

## Online probabilistic bus-catching experiment (#5004)

### Author(s)

Matthew Kay (University of Michigan) - mjskay@umich.edu  
Jessica Hullman (University of Washington) - jhullman@uw.edu  
Sean Munson (University of Washington) - smunson@uw.edu  
Michael Fernandes (University of Washington) - m.fern93@gmail.com

Created: 07/28/2017 08:05 AM (PT)

Public: 01/07/2018 12:43 PM (PT)

### 1) Have any data been collected for this study already?

No, no data have been collected for this study yet

### 2) What's the main question being asked or hypothesis being tested in this study?

Different visual presentations of uncertainty in predicted bus arrival times will result in people making better decisions in when to catch a bus in an online simulated bus experiment.

### 3) Describe the key dependent variable(s) specifying how they will be measured.

Ratio of the expected payoff given a participant's selected time to go to the bus against the expected payoff given the optimal choice. If expected payoff given participant's choice == expected payoff given optimal choice, use optimal expected payoff / (optimal expected payoff + 1) to ensure logit(ratio) is less than 1.

### 4) How many and which conditions will participants be assigned to?

~5 participants per [visualization (10 levels)] \* [scenario (4 levels)] \* [whether arrival time is shown on the right (2 levels)].

### 5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.

A Bayesian beta regression with this design:

```
brm(bf(
  expected_over_optimal_adjusted ~ vis*trial_normalized + (trial_normalized | participant) + (1 | scenario),
  phi ~ vis*trial_normalized),
  ...
)
```

And these priors:

```
pr_beta = c(
  prior(normal(0, 1), class = b),
  prior(normal(2, 2), class = Intercept),
  prior(normal(2, 2), class = Intercept, nlpar = phi),
  prior(normal(0, 1), class = b, nlpar = phi),
  prior(student_t(3, 0, 1), class = sd)
)
```

(trial\_normalized is the trial variable scaled to have a range of 1)

### 6) Any secondary analyses?

### 7) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.

We will run on at least 400 people with 30 trials per participant. We may do additional runs above 400 to ensure more balanced cell sizes (at least 5 per cell) if some cells have low numbers from the randomization.

We may also run some conditions in a second batch at a larger number of trials per participant to get a better sense of the shape of the learning curve.

### 8) Anything else you would like to pre-register? (e.g., data exclusions, variables collected for exploratory purposes, unusual analyses planned?)