Physical Pragmatics (Experiment 2b)

Preprocessing

Exclude participants from Pachual due to data quality concerns, as well as participants that answered ‘unsure’ since they are just noise.

```
# Read in the demographics and the participant data (excluding Pachual).
data_0 = read_csv(file.path(data_path, "raw_data.csv"))

# Decode the unique_id column.
data_1 = data_0 %>%
  separate(unique_id, into=c("date", "community", "participant"), "_")

# Exclude participants that answered 'unsure'.
exclusions = filter(data_1, response=="unsure")$participant
data_2 = data_1 %>%
  filter(!(participant %in% exclusions)) %>%
  select(participant, age, first_trial, door, object, response)

# Write the preprocessed participant data.
write_csv(data_2, file.path(data_path, "data.csv"))
```

Compute Door Endorsement

Here we analyze participant door endorsement (N=133, M=33.12 years, SD=15.4 years), collapsing across the door presentation order.

```
# Read in the preprocessed participant data.
data_2 = read_csv(file.path(data_path, "data.csv"))

# Set up the bootstrap functions.
compute_mean = function(data, indices) {
  return(mean(data[indices]))
}

compute_bootstrap = function(data, d) {
  bool_data = data %>%
    filter(door==d) %>%
    mutate(response=ifelse(response=="leave", 1, 0))

  simulations = boot(data=bool_data$response,
                     statistic=compute_mean,
                     R=10000)
```

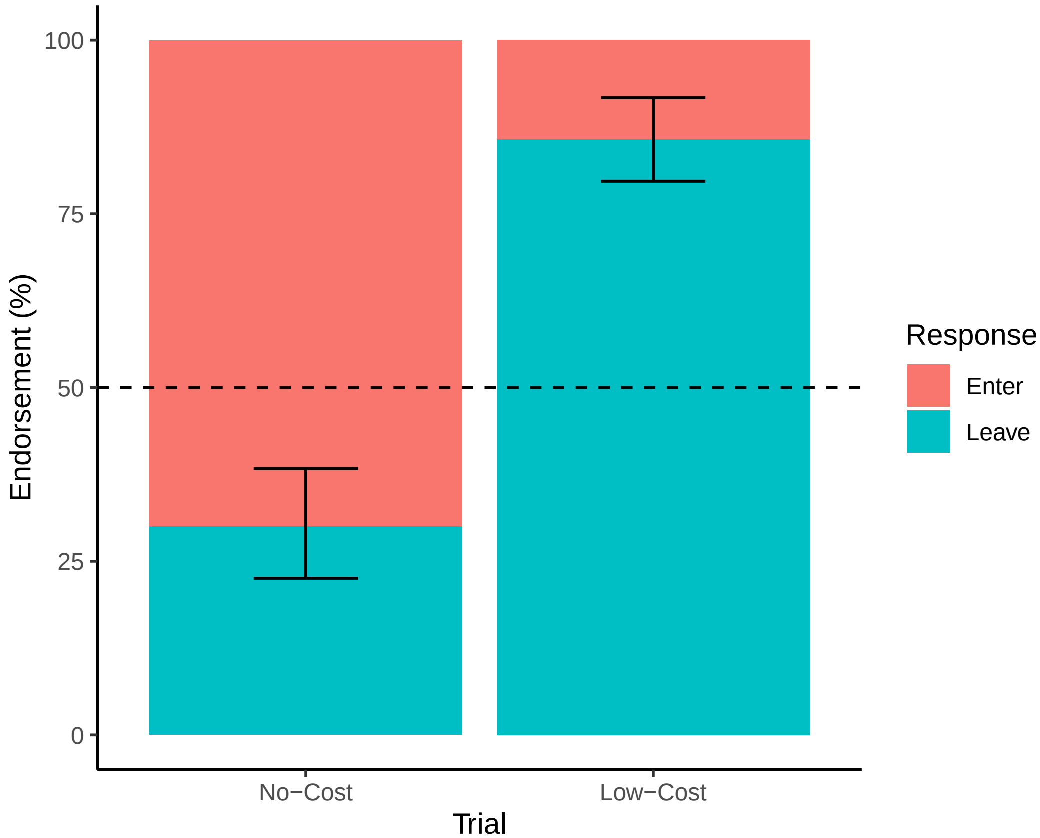
```r
  return(boot.ci(simulations, type="perc")$perc)
}

# Compute the bootstrapped 95% CIs for the participant endorsement for leaving.
set.seed(seed)
ci = data.frame()
bootstrap_data = compute_bootstrap(data_2, "no_cost")
ci = rbind(ci, data.frame(lower_ci=bootstrap_data[4],
                          upper_ci=bootstrap_data[5],
                          door="no_cost"))

bootstrap_data = compute_bootstrap(data_2, "low_cost")
ci = rbind(ci, data.frame(lower_ci=bootstrap_data[4],
                          upper_ci=bootstrap_data[5],
                          door="low_cost"))

# Collapse endorsement for leaving across conditions.
data_3 = data_2 %>%
  group_by(door) %>%
  summarize(leave=sum(response=="leave")/n()*100, enter=100-leave) %>%
  gather(response, percentage, leave, enter) %>%
  left_join(ci) %>%
  mutate(lower_ci=lower_ci*100, upper_ci=upper_ci*100)

# Plot the data.
plot_0 = data_3 %>%
  ggplot(aes(x=door, y=percentage, fill=response)) +
  geom_histogram(stat="identity") +
  geom_errorbar(aes(ymin=lower_ci, ymax=upper_ci), width=0.3) +
  geom_hline(yintercept=50, linetype="dashed", color="black") +
  theme_classic() +
  theme(aspect.ratio=1.0,
        legend.title=element_text(hjust=0.5)) +
  scale_x_discrete(name="Trial",
                   limits=c("no_cost", "low_cost"),
                   labels=c("No-Cost", "Low-Cost")) +
  ylab("Endorsement (%)") +
  scale_fill_discrete(name="Response",
                      limits=c("enter", "leave"),
                      labels=c("Enter", "Leave"))
plot_0
```




```
# Compute a binomial test on the alternative hypothesis that participants
# found the no-cost/low-cost door as a deterrent.
# NOTE: Computing a two-sided binomial test for "conservativeness".
data_4 = data_2 %>%
  filter(door=="no_cost") %>%
  mutate(response=ifelse(response=="leave", 1, 0))
binom.test(x=sum(data_4$response), n=length(data_4$response), p=0.5,
           alternative="two.sided")
```

```
##
##  Exact binomial test
##
## data:  sum(data_4$response) and length(data_4$response)
## number of successes = 40, number of trials = 133, p-value = 4.951e-06
## alternative hypothesis: true probability of success is not equal to 0.5
## 95 percent confidence interval:
##  0.2243259 0.3862872
## sample estimates:
## probability of success
##              0.3007519
```

```
data_5 = data_2 %>%
  filter(door=="low_cost") %>%
  mutate(response=ifelse(response=="leave", 1, 0))
binom.test(x=sum(data_5$response), n=length(data_5$response), p=0.5,
           alternative="two.sided")
```

```
##
##  Exact binomial test
##
## data:  sum(data_5$response) and length(data_5$response)
## number of successes = 114, number of trials = 133, p-value < 2.2e-16
## alternative hypothesis: true probability of success is not equal to 0.5
## 95 percent confidence interval:
##  0.7859324 0.9117460
## sample estimates:
## probability of success
##              0.8571429
```