

## **Orienteering in Hyperbolic Space Experiment Instructions**

The experiment design is as follows. The participant will have to do two practice trials. One with the hyperbolic map and another one with the control, so no map. Then the experiment will have the following structure:

A[(practice1, practice2);(hyperbolic1, euclidean1);(hyperbolic2, euclidean2)]

B[(practice2, practice1);(euclidean1, hyperbolic1);(euclidean2, hyperbolic2)]

Randomizing order matters and I have already set that up for you to some extent. The first participant will have order A and then the next participant will have order B to have an ABABA condition order. This means the experiment is in two parts and the participant will have 10 trials per condition for a total of 20 per condition.

### **Pre-Experiment Set Up**

You will be working with the following files:

[trial\_order.xlsx, practice1.py, practice2.py, hyperbolic1.py, hyperbolic2.py, euclidean1.py, euclidean2.py]

You will need to reference trial order to edit parts of the following code files. The trial order file shows you the order of maps that the code will index and the whether you are doing condition order A or B. Per participant you will focus on the hyperbolic, Euclidean pairs on the excel sheet.

1. Open excel file and look at the first not highlighted rows. This will show you whether it is an A (hyperbolic first) or B (Euclidean first) condition order.
2. Copy the trial order from the first condition (e.g hyperbolic) and then paste it into (e.g., hyperbolic1 and 2). The first 10 numbers will go to hyperbolic 1 and the last 10 will go to hyperbolic 2.
3. The pasting will happen in code line 25 inside the order list initialization for all condition files. After you paste make sure you ctrl+s to save the file and do the same copy and pasting for the other condition.
4. Once you have the trial orders properly put into the code, highlight the two rows you used in the excel file to mark that you have already used that order pair.
5. Make sure the running room is cleared and ready to bring in a participant.

### **Experiment**

1. Once the participant has come to the lab, greet them and take them to the running room and give them 5-10 minutes to read the protocol, tell them to notify when they are done reading it. Also make sure that they leave their phone, food, and other distractions outside the running room.

2. While the participant is reading the protocol, put up signs in the lab door and running room door that an experiment is in progress
3. Once the participant is done reading the protocol, go in and ask them if they have any questions. Whether they have questions or not, do a quick summary of the experiment and lead into doing the practice maps.
4. Run the practice maps (`game_code> python practice1.py`) in the A or B order as described above. While they do the practice maps, feel free to talk to them and guide them if they are being shy or have no clue on what to do.
5. After the practice maps you will start the experiment in accord to the A or B order (`game_code> python hyperbolic1.py`). Tell them to notify you when they are done (when the maps exit). Then repeat and run the next file e.g., `euclidean1.py`.
6. After the first part (the presentation of the two conditions) let them know they have an optional 5 minute break to drink water or use the restroom.
7. Then continue to run the second part e.g., `hyperbolic2.py -> euclidean2.py`.
8. When they are done, thank them for coming and ask them if they have any questions. If they are curious about why we are doing the experiment, tell them that we are studying human behavior in network spaces and seeing what strategies we take and why.

### **Post Experiment**

1. Check the folder where the data is saved. The code tells you exactly where it is saved but it will always be in a folder called 'game\_data/part1'. If this is the 5<sup>th</sup> participant it will be in folder 'game\_data/part5'. You will need to check that in the Euclidean and Hyperbolic folders there needs to be 20 in each. If there's more or less it is a problem and take notes of it so you can notify me.
2. Immediately make time to set up the next experiment and follow pre-experiment set up procedure.