

Getting started with Internet-based research

Overview

Survey platforms like Qualtrics, Survey Monkey, Gorilla, and others offer a variety of features that allow for different types of research, including basic surveys, surveys with randomised items and skip logic, mobile-based experience sampling surveys, as well as randomised controlled trials. Many online testing platforms also allow for collecting a variety of different types of data, including self-reports, reaction time, and psychophysics.

A crucial issue when running Internet-based studies concerns participant recruitment. What incentive will you provide to encourage people to take part in your study? There are two common approaches. One is to use a sample provider (see below), which requires paying participants for their time. Another approach is to release your study 'in the wild', which involves providing participants with feedback based on their behaviour in the study. The former is ideal when you need to collect data quickly, while the latter can be effective when there is no rush.

The advantages of using a sample provider are that you can run fairly lengthy studies and maintain respectable retention rates (as long as the pay is fair), data can be collected quite quickly (e.g. within 24 hours), and depending on the sample provider used and how much you're willing to spend, you can target participants with particular demographic characteristics. The main disadvantages are that it costs money and there is an administrative process involved in paying participants within the department, which could delay getting started with a new provider (it may take up to 2 weeks to process the invoice).

The benefits of 'in the wild' studies emerge over time. In the short term, the main advantage of this approach is that it costs little to no money. The disadvantages are that data collection may be slow, it may involve creating bespoke feedback as an incentive for participants to take part, it may require some creativity in promoting the project so people can find out about it, projects shouldn't be too long to ensure low drop-out rates, and you have little control over the characteristics of participants. However, these studies have the potential to collect data from thousands of participants.

Reliability of online methods compared to lab-based

Attention / vigilance

Some participants may split their attention between your experiment and other tasks, their phone etc, or even try to get through your study without paying attention at all (e.g. just keep

hitting spacebar, ticking “yes”). There are a couple of things you can do: (1) Incorporate some “catch” trials / questions with very simple responses that you can use to identify anyone who is not paying attention at all. (2) Depending on the platform you may be able to force your experiment window to full-screen and/or detect changes of “focus” (i.e. if the participant switches to viewing another window).

Demographics

Be aware that the convenience platforms (Prolific etc) generally don’t verify the demographic information provided by their participants. Because researchers can and do restrict studies to particular groups, this could create an incentive to give false information about e.g. geographical location, to gain access to a wider range of studies. Participants may also not honestly report any history of psychological / neurological disorders to avoid being excluded from tasks.

Fidelity of visual / auditory stimuli

Most platforms will give you some control over the devices your participants can use to access your study, e.g. excluding smartphones and tablets. However it is very difficult to control the participant’s environment, which could mean e.g. significant glare on the screen affecting visibility, colour and contrast; or significant noise disruption interfering with auditory stimuli. Again the best approach is probably to incorporate catch trials or baseline measures that will allow you to identify these participants and exclude their data.

Timing / latency of stimuli and responses

Absolute timing of events in an online study is difficult to estimate because of variation in the capabilities of the participant’s computer / device and peripherals. For visual presentation, modern LCD displays and graphics drivers introduce a delay between intended and actual time of presentation that can be as high as 100 ms in some cases (this is called [display lag](#), not to be confused with refresh rate or other measures of latency that are advertised by manufacturers). Sound drivers introduce similar delays in presenting auditory stimuli. Keyboards, trackpads and computer mice also introduce some lag in detecting responses, but these are typically much smaller, on the order of milliseconds. Fortunately these various delays can be expected to stay relatively constant for a particular participant’s setup over the course of an experiment, meaning that *relative* measures of timing within participants (e.g. difference in RT between two trial conditions) can be quite accurate. This study provides useful benchmarks (but note that display lag is not considered):

The timing mega-study: comparing a range of experiment generators, both lab-based and online. <https://psyarxiv.com/d6nu5/>

Sample providers

All providers below offer UK, US, and international samples. Cross-sectional as well as longitudinal research can be conducted on these platforms, including screening criteria (e.g. gender, age, social media use, education, etc). Most platforms will easily integrate with

Qualtrics or SurveyMonkey software. Participants are +18 so research with children is not straightforward on the (inexpensive) platforms. Panels with children, teenagers, and their parents are available from professional sampling firms.

Convenience samples (relatively inexpensive)

Prolific, Crowdfunder, Facebook (shows ads). Note it is against current University policy to use Amazon Mechanical Turk (MTurk).

National samples (quotas are applied based on national population)

Qualtrics panels, Survey Monkey, Prolific (at extra charge), TurkPrime, Pollfish (at extra charge)

Professional sampling firms (probability samples of the population, relatively expensive)

Yougov, Ipsos Mori, Gallup

'In the wild'

Online surveys and experiments people participate in for free (usually because they offer feedback or some entertainment value, such as a quiz, game, or personality test). University press office and media outlets can help draw attention to studies hosted online. Large convenience samples can be gathered this way (for free).

Online Testing Resources:

Qualtrics - <https://www.qualtrics.com> (create an account using your @cam.ac.uk email address) info here on how to sign up and use the university license:

<https://www.uis.cam.ac.uk/survey-tools/qualtrics-survey-tool>

Gorilla - <https://gorilla.sc> (see below)

Survey Monkey - <https://www.surveymonkey.com>

PsychPy (<https://www.psychopy.org>) is now supported online via <https://pavlovia.org>.

Current PsychoPy experiments can be pushed online directly. Plus, you have access to a library of experiments created by other users. You can email a link to your specific experiment to your participants or recruit participants via Sona and Prolific. Institutional license costs £1500/year

Testable (<https://www.testable.org/>) also purport to be a "ONE-STOP SOLUTION FOR BEHAVIORAL EXPERIMENTS, SURVEYS, AND DATA COLLECTION". They have offered the department a demo, and are waiving their fees until the end of 2019/20 academic year in response to C19.

Poll fish - <https://www.pollfish.com> no experience with this one, but offers survey tools and access to representative samples

Gorilla

The department has purchased a licence to the Gorilla Online Experiment Builder (www.gorilla.sc). To be automatically added to the Cambridge subscription when you sign

up, use the enrollment code CamGEB2020. If you already have an account, you can also add this via your My Account page. Support info here:

<https://gorilla.sc/support/reference/subscription-administrators#howdoenrolmentcodeswork>

Some of us went through a demo of the **Gorilla** software that allows setting up experiments, including reaction time studies. It therefore offers more functionality than **Qualtrics**, which works well for simple surveys. One thing that was noteworthy is that they also offer consulting services, where they build experiments for users. Funding for this could be requested as part of grant applications. They give quotes on a case-by-case basis. Here is some info that the CEO of the company, Jo Eversted, shared with us after the session:

- * BRM Paper: <https://link.springer.com/article/10.3758/s13428-019-01237-x>

- * Timing Paper: <https://psyarxiv.com/jfecal/>

- * Speech perception tutorial:

<https://slaplab.uconn.edu/2020/03/15/tutorial-for-conducting-speech-perception-experiments-online/>

- * Consulting Case Studies: <https://gorilla.sc/casestudies/consulting>

- * Read interviews with pioneering researchers: www.gorilla.sc/spotlights

- * Find out how Gorilla changed the teaching of Research Methods at UCL: www.gorilla.sc/casestudies

- * See screenshots of the gorgeous experiment authoring tools: www.gorilla.sc/tools

- * Watch the onboarding videos to watch an experiment built and launched online in under 30 minutes: <https://gorilla.sc/support/getstarted>

- * Experience some classic tasks built in Gorilla: www.gorilla.sc/support/samples

- * See a list of Gorilla features:

 - <https://gorilla.sc/support/articles/features>

 - o Including Reaig Zone, Mouse tracking, Eye tracking, Gabor patch and more

- * Testimonials: <https://gorilla.sc/info/testimonial>

- * Publications citing Gorilla: <https://gorilla.sc/publications>

This came from Steve Johnston, Swansea:

If anyone is interested or desires it - I put together a tutorial for using Gorilla 2 years back for preparing second years for their final year project. The tutorial has them make this...

<https://vimeo.com/402144880>

If anyone is interested the tutorial for how to build it is here...2nd years seemed to follow it OK.

<https://vimeo.com/402144995>

You're more than welcome to use it/adapt it/bin it to your heart's desire. If you want those specific picture resources (and more usefully the excel spreadsheet for the example trial

structure) I have those too and they are the Dept's own, so free for me to share - just email me and I'll prepare a link.

Ethics and consent

Online experiments raise relatively few ethical concerns as they are necessarily non-invasive, but there are some important areas that need to be considered, and ethical approval must be obtained as for in-person testing. Most online experiments are suitable for submission to the Psychology Department's Ethics Committee (PEC). The main exception would be studies that recruit under 18s which require special consideration (see below). The committee's webpage (intranet link below) hosts a template information sheet and online consent form suitable for web-based experiments. Some of the most common ethical issues for online studies are:

- **Privacy and data handling:** online participants are usually anonymous, but note that IP address, if collected, may be considered personal information under data protection legislation.
- **Possibility of psychological discomfort or harm:** e.g. distressing images or imagined situations, questions that could suggest undiagnosed mental health problems, or asking participants to reveal sensitive or intimate information.

https://www.psychol.cam.ac.uk/ethics_committee (Raven login reqd)

Under 18s: Studies that recruit under 18s will need to be approved by the Psychology Research Ethics Committee (PREC, distinct from the PEC) or equivalent. Sarah-Jayne Blakemore's group has been using MTurk, Prolific, Qualtrics and Gorilla for experimental tasks and questionnaires, as well as online consent forms, over the past few years. The paragraph below is an example for ethics applications of justifying using electronic informed consent. You can view a recent electronic parental information sheet and consent form [here](#).

"It is important that parental consent may be obtained electronically (if preferred) because many schools insist on this arrangement for the practicalities of class-based testing. Specifically, giving parents the choice of consenting electronically (email/online) or using a paper consent form increases the chances that all parents in a class will respond (one way or the other), thereby reducing the problem of having to exclude some students from the class because their parents have not responded. Many schools are not willing to run a classroom-based testing session from which some students are excluded."

List of people in the department with experience collecting data over the Internet

Jason Rentfrow - Qualtrics, survey development, mobile-phone surveys, momentary assessments, integrating audio/video stimuli, creating bespoke feedback for participants, in the wild recruitment, harvesting data from social media and google search trends

Sander van der Linden - Qualtrics, survey design and development, Java-script (Qualtrics) for behavioral tasks (stroop test, IAT, game-based interventions), integrating audio/video stimuli, recruiting participants from online platforms Prolific (UK), Mturk (US), Qualtrics panels (US/UK) and mining online social media data using R or Python (Twitter, Reddit).

Paul Bays - visual psychophysics, memory and reward learning studies, custom-coded in javascript, hosted on own servers, interfacing with MTurk and Prolific

Sarah-Jayne Blakemore - my group has been using MTurk, Prolific, Qualtrics and Gorilla for experimental tasks and questionnaires, as well as online consent forms, over the past few years. We usually include the paragraph below in our ethics applications to justify using electronic informed consent. You can view a recent electronic parental information sheet and consent form [here](#).

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Simone Schnall - Qualtrics, recruiting participants from online platforms Prolific (UK), Mturk (US), and mining online social media (YouTube; Twitter).

Will Skylark

Lee de Wit - Qualtrics surveys, and online recruitment platforms like Prolific, and YouGov. Developed an online visual perception screening test (using custom software), and have used software platforms Palovia and <https://www.psytoolkit.org/> for running cognitive tasks online.

Greg Davis - Limited experience with running visual search experiments using Gorilla (combined it with Prolific for recruitment).

Maité Crespo García - I have some fresh experience with programming a cognitive task (visual stimuli and keyboard responses) in JavaScript using the jsPsych library (<https://www.jspsych.org/>) and uploading it to Pavlovia platform for piloting and saving data. 1) I am interested in knowing whether some researchers at the department have experience with Pavlovia and/or JATOS for running whole experiments. To Pavlovia users: have you experienced any difficulty? Is there any disadvantage, especially in terms of payment? How possible it is to obtain an institutional license? To JATOS users: Is there a possibility of having a server at the University for installing JATOS and hosting the online experiments there? Have you run JATOS on a cloud service? 2) Also interested in learning about

strategies to maximize data quality (e.g., ensure that participants are focused on the experiment and not multitasking). 3) Finally, how flexible and practical is Qualtrics for programming custom cognitive tasks (outside surveys)?

Kanad Mandke -

- 1) Interested in knowing delivery of auditory experiments as the variables affecting optimum stimulus delivery are higher (i.e., sound card, headphones, size of the stimulus files etc).
- 2) Synchronisation between auditory-visual stimulus delivery.

Deborah Talmi - I'd like to learn to use one of the platforms to present stimuli to participants and have practical questions on what can be shown and what responses can be recorded, as well as whether it is possible to test in multiple sessions (2 days).

15/01/2021