Virtual Reality (VR) systems can affect the perception of the movements of users by providing visual feedbacks in an immersive environment. Altered visual feedback have a potential to work as intrinsic reinforcement factors to change individuals’ decision-making process and behaviors, and further to counteract the learned non-use of the more impaired limb of stroke survivors.

The objective of this pilot study is to examine whether virtual amplification of hand movements in VR system can affect the limb selection patterns of healthy subjects in unsupported reaching tasks.

**METHODS**

**Visual amplification of hand movements**
- Calculation for avatar’s hand’s position in VR (x1.5 amplification level to the right hand)

\[ x_v = (x - x_s) \times 1.5; \ y_v = (y - y_s) \times 1.5; \ z_v = (z - z_s) \times 1.5 \]

**RESULTS & CONCLUSIONS**

- 31 healthy participants (age 21.9 ± 2.9 yrs; 15 females), naive to the experiment, right-handed (Edinburgh Handedness Inventory score > 0.85), participated in this study.
- Each subject completed 5 experimental blocks of 100 unsupported reaching trials in VR.
- Seven horizontal angles used for locating targets, and the number of trials assigned at each angle (half assigned at eye level, and half at shoulder level) within each block.

- The percent of right-hand use (RHP) was used to characterize subjects’ hand selections patterns
- Two-sided paired T-test to compare the RHP of the block with visual amplification to the prior block without visual amplification implemented for both levels of visual amplification.
- When with visual amplification (either x1.5 or x2), compared to baseline, the right-hand usage significantly increased in reaching tasks.

**RESULTS**

**Table 1 Right-Hand Use Percentage Results**

<table>
<thead>
<tr>
<th>Visual Amplification Levels</th>
<th>RHP in Prior Baseline Blocks without visual amplification</th>
<th>RHP in Experimental Blocks with visual amplification</th>
<th>P value of paired T-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>X1.5</td>
<td>66.2% ±16.8%</td>
<td>73.3% ±17.3%</td>
<td>P&lt;0.003*</td>
</tr>
<tr>
<td>x2</td>
<td>63.5% ±17.3%</td>
<td>72.9% ±17.7%</td>
<td>P=0.013</td>
</tr>
</tbody>
</table>

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