Follow up 5/5/2011 meeting

Attendees: Christie, Clamann, Gil, Jeon, Kaber, Lee, Manop, Qin, Tupler, Yu, Zhu

Hello everyone,
As a follow-up to the meeting on 8/19/2011, below are the notes and the action items I recorded. Please advise if I have missed anything.

**Meeting Notes**

1. Preparation for Assistive Technology paper submission
   1) Finish first draft
   2) Waiting reviews from Drs. Kaber, Lee and Tupler
   3) Journal website
      i. [http://www.tandf.co.uk/journals/journal.asp?issn=1040-0435&linktype=44](http://www.tandf.co.uk/journals/journal.asp?issn=1040-0435&linktype=44)
   4) Impact factor:
      i. 2009 impact factor is **0.659** and 2009 5-year impact factor is **1.299**.

2. Full experiment schedule with mTBI patients
   1) How to select new augmented VR features in order to decide the design of experiment
      i. (Dr. Kaber) Two ways of selecting features:
         1. Top-down or bottom-up approach:
            a. Top-down: select features based on HIP theory and category
            b. Bottom-up: first select features and see the results
               i. The “bottom-up” approach to investigating simulation features is to allow subjects access to all features (among the subset we choose) during experiment trials and to record the pattern of use of features in BD task completion. In this method, there is no fixed manipulation of feature settings.
               c. (Also we can use EMG during experiment to investigate muscle activation level (see Yingjie's dissertation))
   2) fMRI schedule:
      i. (Dr. Tupler) We can decide first day of experiment, one day after the fMRI scanning.
      ii. First fMRI must start on Monday.
      iii. Last day of experiment must be on Friday.
iv. Pre-post and therapy sessions should be from Tuesday to Thursday.

3) Experiment schedule:
   i. (Dr. Kaber): Three phases of experiment
      1. Preliminary experiment (piloting): students as a subject without fMRI
      2. First phase experiment: students as a subject with fMRI
      3. Second phase experiment: mTBI patients as a subject with fMRI

3. VR demonstration:
   1) Dr. Tupler:
      i. Flashing color should have brighter color.
      ii. What is teaching subjects?
         1. To help motor skill training not BD test.
      iii. Button click does not help ROCF motor skill training.
         1. Need circle moving hand like things to train motor skill.
      iv. When click the stimulus figure, it should show the flashing grid on the block depending on the required pattern.

   2) Dr. Kaber:
      i. Transparent block:
         1. Clicking the grid still took a time to see a transparent block.
         2. It is still cognitively complex task.
      ii. Grab by contract can reduce workload.
      iii. Two forms of instructions:
         1. Passive:
            a. Lifting block show green shadow on grid.
         2. Reciprocal (as Dr. Tupler suggested):
            a. Click stimulus figure then show highlighted grid on the block.
      3. We need reciprocal features.

   3) Zeno:
      i. Visual assistant (active assistant)
         1. (V1) Grid highlight is good for pattern recognition.
         2. (V2) Highlighted single grid and matching block is good for pattern matching.
      ii. Manual control:
         1. (M1) Rolling block (with click to pick) is good for rotating action.
         2. (M2) Grab by contact (with click to rotate) is good for moving action.
iii. Suggested DOE
   1. Base line
   2. V1 & M1
   3. V1 & M2
   4. V1+V2 & M1
   5. V1+V2 & M2

4) Janet:
   i. Subjects may get too dependent on the grid flash function in identifying the pattern. Without limitations to this assistant feature, perhaps subjects will just rely on the hint given instead of their own analysis to finish the task.

5) Caesar:
   i. The help for a specific square in the pattern should be limited to a certain number, say, three times or four times in a trial. I guess the ROCF only provides the subjects with one complete sample, which only gives them an overview of the whole pattern. So less help in a specific square in block design may encourage the subjects to better understand the whole pattern.

6) Michael:
   i. The majority of the new control-specific features and the transparency feature were designed to reduce the control gap that exists between the native task and the VR task. The gain, swiping and spinning all give the user additional options for changing the orientation of the blocks, while the transparency was designed to help build the user’s mental model of the blocks’ layout. Individually, all are good ideas, but when taken together I believe they will either create a dependency on the feature that will limit long-term task performance or distract the participants.
   
   ii. If the goal is to train the motor learning skills necessary to improve ROCF performance, I feel the increased gain (1:2) is the best solution. Implementation on this feature alone lets the participants specialize and hone their skills using a single technique that is more analogous to the tracking maneuvers used to complete the ROCF.
   
   iii. Regarding the cognitive features, I am also concerned they may be distracting when implanted together. More challenging still is that we have one feature (the advice in the upper-right portion of the workspace) that remains confusing even among members of the research team in its current form. I think that
the cognitive features can be used to help speed the learning process, but they should be removed as performance increases. I also think the grid reveal is the most useful of the features.

iv. When identifying the independent variables for the Y3 studies, we should be sure to include the version 1 visual/haptic variables as well as the v2 variables (features).

4. To do:
   1) Linus: modify a feature about reciprocal method (highlighted grid on the block).
   2) Next meeting in 2 weeks.
      i. Usability test: test new features again with different sets of VR simulation program.

These are all the items that I noted or recalled from the meeting. If you have other points, please let me know.
Guk-Ho Gil