

Running web-based experiments

Web-based experiments

Website with useful resources:

<https://sebschu.github.io/lisa-web-based-experiments/>

Companion paper:

Degen, J. & Tonhauser, J. (2022). Managing web experiments for psycholinguistics: An example from experimental semantics/pragmatics. In *Open Handbook of Linguistic Data Management*.

Why run web-based experiments?

- more efficient data collection than in the lab
 - faster
 - cheaper
- larger & more diverse participant population (not just college undergrads)
- ...the pandemic

Buhrmester et al 2011

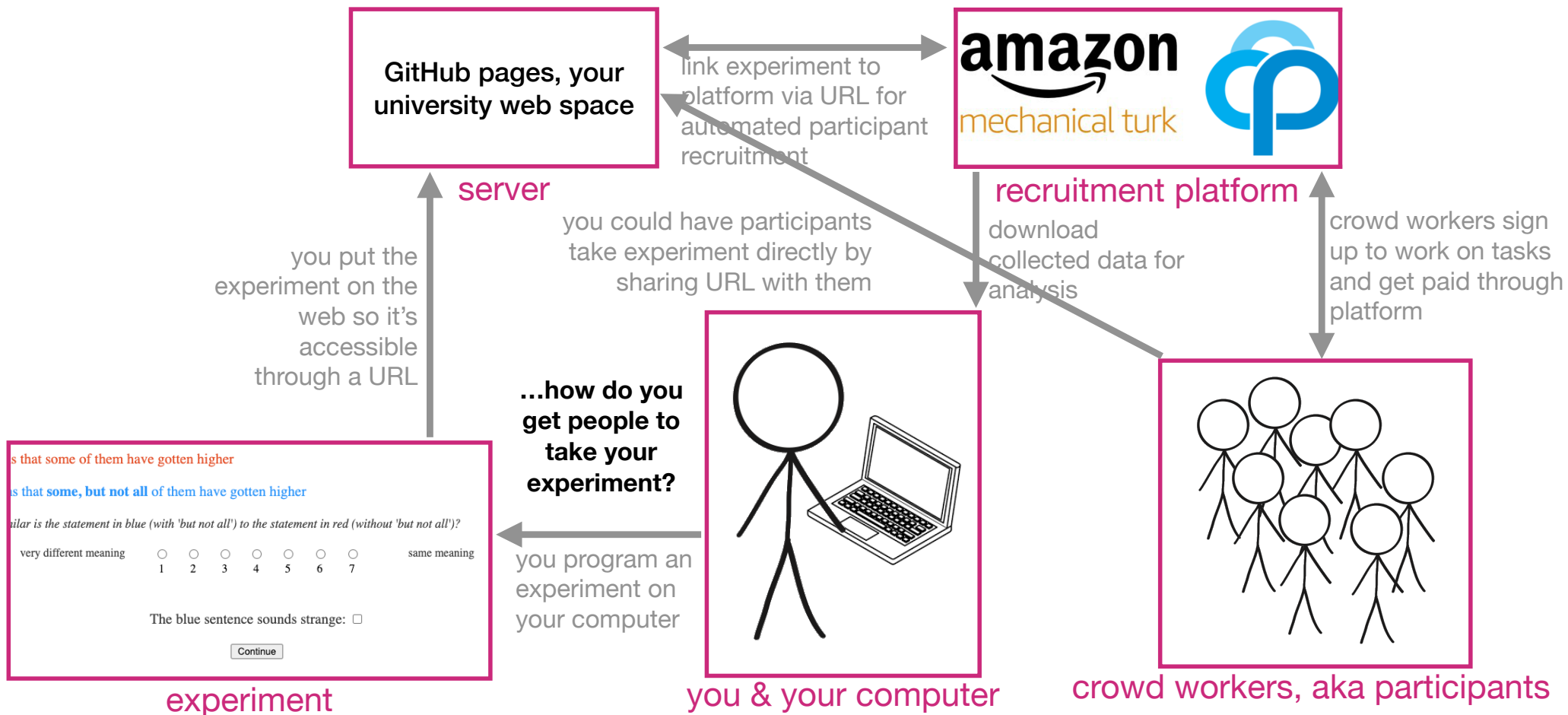
Concerns about web-based experimentation

- participants don't pay attention over the web **attention checks**
- no control over participant population **demographic parameters, “qualifications”**
- data is noisy **many classic findings have replicated remedies**
- difficult to learn
- too many tools/choices **that's why we're here!**
- don't know how to code











...additional concerns?

How do crowd-sourced experiments work?

How do web-based experiments work?



Workflow

Step	Tool	Time
1. create organized, version-controlled project repository	 	mins
2. program experiment and test in local browser	  	hrs
3. put experiment on server and test again	scp/GitHub pages/...	secs + mins
4. preregister experiment	 OSF	mins-hrs
5. link experiment to platform (and test again in Sandbox)	<u>proliferate/</u> <u>submitterator/...</u>	secs + mins
6. run experiment on platform	 	hrs to days
7. download data from platform	<u>proliferate/</u> <u>submitterator/...</u>	secs
8. pre-process, visualize, analyze data	 	hrs
9. ...publish!		...

What kinds of experiments can you run?

- categorical or continuous choices (eg truth-value judgment, acceptability)
- response time measures (eg self-paced reading, timed lexical decision)
- free-form input (eg for written production)
- spoken and signed production (possible but requires more setup)
- mouse-tracking
- even basic eye-tracking (example here: https://github.com/leylakursat/cohort_webgazer)

What kinds of experiments *can't/shouldn't* you run?

- brain imaging (EEG, MEG, fMRI)
- psychophysical studies requiring very temporally controlled stimulus presentation
- unclear: more complex eye-tracking setups thus far not validated
- unclear: special populations (for children see <https://lookit.mit.edu/>)

Today

Step	Tool	Time
1. create organized, version-controlled project repository	 git 	mins

Choices, choices

Platforms

Peer et al 2017

- **Amazon's Mechanical Turk (US-based)**

- large population of workers (~500,000, mostly US-based)
- diverse, but nevertheless biased

“workers are diverse but not representative of the populations they are drawn from, reflecting that Internet users differ systematically from non-Internet users. Workers tend to be younger (about 30 years old), overeducated, underemployed, less religious, and more liberal than the general population. Within the United States, Asians are overrepresented and Blacks and Hispanics are underrepresented relative to the population as a whole”

Paolacci & Chandler 2014

- many bots and bot-like workers

- **Prolific Academic (UK-based)**

- smaller than MTurk
- higher data quality
- more linguistic diversity

- **Others: TurkPrime, Daemo, Finding Five**

Experimental frameworks

- psiTurk — maintained by Todd Gureckis
- jsPsych — maintained by Josh de Leeuw ← what we'll use
- _magpie — maintained by Michael Franke

Tips and tricks, experimental setup

For participants' sake:

- in experiment:
 - always include consent/legal info
 - include thorough but concise instructions
 - include a progress bar (lowers dropout)
- on platform:
 - give your study a straightforward name
 - include keywords that make it easy to find
 - study communication stanford fun cc



InterActive Language Processing Lab at Stanford

In the following experiment, you'll see a series of visual scenes and be asked to complete sentences about them. The HIT should take around 5-6 minutes. Please pay attention, and answer carefully.
Thank you!

Continue

LEGAL INFORMATION:

We invite you to participate in a research study on language production and comprehension. Your experimenter will ask you to do a linguistic task such as reading sentences or words, naming pictures or describing scenes, making up sentences of your own, or participating in a simple language game.

There are no risks or benefits of any kind involved in this study.

You will be paid for your participation at the posted rate.

If you have read this form and have decided to participate in this experiment, please understand your participation is voluntary and you have the right to withdraw your consent or discontinue participation at any time without penalty or loss of benefits to which you are otherwise entitled. You have the right to refuse to do particular tasks. Your individual privacy will be maintained in all published and written data resulting from the study. You may print this form for your records.

CONTACT INFORMATION:

If you have any questions, concerns or complaints about this research study, its procedures, risks and benefits, you should contact the Protocol Director Meghan Sumner (650) 723-4284.

If you are not satisfied with how this study is being conducted, or if you have any concerns, complaints, or general questions about the research or your rights as a participant, please contact the Stanford Institutional Review Board (IRB) to speak to someone independent of the research team at (650)-723-2480 or toll free at 1-866-680-2906. You can also write to the Stanford IRB, Stanford University, 3000 El Camino Real, Five Palo Alto Square, 4th Floor, Palo Alto, CA 94306 USA.

If you agree to participate, please proceed to the study tasks.

Tips and tricks, experimental setup

For your sake:

- in experiment:
 - to improve data quality:
 - include attention checks (eg, control trials with expected outcome)
 - include functionality to prevent experiment being taken repeatedly (UniqueTurker)
 - include functionality to identify bots/prevent them from taking experiment (eg, reCaptcha)
 - to not kick yourself later
 - always err on the side of recording too much rather than too little information
- on platform, to improve data quality
 - set participation parameters (eg, native language, percentage of previous work approved (>98%), participant location)

Tips and tricks, execution

- to improve data quality:
 - pay fairly: poorly paid studies -> unreliable data [Buhrmester et al 2018](#)
minimum California wage: \$15.50 per hour + 25% Prolific fee
 - run studies on weekdays, in the morning
- to prevent participant frustration:
 - monitor email while experiment is running

References

- Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's Mechanical Turk: A New Source of Inexpensive, Yet High-Quality, Data?. *Perspectives on Psychological Science*, 6(1), 3-5.
- Buhrmester, M. D., Talaifar, S., & Gosling, S. D. (2018). An Evaluation of Amazon's Mechanical Turk, Its Rapid Rise, and Its Effective Use. *Perspectives on Psychological Science*, 13(2), 149–154.
- Crump, M. J., McDonnell, J. V., & Gureckis, T. M. (2013). Evaluating Amazon's Mechanical Turk as a tool for experimental behavioral research. *PloS one*, 8(3), e57410.
- Degen, J. & Tonhauser, J. (2022). Managing web experiments for psycholinguistics: An example from experimental semantics/pragmatics. In *Open Handbook of Linguistic Data Management*.
- Paolacci, G., & Chandler, J. (2014). Inside the Turk: Understanding Mechanical Turk as a participant pool. *Current Directions in Psychological Science*, 23(3), 184-188.
- Peer, E., Brandimarte, L., Samat, S., & Acquisti, A. (2017). Beyond the Turk: Alternative platforms for crowdsourcing behavioral research. *Journal of Experimental Social Psychology*, 70, 153-163.