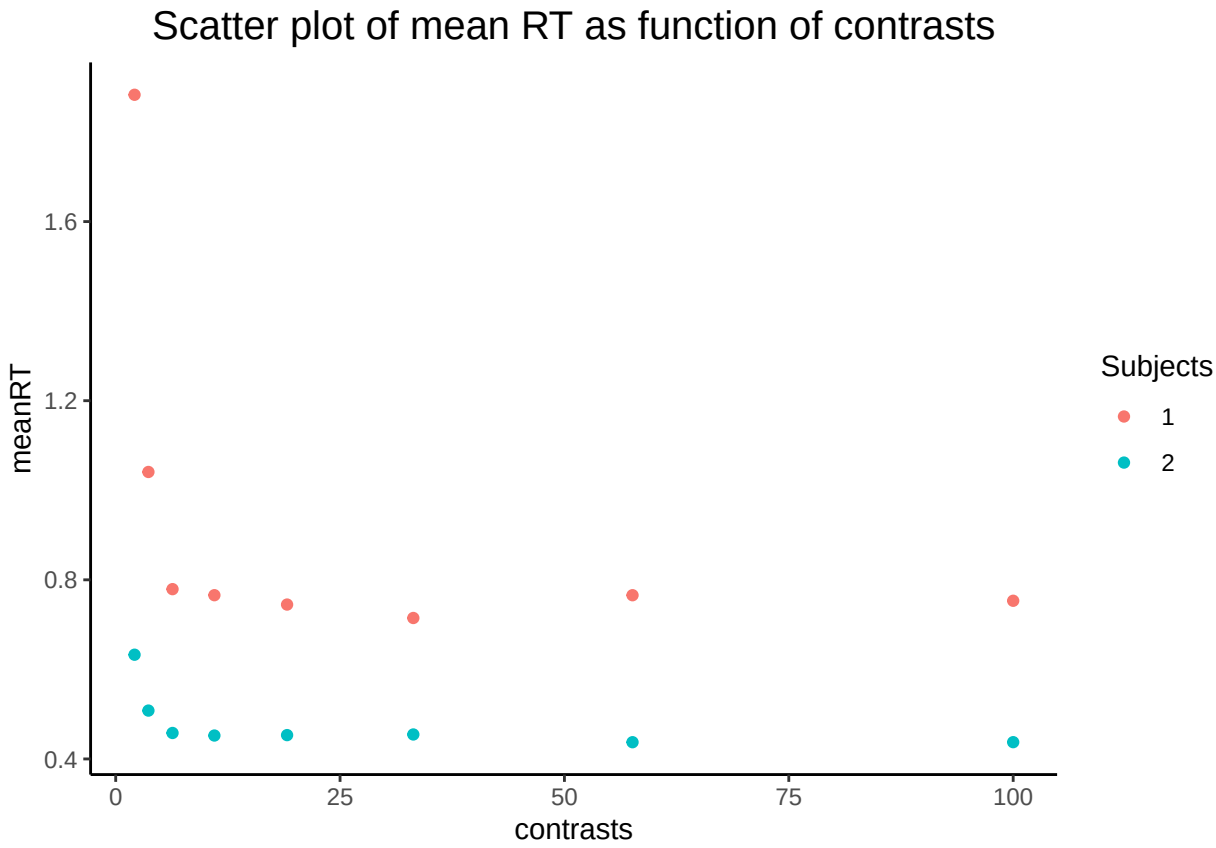
angle code = recode angles -30 and 30 into 1 and 2

accuracy = whether the participant is correct, 1 = correct, 0 = incorrect

Scatter Plot

```
d.summary = d %>%
  group_by(subjectID, contrasts) %>%
  summarise(meanRT = mean(RT))

ggplot(d.summary, aes(x = contrasts, y = meanRT, color = as.factor(subjectID))) +
  geom_point() +
  theme_classic() + labs(title = "Scatter plot of mean RT as function of contrasts") +
  theme(plot.title = element_text(hjust=0.5, size = 15)) +
  labs(color = "Subjects")
```


Scatter plot of mean RT as function of contrasts
meanRT
1.6
1.2
0.8
0.4
0
25
50
75
100
contrasts
Subjects
1
2