Perception, Memory, and Coordination

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Abstract

With cognitive scientists' increasing interest in moving outside of the lab, recent advances in crowdsourcing platforms can help strike a balance between the tight experimental control of lab designs and the affordances of web-based experiments to reach beyond traditional undergraduate subject pools. By taking advantage of new tools, scientists interested in social cognition and behavior can create new designs and adapt traditional ones to deliver experiments at scale. Dallinger is one such tool, providing researchers with an open-source experiment platform that provides end-to-end automation of the experiment pipeline, from participant recruitment and consent to data de-identification and participant compensation. Here we demonstrate how Dallinger can be used to run complex experimental studies of interactive human social behavior, as a demonstration of its potential to study social cognition and behavior using designs drawn from across cognitive science.

Keywords: interpersonal interaction; human communication; crowdsourcing; Dallinger

Introduction

Method

All research activities were completed in compliance with oversight from Committee for the Protection of Human Subjects at the University of California, Berkeley.

Participants

Participants (n = 12) were individually recruited from Amazon Mechanical Turk to participate as dyads (n = 6). Participants were paired with one another according to the order in which they began the experiment. All participants were over 18 years of age and fluent English speakers (self-reported), located within the U.S.

The experiment lasted an average of 11.96 minutes (range: 8.13—17.66 minutes). In return for their participation, all participants were paid $1.33 as base pay for finishing the experiment. Each participant also earned a bonus based of up to $2 for the entire experiment based on mean accuracy over all trials (mean = $1.85; range: $1.72—$1.93).

Procedure

All data collection procedures were completed through the experiment platform Dallinger (v3.4.1; `http://github.com/dallinger/Dallinger`), deployed on Amazon Mechanical Turk (`http://mturk.com`). Code for the experiment is available on GitHub (`http://github.com/thomasmorgan/joint-estimation-game`), and the resulting experiment data are available on the OSF repository for the project (`https://osf.io/8fu7x/`).

Each participant was individually recruited on Amazon Mechanical Turk to play a "Line Estimation Game" (advertisement: "Test your skills!"). Upon completing informed consent, participants were told that they would be playing a game in which they would be required to remember and re-create line lengths. Participants were informed that they would be complete their training trials individually and would then begin playing with a partner. Participants were given no information about their partner other than the guess that their partner made; no information about the partner's identity was shared.

In each trial, participants were shown 3 red lines (see figure; **NB**: add figure) and were asked to remember all three of them.[1] The 3 stimulus lines were displayed for 2 seconds then removed, providing participants with a blank screen for 0.5 seconds. Participants were then told which line to re-create (#1, #2, or #3) and were then given 1 second to submit their guess at how long the target line had been. To do so, participants were given a blank box and used their cursor to fill in the box with a blue line.

During training, participants were then shown the correct length of the target line (as a grey bar above their own guess) for 2 seconds. This was accompanied by a message telling the participant that they had guessed correctly ("Your guess was correct!") or incorrectly ("Your guess was incorrect") or that they had not submitted a guess within the 1-second time limit ("You didn't respond in time").

During testing, participants' stimulus viewing, waiting, and recreation times remained the same as during testing, but they no longer received information about whether their guess was correct or incorrect. Instead, after both participants had submitted their first guess, participants were shown their guess (in blue) above their partner's guess (in green). Both participants were then asked whether they wanted to change

[1] A pilot version of this study showed that participants adapted learned too quickly when given only 1 line to remember and recreate. The additional 2 lines were added to strictly increase the memory load, as opposed to adding difficulty in other ways (e.g., creating a moving stimulus).

their own guess or to keep the guess they had submitted. If either participant in the dyad indicated that they wanted to change their guess, that participant was then allowed to change their guess (again with a 1-second time limit) *while* still being able to view their partner's guess. Participants who chose to keep their previously submitted guess was informed that their partner chose to submit a new guess and waited for the other participant to finish. At that point, participants were again allowed to change or keep their guess. This process continued until both participants chose to keep their guess.

Participants were informed that their final accuracy would only be calculated for their final guess. However, because they had no means to communicate with their partner about whether each would be accepting or changing their guesses, each participant could not have known whether their decision to keep the guess would have been their final guess for the trial.

For clarity, we will refer to each new stimulus set as a *trial* and to each submitted line length estimate within each trial as a *guess*. This means that some participants may have submitted multiple guesses per trial. The last submitted estimate—the one by which trial-level accuracy is calculated—will be referred to as the *final guess*.

Analyses

Results

Discussion

Conclusion

Acknowledgements

Thanks go to the Dallinger development team for their assistance in executing the experiment.

This work was funded in part by the **DALLINGER GRANT INFO GOES HERE**.

References