

Implementing a Perception of Control Experiment on a Smartphone

Donal O'Sullivan, Pepijn van de Ven, Rachel Msetfi, John Nelson
Electronic & Computer Engineering, University of Limerick
donal.osullivan@ul.ie

Keywords: Electronic and Computer Engineering; Biology and Life Sciences

Abstract

In the field of psychology perception of control experiments are conducted in a controlled environment such as a lab setting. In these experiments, participants perform simple tasks, in which they are asked to assess their control over some salient outcome, after which they rate how much control they had over the experiment. Such experiments provide important insights in constructs related to mental healthiness. However, due to the use of a lab setting, results may not translate to normal day life. To test the participant in their natural day to day environment a mobile application was developed that allows these tests to be conducted throughout the participant's day.

1. Introduction

Illusory control is a phenomenon whereby people think they have more control over events than they actually do [1]. This is linked to mental healthiness whereas realistic control perceptions are linked to depression. Perception of control is usually tested using lab based tasks in which participants are repeatedly asked to perform some action and test whether or not it produces an outcome. The exact degree of control is of course programmed by the experimenter and can be compared to participant's ratings of the same situation.

Most experiments in this area are done in a controlled clinical environment where a participant is required to perform a task under supervision. However, results may not translate directly to a daily living scenario. Smartphones provide the ideal platform to present such experiments to the user in their natural environment as they are omnipresent and generally in close proximity to the participant throughout their day.

2. Original lab-based Experiment

The original experiment takes place in a laboratory setting. On a computer, users are shown a picture of a game testing room in which the user can interact with a computer screen. The participant is asked to press the spacebar if they see a blue triangle appear on the screen of the computer. If they press the spacebar when the blue triangle appears, the game generates a chime with a certain probability. Participants are also asked to not always press the spacebar when they see the blue triangle. In these cases, the system will generate a chime with a given probability. The intention behind this is that the participant is presented with an experiment in which they have a well-defined amount of control over the sounding of a chime. This predefined control can then be compared with the user's subjective assessment of control. Hence, once the

participant completes the task, they are asked to judge how much control they had of their environment. They are also asked to judge how much control the external environment had in generating the chime.

3. Perception of Control App

To start an experiment, the experimenter will setup various parameters through a web interface. These include: how long the experiment runs for, the number of trials they would like to run during the experiment, the probabilities used in the experiment, the average time between each notification, and when to schedule the scoring system used by the participant to score how much control they felt they had. These data are stored on a server and synchronized with the participant's phone. Trials are scheduled by the server and pushed to the user's device; from here each trial is presented to the user as a notification. Once the notification appears, the participant has two minutes to start the trial. Initially the trial screen is blank for 3 seconds after which a button appears on the screen for 2 seconds. If the participant presses the button in time they are rewarded with a chime. However, the provision of rewards is provided with a certain probability set by the experimenter. For example, when the button is pressed it will generate a sound only 75% of the time. If the user does not press the button there is also a certain probability that the trial will generate a chime regardless. These trials will be performed throughout the participant's day with the scheduling of the notifications being done via a variable interval schedule [2]. This allows for a varying time between each notification so the participant does not learn the pattern or time between each notification. After a specified number of trials the participant is asked to rate how much control they felt they had over the trial generating a chime and how much control their environment had over the trial making a chime.

4. Outlook

Comparison of the data generated by the app to the original lab-based experiment will allow us to test the validity of these 'free living' assessments of Perception of Control. Upon validation, further tests are planned in which users perform more realistic tasks.

5. References

- [1] E.J Langer, "The illusion of control", Journal of Personality and Social Psychology, 1975.
- [2] Morton Flesher, and Howard S. Hoffman, "A progression for Generating Variable-Interval schedules", *Experiment Analysis of Behavior*, 1962, pp. 529-530.

