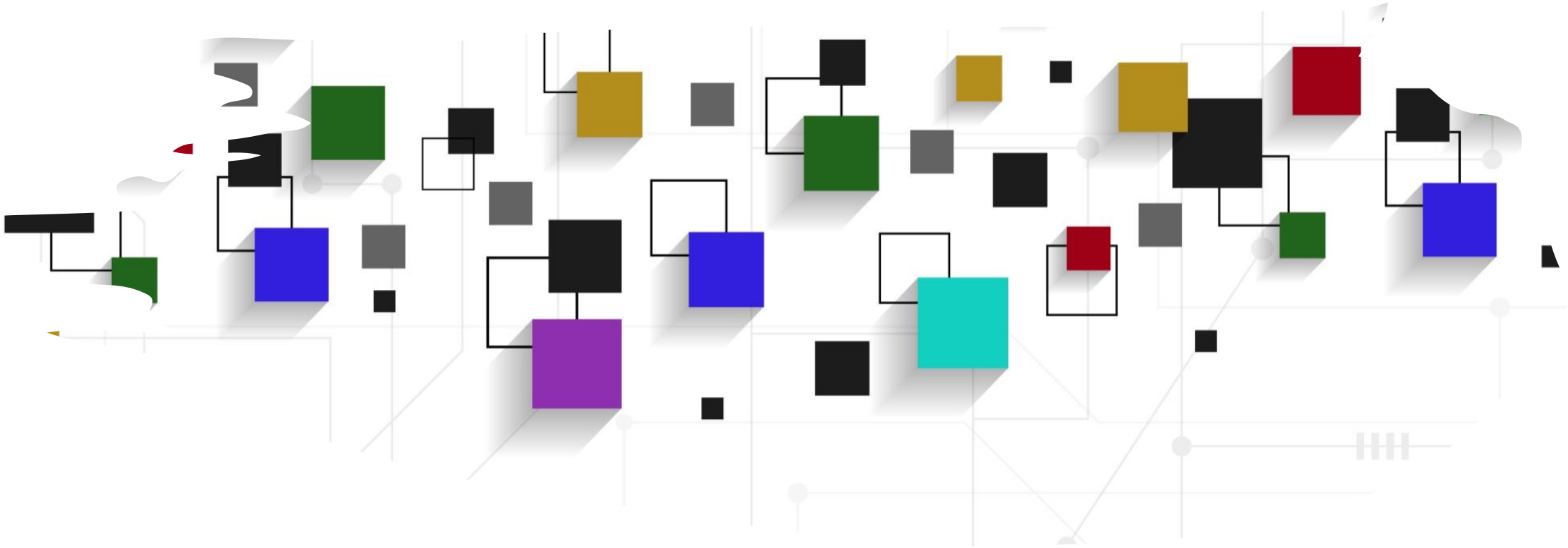
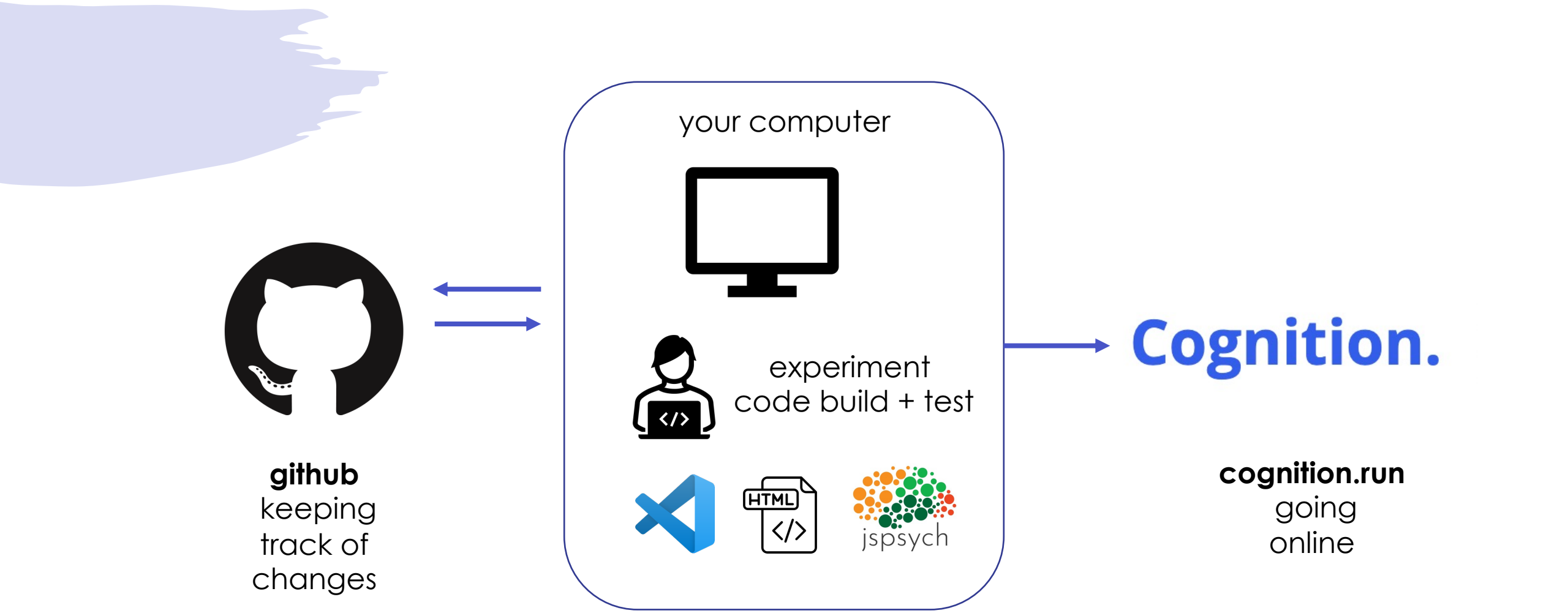


CogLab: Experiment Workflow

WEEK 7 / WELCOME BACK!

recap: pre fall break

- what we covered:
  - designing an online experiment
- your to-dos were:
  - *try*: Week 6 quiz
  - *apply:* HW1 & HW2
  - *prep*: formative milestone #1
  - *prep*: Savic et al. results section
  - *prep*: submit pilot data



github
keeping
track of
changes

cognition.run
going
online

experiment recap

training

association

x 3

sentence

space

novel word?

<response>

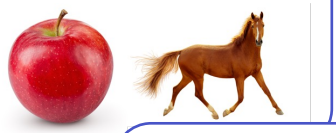
word

<response>

x 3

priming

+



prime

target

A / L

agenda for today

- questions about jsPsych / formative milestone
- questions about projects
- intuitions about data analysis

discussing jsPsych / formative milestone

- your repository needs to be private
- add abhilasha-kumar as a collaborator
- first attempt: worth 2%, due Oct 15
- feedback on Oct 16
- second attempt: worth 8%, due Oct 22
- for star coder, score on first attempt will be considered

discussing projects

- milestone #5: full experiment (worth 5%)
- due Oct 22
- rubric available on Canvas (10 points)

pilot feedback

- upload your data by Friday latest (link on Canvas)
- feedback from participants?

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?

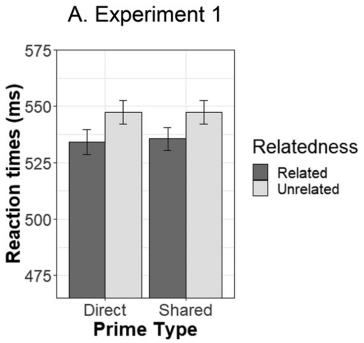
semantic priming task. Specifically, we tested whether participants more rapidly identified a familiar noun (Target: *apple*, *horse*) when it was preceded by a novel pseudoword (Prime) in the Related (Direct and Shared) versus the Unrelated (Direct and Shared) condition. Following the logic of extensive 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
association	proportion of correct/congruent responses + direct/shared responding	descriptive	
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 for mac (first .pkg link)
  - *prep*: download Rstudio
  - *prep*: Programming Basics primer from posit
  - *apply*: formative assignment #1
- **during** class
  - R 101