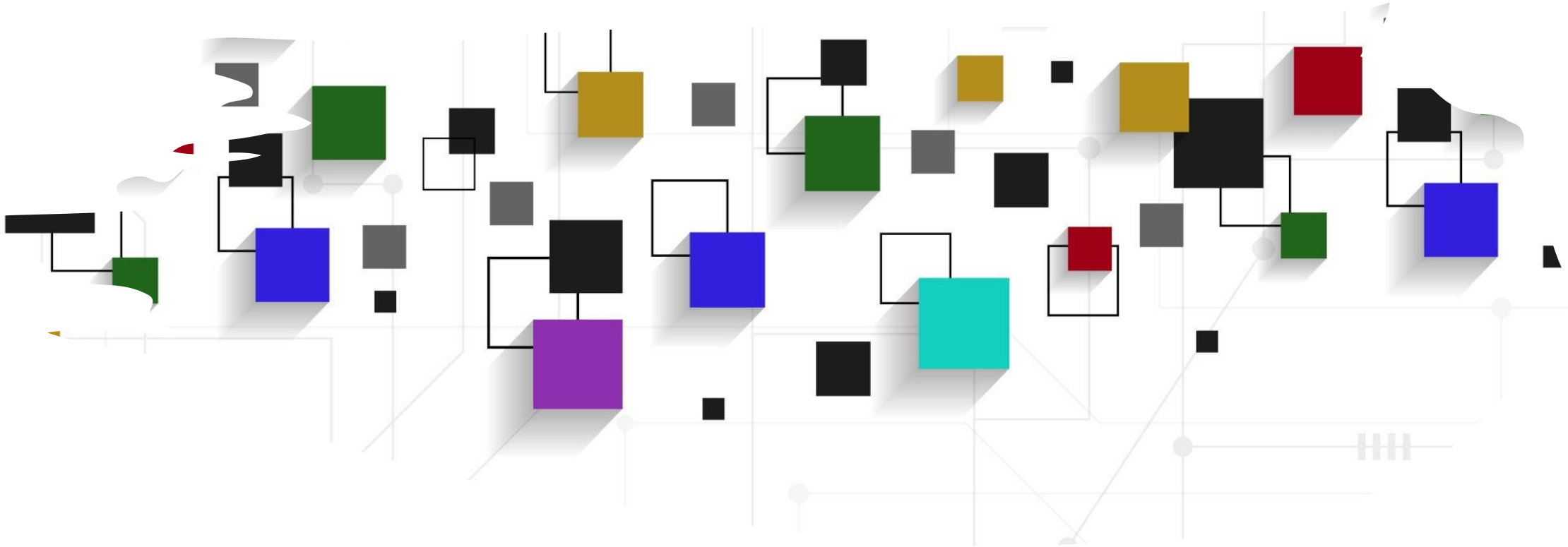


CogLab: Experiment Workflow

WEEK 6 / WELCOME BACK!

recap: pre fall break

- what we covered:
  - designing an online experiment
- your to-dos were:
  - *apply:* HW1, HW2, HW3
  - *prep*: formative milestone #1

agenda for today

- questions about jsPsych / formative milestone
- HW1/HW2/HW3 + pilot feedback
- questions about projects
- intuitions about data analysis

discussing jsPsych / formative milestone

- your repository needs to be private
- add abhilasha-kumar as a collaborator
- 1st attempt: 3%, due Oct 15
- 2nd attempt: 10%, due Oct 27
- for star coder, score on first attempt will be considered

6	Thursday, October 10, 2024	W6: Experiment Workflow
6	Sunday, October 13, 2024	**Formative Assignment (jsPsych) Due**
7	Tuesday, October 15, 2024	W7: Visualize Data
7	Thursday, October 17, 2024	W7 continued…
7	Sunday, Oct 20, 2024	**Project Milestone #4 (Full Experiment) Due**
8	Tuesday, October 22, 2024	W8: Manipulate Data
8	Thursday, October 24, 2024	W8 continued…
8	Sunday, October 27, 2024	**Formative Assignment (jsPsych) Resubmission Due**

PSYC 2740: Formative Assignment #1

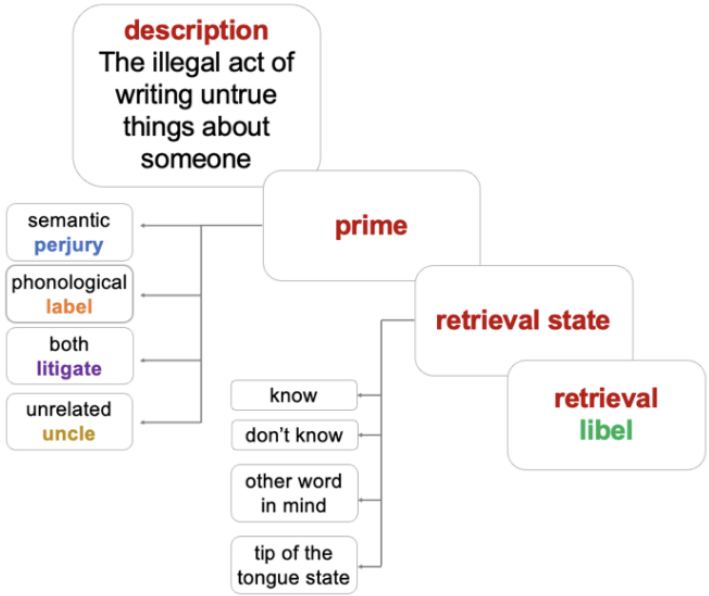
[20 points: will be scaled to 13 points towards total grade]

3 points for initial attempt
10 points for second attempt

Overview

In this assignment, you will create a new experiment based on the fundamentals we have covered in class. Stimuli you will need for this experiment are available at this link. This experiment has the following workflow:

Participants are presented with a trivia question for 5 seconds, immediately followed by a "prime" word. After seeing the prime word for a brief duration (250 ms), they are asked if they know the answer, don't know the answer, have another word in mind, or if the answer is at the tip of their tongues. Once they indicate their state, they are asked to type in their answer.



extra credit policies

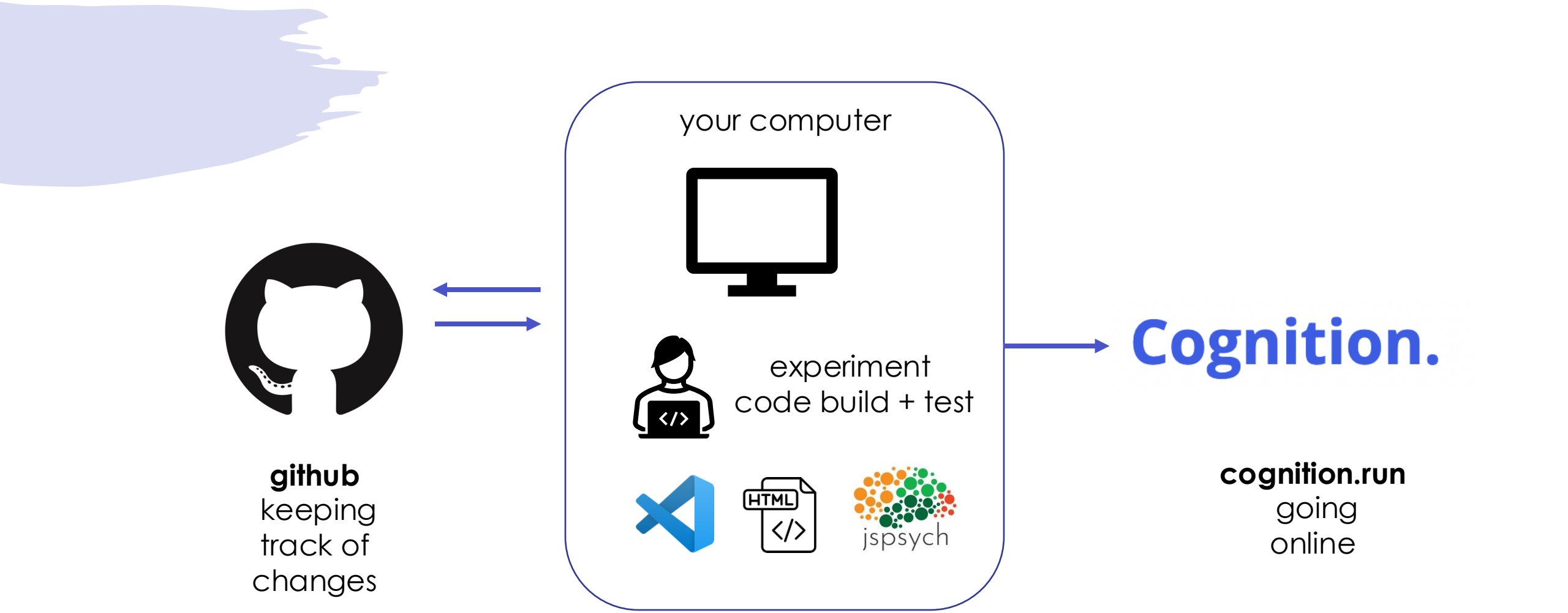
Extra credit (5 points)

There will be some opportunities to earn extra credit during the semester. These opportunities are described below:

1. Complete class surveys (2 points) : There will be 3 surveys (beginning, mid-semester, end of semester) to gather your reflections and suggestions to improve the course. With the exception of the pre-class survey (which is mandatory), all other surveys will be anonymous, and you will be able to earn 1 point for each survey you complete.
2. Win Star Coder (2 points): You will submit 3 formative coding assignments during the semester. The student who scores the combined highest score on the FIRST attempt for these assignments will earn 1 extra credit.
3. Win Team Player (1 point): Throughout the course, I will also evaluate who stood out as a team player, by observing how you participate in groups and contribute to group work. The student who stands out in this respect will earn 1 extra credit point.

office hours this week + Monday

- Thursday, 4.20 pm-5.30 pm (Prof. Kumar)
- Friday, 9 am-11 am (Prof. Kumar)
- Saturday, 12 pm – 2 pm (Uma, Kanbar 101)
- Monday, 3-4.45 pm (Prof. Kumar)


your computer
experiment
code build + test
HTML
jspsych
Cognition.
github
keeping
track of
changes
cognition.run
going
online

experiment recap

training

association

x 3

sentence

space

novel word?

<response>

word

<response>

x 3

priming

+

prime

target

A / L

homework 1: pilot

- make the experiment "participant ready"
- comment the displayData line from initJsPsych() using //
- fix all the trial durations
- provide real instructions (Savic et al. instructions here)
- pilot the whole task yourself

homework 1: sanity checks

- is the attention check response being recorded?
- is the free association response being recorded?
- can you differentiate between training / attention / association / prime / target?
- can you differentiate between prime and target trials?
- can you differentiate practice and test trials?
- is subject ID being recorded?
- is RT being recorded?

homework 2: demographics

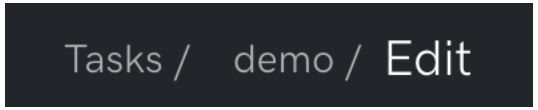
- use the different plugins to add a demographic survey at the end of the experiment
- review questions to include
- you will need to :
  - decide which questions can go on the same screen vs. different screens
  - think about how to record the data

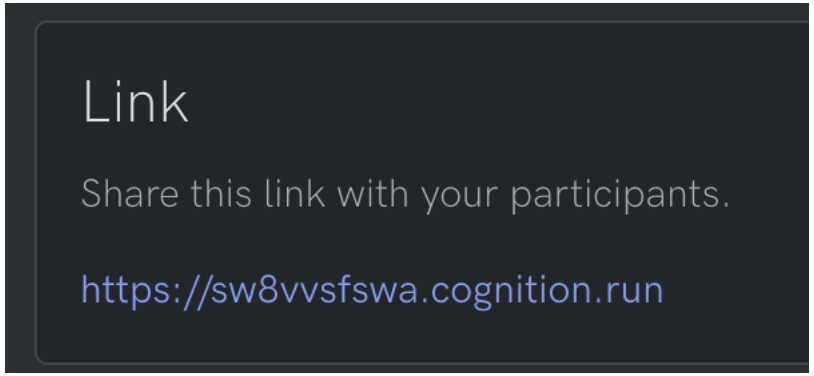
Demographics questionnaire

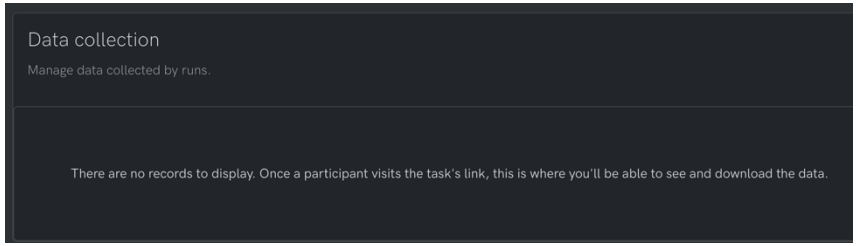
1. What is your age?
2. What is your gender?
3. Education level
   a. None
   b. Elemenrary school
   c. high school
   d. College/university bachelor
   e. College/university masters or higher
4. Please select all the racial categories that apply to you:
   a. American Indian/Alaskan Native,
   b. Asian,
   c. Black/African American
   d. Native Hawaiian or Other Pacific Islander
   e. White/Caucasian
   f. More than once race
   g. Other
5. Is English your first language?
   a. You indicated that English is not your first language in the previous question. Please answer the following questions
   b. What is your first language?
   c. At what age did you learn English?

homework 3: collect + inspect data

- go back to the task home page on cognition.run
- ask 5 friends/family to take part in your experiment via the link
- you will be able to see their data appear
- download and inspect their data after they complete the task: download a single CSV file
- perform all sanity checks!







HW1/2/3 + pilot feedback

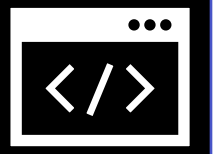
- feedback from participants?

discussing projects

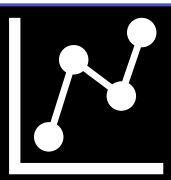
- milestone #5: full experiment (worth 7%)
- rubric available on Canvas (20 points)

where are we going?

- literature review
- asking questions
- experiment creation [HTML/jsPsych]

design 

- R & Rstudio
- describe data
- infer from data

analyze 

- pre-registration
- poster
- short report

communicate 

intuitions about data

- review Savic et al.'s results section
- what is the key research question?
- what kinds of data will answer this research question?
- which trials do we need to analyze?

preliminary analyses

- how do we calculate performance on attention check questions?
- how do we assess association task performance?

Preliminary Analyses: Attention to Sentences and Pseudoword Forms

To assess whether participants attended to the Training sentences and learned the pseudoword forms, we analyzed participants' responses on the attention check questions and the free association task.

Performance on attention check questions was high (M = .94, SD = .08), which confirmed that participants read the sentences. Performance of two participants was below .75 accuracy, so their data were excluded from the further analyses.

In the free association task, participants were asked to respond to the prompt word with one of the training triad words. They responded as instructed on an average 96% of the free association trials presented at the end of training. In addition, they tended to respond with training words that had directly co-occurred with the prompt word. Whereas 81% of participants' responses were based on direct co-occurrence, only 2% were based on shared co-occurrence regularities.[3]

priming

- which trials were analyzed?
- which trials were excluded?

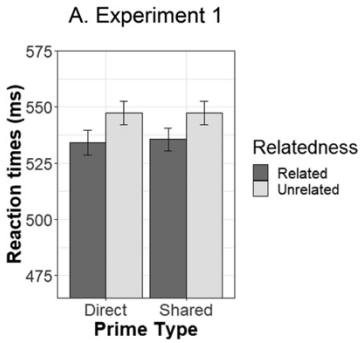
semantic priming task. Specifically, we tested whether participants more rapidly identified a familiar noun (Target: *apple*, *horse*) when it was preceded by a novel pseudoword (Prime) in the Related (Direct and Shared) versus the Unrelated (Direct and Shared) condition. Following the logic of extensive semantic priming research (e.g., McRae & Boisvert, 1998), if participants linked pseudowords with familiar words based on direct and shared co-occurrence, pseudowords should prime the familiar words from the same triad. Specifically, novel pseudowords should allow participants to respond more quickly to Targets from the same triad (Related condition) than to Targets from the opposite triad (Unrelated condition). Prior to analyzing reaction times, we removed data from both incorrect trials, and trials with extremely short ($<$ 200 ms) and extremely long response latencies ($>$ 1,500 ms). This resulted in a removal of 5.6% of all trials. Summary statistics are reported in Table 2.

priming: model

- what were the independent variables?
- what was the dependent variable?
- what kind of statistical test was employed?

We analyzed reaction times by fitting them to linear mixed effects models with fixed effects of Prime Type (levels: Direct and Shared), Relatedness (levels: Related and Unrelated), and their interaction. The random-effects structure was based on the log likelihood ratio test (Wagenmakers & Farrell, 2004). Specifically, following Wagenmakers and Farrell (2004), we compared models with the same fixed-effects structure but varying complexity in their random-effects structure, and settled on the simplest among the candidate models that provided the best fit to the data. The best fitting random effects structure, as indicated by log-likelihood ratio test, included only a random intercept for participant and random intercept for stimuli (i.e., Triad).[4] This model revealed no significant effect of Prime Type, neither as a main effect nor in interaction with Relatedness (Fs < 1.0, ps $> .10$). Critically, the model revealed a significant effect of Relatedness, $F(1, 2443.4) = 5.85$, $p = .016$, with participants responding faster in Related than in Unrelated conditions (Figure 4A). In other words, participants responded faster to familiar words (Targets) when they were preceded by novel pseudowords with which they directly co-occurred or shared co-occurrence in training (Related Prime), than when they were preceded by novel pseudowords that directly co-occurred or shared co-occurrence with a different familiar word (Unrelated Prime).

analysis preview



phase	measure	type	exclusion criteria
attention	accuracy	descriptive	< 0.75
priming	$RT_{related}$ vs. $RT_{unrelated}$ for direct and shared pairs	inferential (mixed effects model / ANOVA)	RT < 200 ms and RT > 1500 ms correct responses related/unrelated and direct/shared trials

next class

- **before** class
  - *prep*: download R & Rstudio
    - first .pkg link for Mac from Step 1
  - *apply*: submit formative assignment #1
- **during** class
  - R 101 / visualize data