NSF - Haptic Simulation Design

Pilot Results: 1/3 – 1/5/2010

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Overview

Between Monday and Wednesday, the team set up space in Daniels 475 workspace in DAN 475 and ran a 1-subject pilot test to verify the software and materials and demonstrate the various tasks to the team. In general, the test was successful, but some changes are still required for the experimenter instructions, complex figure software and VR software.

Follow-up Tasks

Testing

Revise the complex figure instructions to observations made during the pilot study (already completed by Zeno 1/5).

Adapt the existing Block Design instructions so they can be used with the native task (WAIS-III rules), the physical therapy condition (WASI rules) and the VR conditions (Biwen 1/14).

Integrate the completed Complex Figure, Matrix Reasoning and Block Design instructions into a single experimenter packet (Michael 1/14 or immediately following receipt of revised BD instructions).

Under the current complex figure test configuration, which includes the Omni, moving the stylus from its resting position will draw on the screen and position the cursor underneath the drawing surface. A soft platform needs to be placed on the monitor’s surface prior to testing to support the stylus above the drawing surface (Janet or Zeno).

We can keep the subject in a single place during testing if we perform the complex figure, matrix reasoning and WAIS-III block design tasks at the same table. The experimenter can sit opposite the subject (per CF, MR and BD guidelines) and cover the table with a cloth after the complex figure test is complete. This way, the subject can be focused on a single test battery.

The complex figure task should realistically simulate drawing a pattern on a surface. This means if the stylus point could come in contact with the monitor’s surface, it should appear that the stylus is “writing” on the monitor. The current output is not to scale. It should be fixed so the Omni input is 1:1 with the embedded monitor output (Linus).

No data file was produced as a result of the pilot test. This needs to be resolved as soon as possible so we can sent a test file to Dr. Tupler to adjust the scoring thresholds (Linus).

Therapy
The CRT monitor needs to be raised so the bottom of the screen is not occluded by the Phantom haptic device. A simple elevated base should be sufficient (Janet or Zeno).

The pullback feature (i.e., block returns to a start position when released above the table’s surface) still needs to be implemented in the VR. This is very important because, as observed during the test, it is possible to place blocks in the correct orientation slightly above the surface, which results in a failed design for the subject. The pullback feature will eliminate this error and train the subject to make better use of the haptic feedback for placing blocks on the surface (Linus).

The instructions should be modified to treat the first design as practice with no time limit. The subject will need some time to learn how to manipulate the blocks, and there will need to be some additional instruction for how to use the stylus (Biwen 1/14).