MOTOR IMAGERY & SHOULDER PAIN: Establishing a normative data set for the left/right shoulder judgement task

J. D. Breckenridge, J. H. McAuley, L. Moseley, D. Butler, H. Stewart, K. A. Ginn

1. gender and hand dominance

<table>
<thead>
<tr>
<th>Gender</th>
<th>Male</th>
<th>Female</th>
<th>Left Handed</th>
<th>Right Handed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>100%</td>
<td>0%</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>Male</td>
<td>50%</td>
<td>0%</td>
<td>50%</td>
<td>50%</td>
</tr>
</tbody>
</table>

Methods

1917 participants were recruited worldwide – through social media, pain science and physiotherapy websites, physiotherapy clinics, and a network of health professionals interested in shoulder function – over a twelve month period between 1st November 2012/2013.

Participants sat at a computer to undertake the online LRJT. They first viewed a set of familiarisation images. This was followed by a set of whole upper limb images containing the shoulder of 100 different people with an equal number of right and left shoulder images. The images were rotated randomly in 90° increments for rotation of 0°, +90°, -90°, and 180°. The participants were required to identify whether the displayed image was of either the left or the right side, as fast and as accurately as possible. Primary outcomes were mean response times (RT) in milliseconds and accuracy of responses as a percentage.

Figure 1. gender and hand dominance

15th World Congress on Pain, Buenos Aires 2014. Poster number: PH-115

Introduction

The left/right judgment task (LRJT) is regarded as an implicit measure of motor imagery. It has been used to investigate painful conditions such as complex regional pain syndrome (CRPS) and chronic upper limb pain. The LRJT is also the first stage of a graded motor imagery program that is used to treat CRPS. More recently, this line of research has extended to chronic lower limb pain, back pain and neck pain.

A shoulder specific LRJT has not yet been developed to investigate shoulder problems. A critical first step before investigating shoulder problems using the LRJT is to develop a normative data set to which clinical groups can be compared and which may provide a platform for pursuing new treatment options for people with chronic shoulder pain.

Aim

The aim of this project was to develop a shoulder version of the LRJT. In particular a normal population dataset, including test accuracy and response times, for an online version of the LRJT specifically for shoulders.

Results

The mean (SD) response time for the shoulder LRJT was 1795ms (1011). Mean (SD) accuracy for the shoulder LRJT was 94.2% (8.7).

There was an effect of image rotation on RTs for the task. (See figure 3.) RTs were slowest for images that were the most rotated: 2401ms at 180°. RTs were quickest for images at 0° rotation 1434ms (p<0.01). This compared to 1667ms for images that were rotated +90°, and 1681ms for images rotated at -90°.

Similarly, there was an effect of image rotation on accuracy for the task. Participants made more errors for the images that were most rotated; accuracy was 87.9% at 180°. Participants made the least errors for images that were not rotated; accuracy was 97.3% at 0° (p<0.01). Accuracy scores were 95.7% at +90°, 95.6% at -90°.

Mean RT was affected by hand dominance; right hand dominant participants scored 215ms faster than left hand dominant participants (p=0.029).

Likewise accuracy was affected by hand dominance, right hand dominant participants scored 94.5% compared to left hand dominant participants who scored 92.4% (p=0.014).

There was no effect of gender on RT nor accuracy.

Conclusion

We modified the LRJT by the inclusion of shoulder joint images. In doing so we demonstrated that the shoulder LRJT appears to obey the principles that have been established for previous versions of the task. RTs increase along with rotation of images, and accuracy of the task declines as rotation increases.

This implies that participants use a motor imagery strategy to complete the task. The online recruitment strategy allowed us to obtain a large sample that would be sensitive to effects of gender, which were not detected.

Finally, the online protocol yields valid and complete data, providing a platform for further investigation of motor imagery in a shoulder pain population.

REFERENCES:

Contact: jbre9517@uni.sydney.edu.au