

Instruction sheet for experimenter for VR games study

1. Describe the games to users at arrival:

We made 2 virtual reality games - a virtual reality tug-of-war game and a whack-a-mole game! We are interested in providing users with the best gaming VR experience and we need your feedback for the games we designed.

Tug of war, if you have not played it, is a game in which you pull a rope with an opponent and the one that pulls stronger wins! For whack a mole you see a mole come up and you have to slap it with your right hand and hold your hand straight like this **[show participant]**.

First, for each game we must calibrate these gloves for your hands and then we can start playing. There will be a screen in front of you and you will have to follow some hand movements. I will walk you through the instructions.

We first play tug of war and then 4 minutes of whack a mole! After each game, I will kindly ask you to fill in a short survey about your experience and other design aspects. Before you leave, I will ask you for any feedback or suggested improvements you might have about each game. For full disclosure, our conversations during the experiment will be recorded. All data I record will be transcribed and anonymized. Only I have access to the code.

But before you I continue the instructions could you please have a look at these two consent forms. There is a place for your name and signature at the end. I will be here and you can ask me any questions while you read.

2. Tug-of-War Instructions

For tug of war, your task is to play the game and compete at pulling the rope! You will pull the rope 5 times and you can use both hands for that. You must put your right hand in front of the left hand on the rope and hold it like this **[show]**. I will give you the rope in your hands once we finish calibrating the gloves. Before I place the gloves on your hands could you please fill in this page from the survey with your information **[Show participant survey on laptop page and tell them to click next after inputting their data. The next page will not be filled in. Tell them you will shortly explain what that is. After they fill in the questions start putting the gloves on their hands and continue explaining.]**

In the game you will see your opponent and a countdown will begin. When you see START you should start pulling the rope and keep pulling until you see stop, When you see stop you should stop pulling the rope and the round will be over.

After each rope-pull, there will be a set of questions in VR on a panel and I will kindly ask you to read the questions out loud and tell me your answer. I will record your answers in this survey on the laptop, there [show].

You have to remember 2 things:

- 1) Pull the rope without moving your feet.
- 2) Keep your hands on the rope at all times, even when you are reading questions between rope-pulls.

3. Setup and runtime instructions

At all times:

1. Keep trackers of gloves charged
2. Keep batteries in charging port
3. Gloves demagnetized daily/several times per day
4. Always let participants know what you want to do. (eg. *I will turn off the game now*).
5. Always let participants know if you want to move them or adjust any parts of the VR setup such as the headset or gloves, especially if it involves touching them.

Before participant arrival:

1. Wipe headset
2. Check all devices are tracked
3. Put laptop speakers on the correct output
4. Experimenter starts survey
5. Adds participant ID
6. Replace batteries on gloves if needed
7. Demagnetize gloves if needed
- 8. Turn on trackers of gloves**
- 9. Turn on gloves**
10. Make sure trackers are synced with steam (they have a green light)
11. Turn on both unity projects
12. Start force meter
13. Turn on camera
14. Turn on OBS

15. Make sure Windows picks the correct webcam, the one over the force meter
16. Start Unity and open both games
17. Place Camera and Unity Game view side by side to capture them with OBS.

At start experiment

1. Greet participant.
2. Explain intro story
3. Give participant both consent forms to sign
4. Participant is invited to complete data with gender and age
5. Do you have any questions? You can ask me anything throughout the experiment.
6. Give participants gloves
7. Give participant headset protector
8. Give participants headset
9. Do glove calibration
10. Tell participants you will give them the rope in their hands now
11. Give participant rope in hands
12. Tell them to grab the rope with right hand in front of left
13. Tell participant *First I will show you the VR setup. I would like you to look around for a minute, tell me if everything is clear, if you can see your hands, the rope, and if the words on the panel are clear.*
14. Start PreTrial scene.
15. Stop scene.
16. START FORCE METER (if it turned off)
17. START RECORDING OBS
18. START RECORDING CAMERA
19. START GAME in Experiment scene
20. Tell participant: *Now I will start the game and you will be facing your opponents. Remember to start pulling when you see START and stop pulling when you see stop. Don't forget, always keep your hands on the rope.*
21. Remind participants of constraints after each 2 trials
22. At 4th rope pull, tell participant *there are 2 more rounds.*
23. For question-answering, tell participant whenever you are ready to take their answers and after each answer tell them some word of acknowledgement that you got their answer (eg. ok, Alright). Refrain from using overly positive adjectives like *great*, to prevent encouraging them to give positive answers.

4. End instructions

Note that the experiment instructions for the whack-a-mole game are not presented as they are out of the scope for this research. Participants always played tug-of-war first, completed its related survey, then played whack-a-mole and completed its related survey.

1. Thank the participant.
2. I would like to ask you now if you have any suggestions to improve the first game, the tug-of-war game? What was your impression?
3. What about the whack-a-mole game? Do you have any thoughts about that game?
4. Thank you for the feedback. One last question before you go. Could explain to me, in your own words what this experiment was about? Based on what you saw and what I explained.