**Pneumatactors Study Script**

**Pre-Participation Checklist**

* Charged:
  + VR Headset
  + Noise cancelling headphones.
  + iPhone
  + OnePlus Phone
* Correct IP noted.

**Pre-Experiment Script**

* Welcome to the HAMR lab and thank you for participating in our research study. The purpose of this study is to understand the benefits of working with soft haptic interfaces.
* The study will take approximately ninety minutes and will involve you interacting with this device along with a VR headset and an iPhone. We will ask you to place your thumb and index finger in these fingercups, and by moving your thumb and index finger you can interact with the environment.
* We don’t anticipate any mental or physical risks to you but there is the possibility of fatigue in the arm or neck, and mental fatigue from the task. To counteract this, we have broken the experiment into groups of trials with breaks in between.
* The research will provide no benefit to you. The compensation is $15 per hour, prorated at 15-minute intervals. You will receive this compensation regardless of your performance on the task.
* In the process of this study, we will be collecting data both on paper and digitally. All data will be anonymized after the session.
* Before we get started, I need you to fill out an Informed consent form. Go over it at your own pace and let me know if you have any questions. I will be behind this curtain. Once you are done, please let me know if you would like to proceed with the study.
* Thank you for filling out the form. One thing we would like to stress is that your participation is entirely voluntary and that you are free to stop participating at any point in our study. Per our study protocol you are entitled to a copy of this form so I will copy and email it to you after the study.
* Since your performance in this study is susceptible to distraction, we ask that you silence your cell phone, watch, or any other personal belonging and leave it on this table [point to the small shelf next to the entrance door] for the duration of the study, which is expected to be roughly 30 minutes.
* Before we start with the experimental task, I have a pre-experiment survey for you to fill out to gather some basic demographic information.
* I will now move back behind the curtain. Once you are done with the questionnaire, drop it into the box and let me know. Should you have any questions let me know as well.
* Thank you for filling out the questionnaire. Let’s continue with the task.

**App Script**

* This experience is divided into two main phases: a training phase and a discrimination task.
* In the training phase, you'll get a chance to explore and understand how different levels of pressure and vibration feel. You'll be interacting with four levels of pressure and four levels of vibration. You'll have two minutes to freely explore these sensations by adjusting the sliders on screen.
* Whenever you let go of a slider, the corresponding stimulus - pressure, vibration, or both - will be delivered for two seconds. After that, it will automatically stop. If you want to feel the same stimulus again, simply use the replay button. You can adjust and explore the levels as many times as you like during the training period.
* After training, you'll move on to the discrimination task, where you'll be asked to identify what kind of feedback you felt. There are three types of trials:
  + Identifying pressure only,
  + Identifying vibration only, and
  + Identifying a combination of pressure and vibration.
* In total, you'll complete 88 trials, spread across these three categories.
* During each trial, the stimulus will be delivered for two seconds. After that, you'll be able to replay it or select your response. There's no time limit per trial, and you can replay the stimulus as many times as needed before submitting your answer.
* The goal is to match what you feel to the correct feedback level based on what you learned during training.
* Between the different tasks, I will be presenting a survey asking some questions about the task. You’ll be notified of those in the task.
* [Demonstrate with u00].

**VR Script**

* This task takes place in virtual reality, where you’ll use the pneumatactors to receive haptic feedback as you interact with a virtual object.
* Once you put on the VR headset, you’ll see a virtual table with two platforms and a cylinder placed on one of them.
* Your objective is to move the cylinder back and forth between the platforms as many times as you can without breaking it.
* The proximity of your fingertips in the virtual scene determines how much force you’re applying to the cylinder.
* If your fingers are too close together (i.e., applying too much force), the cylinder will break.
* If you apply too little force, the cylinder will slip out of your hands.
* If the cylinder is dropped or thrown off the platform, it will also break.
* You’ll complete this task under three different feedback conditions:
  + Pressure-only feedback – where the pneumatactors deliver pressure in proportion to your grip.
  + Vibration-only feedback – where vibration is triggered on contact, but there’s no pressure modulation.
  + Biomimetic feedback – where vibration occurs upon contact and pressure ramps dynamically based on your grip force, mimicking real interactions.
* The goal is to find a stable grip force that allows you to successfully transfer the cylinder without dropping or breaking it.
* Each trial lasts 90 seconds.
* You’ll repeat this 3 times task across the three feedback modes. The goal is to minimize errors and maximize the number of successful transfers. At the end there will be 3 trials with no feedback.
* After each condition, you may be asked to complete a short survey to reflect on how the feedback felt or how natural it seemed.

**Post Activity Script**

* Thanks again for helping with our research. We will send an Amazon gift card to you within this week. I do have to let you know that if you receive more than $600 in compensation from studies this year the state of Maryland requires you to list this as income on your taxes. Have a great rest of your day!
* [Give them a copy of the consent form.]

**Goofs:**

03 – Feedback was off for pressure trials x1.5

04 – Feedback was off for biomimetic trials x1

11 – Turned slip to 0.4 and force threshold to 70 for Anannya in the last 6 trials.

12 – 0.4 gain 60 breakthreshold for Victor after map 3 trials (last 9)

Arush’s Map 3 data is very clean. (Trial 8/9/10)

Alex was holding the headset with her left hand.

She was in a semi-split while doing the experiment.

One survey question was entered wrong about realism.

Noah filled Map 2 for Map 1 survey.