

Design a stroop effect test

SongTang

9/16/2017

Background Information

In a Stroop task, participants are presented with a list of words, with each word displayed in a color of ink. The participant's task is to say out loud the color of the ink in which the word is printed. The task has two conditions: a congruent words condition, and an incongruent words condition.

- In the congruent words condition, the words being displayed are color words whose names match the colors in which they are printed: for example RED, BLUE.
- In the incongruent words condition, the words displayed are color words whose names do not match the colors in which they are printed: for example PURPLE, ORANGE.

In each case, we measure the time it takes to name the ink colors in equally-sized lists. Each participant will go through and record a time from each condition.

1. What is our independent variable? What is our dependent variable?

Answer:

The independent variable is the congruency condition and incongruency condition - whether the name of the color matches with the ink color or not. The dependent variable is the time it takes to name the ink colors in equally-sized lists.

2. What is an appropriate set of hypotheses for this task? What kind of statistical test do you expect to perform? Justify your choices.

Answer:

The hypothesis that can use is: the difference between the time used to identify the colors under congruent words condition and incongruent words condition, namely, the Stroop Effect is in existence.

To be more specifically, here I will refer to the population means of congruence words group and incongruence words group - average times for the respective groups to recognize the colors.

3. Report some descriptive statistics regarding this dataset. Include at least one measure of central tendency and at least one measure of variability.

```
# Read in the data
library(readr)
dat <- read_csv("stroopdata.csv")
# Tidy up the data for later analysis
library(tidyr); suppressMessages(library(dplyr))
# Add a column identifying subjects
dat.subject <- mutate(dat, subject = 1:nrow(dat))
# Tidy up data by keeping one variable in one column
tidy.dat <- gather(dat.subject, congruency, time, -subject)
# Calculate the average time for both groups
tidy.dat %>%
  group_by(congruency) %>%
  summarise(round(mean(time), 2), round(median(time), 2), round(sd(time), 2), round(var(time), 2))

## # A tibble: 2 x 5
##   congruency `round(mean(time), 2)` `round(median(time), 2)`
##   <chr>          <dbl>          <dbl>
```

## 1	Congruent	14.05	14.36
## 2	Incongruent	22.02	21.02
## #	... with 2 more variables: `round(sd(time), 2)` <dbl>, `round(var(time),`		
## #	2)` <dbl>		