

# TOT Prime Flash Analysis

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```
options(width=60)
library(ggplot2)
library(ggthemes)
```

## Reading and Formatting Data

```
TOT = read.csv("CompiledPrimeFlash.csv", header = TRUE, sep = ",")
```

## Accuracy per Prime Condition

```
library(dplyr)

##
## Attaching package: 'dplyr'
## The following objects are masked from 'package:stats':
##
##   filter, lag
## The following objects are masked from 'package:base':
##
##   intersect, setdiff, setequal, union

overall_acc = group_by(TOT) %>%
  summarise_at(vars(TargetAccuracy), mean)

prime_acc = group_by(TOT, PrimeCondition) %>%
  summarise_at(vars(TargetAccuracy), mean)

prime_subject_acc = group_by(TOT, Subject, PrimeCondition) %>%
  summarise_at(vars(TargetAccuracy), mean)
```

## ANOVA

```
prime_subject_acc$PrimeCondition = as.factor(prime_subject_acc$PrimeCondition)
prime_subject_acc$Subject = as.factor(prime_subject_acc$Subject)

target_aov= aov(data = prime_subject_acc, TargetAccuracy ~ PrimeCondition +
                Error(Subject/PrimeCondition))
summary(target_aov)

##
## Error: Subject
```

```

##           Df Sum Sq Mean Sq F value Pr(>F)
## Residuals 17  1.263  0.0743
##
## Error: Subject:PrimeCondition
##           Df Sum Sq Mean Sq F value Pr(>F)
## PrimeCondition  3 0.1068 0.03559   2.636 0.0596 .
## Residuals      51 0.6887 0.01350
## ---
## Signif. codes:
## 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

options(contrasts = c('contr.sum', 'contr.poly'))
library(lsmeans)

## Loading required package: estimability
library(multcomp)

## Loading required package: mvtnorm
## Loading required package: survival
## Loading required package: TH.data
## Loading required package: MASS

##
## Attaching package: 'MASS'

## The following object is masked from 'package:dplyr':
##
##   select

##
## Attaching package: 'TH.data'

## The following object is masked from 'package:MASS':
##
##   geyser

imm_lsm = lsmeans::lsmeans(target_aov, c("PrimeCondition"))

## Warning in lsm.basis.aovlist(object, trms, xlev, grid, ...): Some predictors are correlated with the
## May help to re-fit with different contrasts, e.g. 'contr.sum'

prime_effect = cld(imm_lsm, alpha = 0.05,
  adjust = "tukey", details = TRUE)
library(knitr)
kable(subset(prime_effect$comparisons, prime_effect$comparisons$p.value < 0.5 ))

```

	contrast	estimate	SE	df	t.ratio	p.value
4	P - R	0.0987654	0.0387367	51	2.549662	0.0641804
5	P - U	0.0833333	0.0387367	51	2.151278	0.1509974
6	P - B	0.0802469	0.0387367	51	2.071601	0.1762273

## State Analysis

```
library(dplyr)
overall_state = dplyr::group_by(TOT, State) %>%
  summarize(count = n())

prime_state = group_by(TOT, PrimeCondition, State) %>%
  summarize(count = n())

prime_subject_state = group_by(TOT, Subject, PrimeCondition, State) %>%
  summarize(count = n())
```

## State ANOVA

```
prime_subject_state$PrimeCondition = as.factor(prime_subject_state$PrimeCondition)
prime_subject_state$Subject = as.factor(prime_subject_state$Subject)
prime_subject_state$State = as.factor(prime_subject_state$State)

state_aov = aov(data = prime_subject_state, count ~ PrimeCondition*State +
  Error(Subject/(PrimeCondition*State)))
```

```
## Warning in aov(data = prime_subject_state, count ~
## PrimeCondition * State + : Error() model is singular
```

```
summary(state_aov)
```

```
##
## Error: Subject
##              Df Sum Sq Mean Sq    F value Pr(>F)
## PrimeCondition    3   21.07     7.02 6.651e+27 <2e-16 ***
## State              3  150.40    50.13 4.747e+28 <2e-16 ***
## PrimeCondition:State 3    0.00     0.00 1.928e+00  0.204
## Residuals         8    0.00     0.00
## ---
## Signif. codes:
## 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Error: Subject:PrimeCondition
##              Df Sum Sq Mean Sq    F value Pr(>F)
## PrimeCondition    3   4.63   1.544 9.133e+26 <2e-16 ***
## State              3  82.14  27.381 1.620e+28 <2e-16 ***
## PrimeCondition:State 7    0.00   0.000 3.740e-01  0.912
## Residuals        41    0.00   0.000
## ---
## Signif. codes:
## 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Error: Subject:State
##              Df Sum Sq Mean Sq F value    Pr(>F)
## State          3  569.1  189.71  11.280 1.58e-05 ***
## PrimeCondition:State 8  349.2   43.65   2.596  0.0215 *
## Residuals       41  689.5   16.82
## ---
```

```
## Signif. codes:
## 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Error: Subject:PrimeCondition:State
##               Df Sum Sq Mean Sq F value Pr(>F)
## PrimeCondition:State    9   36.1    4.011    0.797    0.619
## Residuals              129  649.0    5.031
```

## Figures

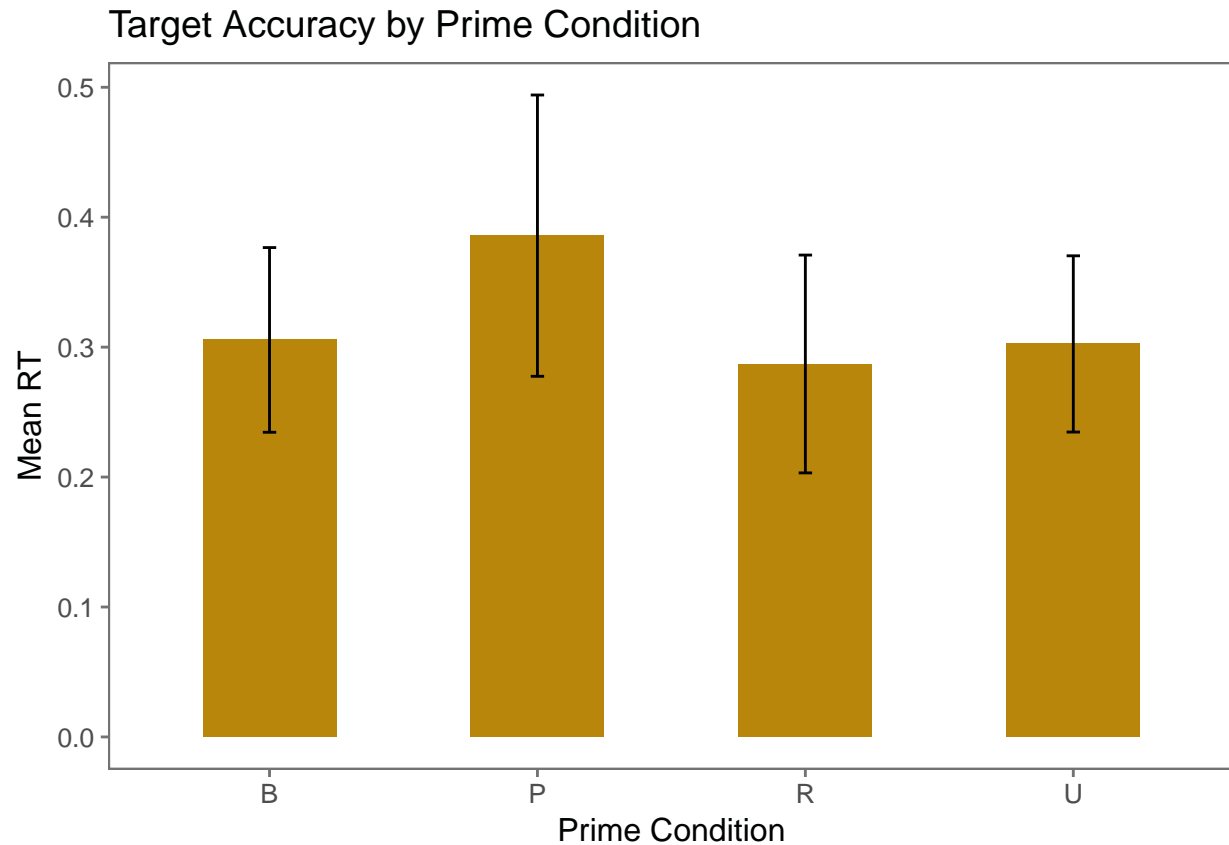
### Target Accuracy Figure

```
library(Rmisc)

## Loading required package: lattice
## Loading required package: plyr
## -----
## You have loaded plyr after dplyr - this is likely to cause problems.
## If you need functions from both plyr and dplyr, please load plyr first, then dplyr:
## library(plyr); library(dplyr)
## -----
##
## Attaching package: 'plyr'
##
## The following objects are masked from 'package:dplyr':
##
##   arrange, count, desc, failwith, id, mutate,
##   rename, summarise, summarize

target_rmisc = summarySE(prime_subject_acc,
                          measurevar = "TargetAccuracy",
                          groupvars = c("PrimeCondition"))

library(ggplot2)
library(ggthemes)
ggplot(target_rmisc, aes(x = PrimeCondition, y = TargetAccuracy))+
  geom_bar(stat = "identity", position = "dodge", width = 0.5, fill = "darkgoldenrod")+
  geom_errorbar(aes(ymin = TargetAccuracy - ci, ymax = TargetAccuracy + ci),
               width=.05, position=position_dodge(.5)) +
  theme_few()+
  xlab("Prime Condition") + ylab("Mean RT") +
  ggtitle("Target Accuracy by Prime Condition")
```



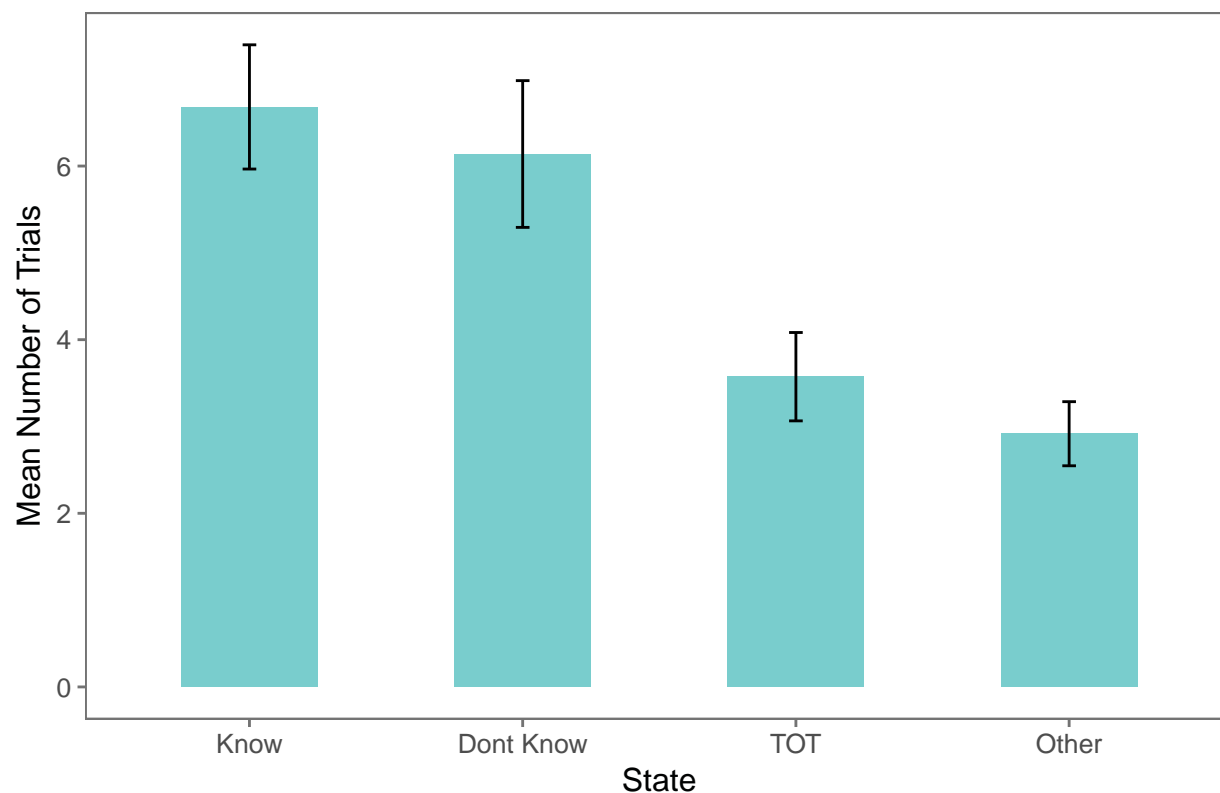
## Raw State Data

```
library(Rmisc)
state_overall = summarySE(prime_subject_state,
                           measurevar = "count",
                           groupvars = c("State"))

library(ggplot2)
library(ggthemes)
state_overall %>% mutate(State = factor(State, levels = unique(State),
                                         labels = c("Know", "Dont Know",
                                                     "TOT", "Other")))%>%

  ggplot(aes(x = State, y = count))+
  geom_bar(stat = "identity", position = "dodge",
           width = 0.5, fill = "darkslategray3")+
  geom_errorbar(aes(ymin = count - ci, ymax = count + ci),
               width=.05, position=position_dodge(.5)) +
  theme_few()+
  xlab("State") + ylab("Mean Number of Trials") +
  ggtitle("State Data by Prime Condition")
```

## State Data by Prime Condition



## State by Prime Type

```
library(Rmisc)
state_rmisc = summarySE(prime_subject_state,
                        measurevar = "count",
                        groupvars = c("PrimeCondition", "State"))

library(ggplot2)
library(ggthemes)
prime_state$State = as.factor(as.numeric(prime_state$State))
state_rmisc %>% mutate(State = factor(State, levels = unique(State),
                                     labels = c("Know", "Dont Know",
                                                "TOT", "Other")))%>%

  ggplot(aes(x = PrimeCondition, y = count, fill = State))+
  geom_bar(stat = "identity", position = "dodge", width = 0.5)+
  geom_errorbar(aes(ymin = count - ci, ymax = count + ci),
               width=.05, position=position_dodge(.5)) +
  theme_few()+
  xlab("Prime Condition") + ylab("Mean Number of Trials") +
  ggtitle("State Data by Prime Condition")
```

