

Conducting Online Experiments – The How To Guide

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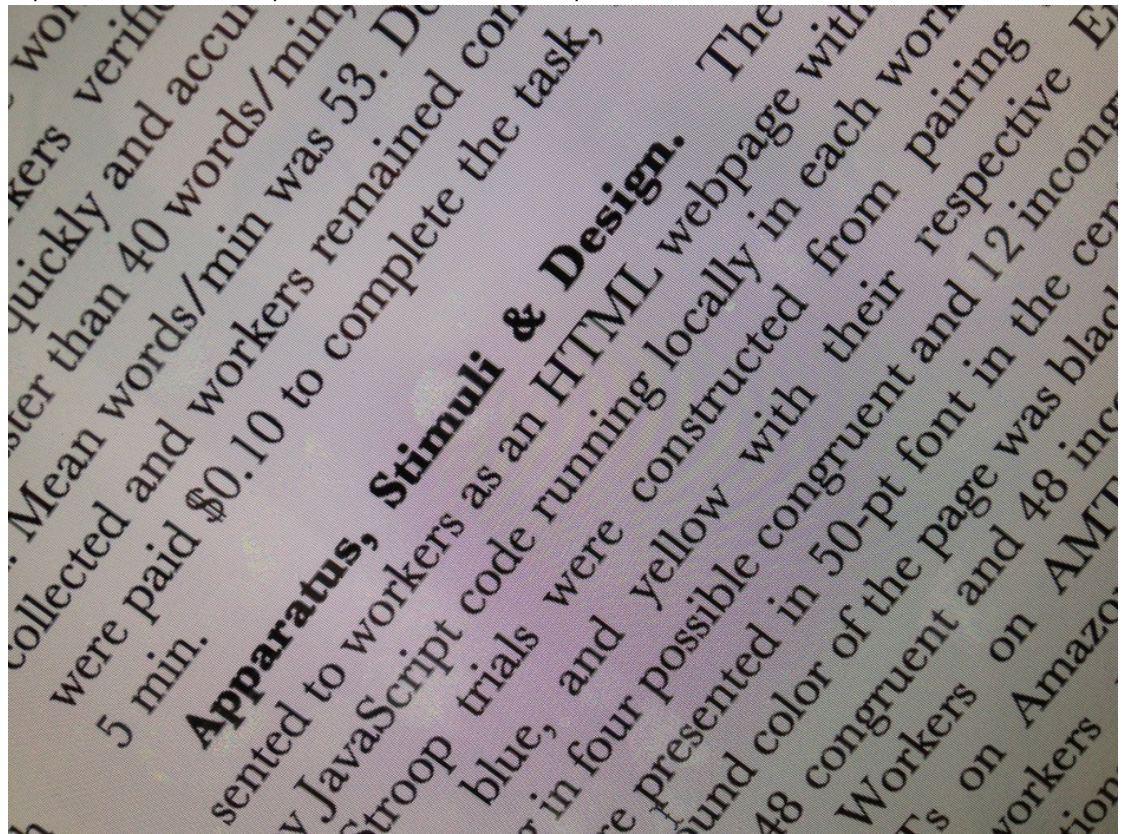
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This is a guest post from Radka Jersakova (@RadkaJersakova), who did her undergraduate degree in my lab and is now working on her PhD at Leeds University and the Université de Bourgogne in Dijon. Radka has embraced online experimentation and has run many hundreds of participants through an impressive number of experiments coded in Javascript.



Recently, [Crump, McDonnell and Gureckis \(2013\)](#) replicated the results of a number of classic cognitive behavioral tasks, such as the Stroop task, using experiments conducted online. They demonstrated that, despite what some people fear, online testing can be as reliable as lab-based testing. Additionally, online testing can be extremely fast and efficient in a way that lab-based testing cannot. I have now completed my 7th online experiment as well as having helped others in creating and advertising theirs. This post is a review of things I have learned in the process. It summarises what I did not know but now wish I had when I was planning my first study and answers some questions I got asked by others along the way.

CREATING ONLINE EXPERIMENTS

In terms of conducting online experiments, the best method remains programming as it is by far the most flexible approach. As someone who has learned programming on my own from free online courses, I can confirm that this is not as difficult as some people think it to be and it really is quite fun (for some tips on where to get started [this TED blog post](#) is quite useful.). At the same time, many people do not know how to code and do not have the time to learn. The good news is that for many experiments, the current survey software available online remains flexible enough to create large number of experiments although the potential complexity is naturally limited. My favorite is [Qualtrics](#) as even the free version allows a fair amount of functionality and number of trials.

FINDING PARTICIPANTS

A major advantage of the Internet is that one can reach many different communities. With online testing, one can reach participants who are simply interested in psychology experiments and volunteering in a way that is preferable to testing psychology undergraduates who are coerced into participating for course credit. Once you have an experiment to advertise, the challenge is to find the easiest route by which to reach these people.

There are many websites that focus directly on advertising online experiments. The one I have found the most useful is the [Psychological Research on the Net](#) website administered by John H. Krantz. Alternatively, the [In-Mind magazine](#) has a page where they post online experiments, which they also share on their Facebook and Twitter account. Other websites that host links to online studies are the [Social Psychology Network](#) and [Online Psychology Research](#).

The most powerful way for a single individual to reach participants is, quite unsurprisingly, social media. Once a few people start sharing the link, the interest can spread very quickly. The simplest thing to do is to post your study on your Facebook page or Twitter account. Something I haven't tried yet but that might be worth exploring is finding pages on Facebook or hashtags on Twitter that might relate to the topic of the experiment or psychology in general and post the link to the experiment there. One of the biggest successes for me though, remains reddit. Reddit has a very strong community and people spend time there because they are actively searching for new information and interesting projects. There are a number of subreddits that are specific to psychology so yet again, visited by people interested in these particular topics. To give a few examples: [psychology](#); [cognitive science](#); [psych science](#); [music and cognition](#); [mathematical psychology](#) and the list goes on! There is even a subreddit specific to finding participants to complete surveys and experiments simply called [Sample Size](#).

The last resource I have tried a number of times is using more general advertising sites such as [craigslist](#). There is always a 'volunteers' section, which is visited by people *looking* to volunteer for a project of some sort. In that sense it can be a good place to reach participants and the sample will be fairly diverse. This for me has never been as successful as using social media but a few times it has worked fairly well.

USEFUL CHECKPOINTS

The most commonly heard argument against online testing is the lack of control. Really what this means is that data collected online might include more noise, making it easier to miss existing effects, than traditional lab-based experiments. As already mentioned, Crump et al. (2013) replicated a number of classic tasks online suggesting that this might not be as big a worry as it at first seems to be. The range of tasks they have chosen demonstrates nicely that the same results can be obtained in the lab as well as on the Internet. Nevertheless, there are a number of ways one can track participants' behavior to determine whether sufficient attention was given to the experiment. The simplest way is to measure the time participants took to complete the study. If you are using existing survey software, this information is usually automatically provided. If you are programming the study yourself, requesting a

timestamp for when the study begins and for when it ends is an easy way to track the same kind of information. If participants are abnormally slow (or fast) in completing a task, then one might have sufficient reasons to exclude the data.

One of the biggest problems I have encountered is a participant completing one part of the task (e.g. a recognition test) but not completing as faithfully another part of the same experiment (e.g. free report descriptions of particular memory experiences from her daily life). While due to ethics we were not allowed to force participants to respond to any question, I have found that simply asking if they are sure they want to proceed, in case that they haven't filled out all the questions on a page, increased report rates dramatically. As such it can be useful to provide such pointers along the way to make sure participants answer all questions without forcing them to do so.

Crump et al. (2013) also point out from their experiences of online testing that it can be useful to include some questions about the study instructions. One could simply ask participants to describe briefly what it is that they are expected to do in the experiment. This way one has data against which to check whether participants understood the instructions and completed the task as anticipated. It will probably also help to ensure that participants pay close attention to the instructions. This is particularly useful if the task is fairly complex.

DEALING WITH DROP OUTS

A big disadvantage of online testing can be dropout rates. This isn't something I have tested in any formal way but it does seem that there is at least some relationship between the length of the study and dropout rates. This means that online testing is definitely most suitable to studies, which are up to 15 or 20 minutes in length to complete and this might be something to consider. It is also certain that tasks, which are more engaging, will have lower dropout rates. A good incentive I have found is to give participants at the end of an experiment a breakdown of their performance. I have had many participants confirm that they really enjoyed the feedback on how they performed on the memory task. Such feedback is a simple but efficient way to increase participation and decrease dropout rates.

The second worry is participants' dropping out in the middle of an experiment and then restarting it. It is not something that would be common but it could happen. One way to deal with this is to ask participants to provide at the beginning of the study some code that should be unique to each participant, anonymous and yet always constant. An example is asking participants to create a code consisting of their day and month of birth and ending with their mother's maiden initials. This is hardly a novel idea, I have participated in experiments, which asked for such information to create participant IDs that allowed to link responses across a number of experimental sessions. The idea is to find some combination of numbers and letters that should never (or rarely) be the same for two participants but that remains the same for any one participant, whenever he is asked. Once in the data-analysis stage, one can simply exclude files that contain repetitions of the same code.

Once the study is up and running, other than finding suitable places to advertise it at, one can leave it and focus on other things until the data has been collected. It is possible to reach large samples quickly and these samples are often more diverse than your classic psychology undergraduate population. There is a certain degree of luck involved but I have in the past managed to collect data for well over 100 participants in a single day. That is not to say that all studies are suitable to online testing but it is definitely a resource well worth exploring.