*TACSM Abstract*

# Comparison of Handedness, Athleticism, and Time to Position Under a Paired Sight Trial

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ABSTRACT

Proprioception is defined as the process of taking in and analyzing information about the position of the body. Proprioception can be tested by excluding the visual sense and performing arm movements in a repetitive manner. An arm kinesthesiometer, used to test proprioception, is a device that measures the angle of movement around a joint in 1 degree increments and allows both active and passive movement. **PURPOSE**: The purpose of the study was to determine whether sighted individuals perform better than those with occluded sight (blindfolded) due to proprioceptive awareness. **METHODS**: For 1 week, 92 student subjects from a South Texas university population participated in arm motor tasks. Subjects were randomly assigned to two groups (n = 46/group): A (blindfolded Session 1) and B (blindfolded Session 2). On day 1, instructions were given on how to use and perform proper movement on a kinesthesiometer. Subjects sat in a chair with their feet flat on the floor, their arm resting on the device, their elbow at the corner, and their middle finger pointing to zero. Subjects performed three timed trials with both preferred and non-preferred hands, moving their arm from 90 degrees (extended straight away from body) towards their body horizontally to exactly 30 degrees. Time to position and constant error (+/-) were recorded for each trial. On day 2, a week later, subjects completed the same trials as day 1, but the conditions reversed so that Group A was now sighted and Group B was blindfolded. **RESULTS**: Considering only handedness in the subjects with a paired-samples t-test, the average change in time to position from Session 1 to Session 2, with the subjects using their non-preferred hand in both sessions, was significantly ($p$=0.002) faster in the second session by 200.145 msec. In the use of their preferred hand, average change in time to position from Session 1 to Session 2, with the subjects was significantly ($p$=0.000) faster in the second session by 286.250 msec. When comparing the subjects on sighted to occluded sight with an independent t-test, only Group B (blindfolded Session 2), demonstrated a significant difference in the average change in time to position, specifically in the non-preferred hand ($p$=0.017) at the speed of 309.198 msec. faster in the second session. Additionally, there were no significant differences seen between session 1 and 2 or Group A and B in regards to speed (msec.) and constant error for sighted or occluded sight subjects or handedness.-**CONCLUSION**: The present study confirms the overall trend that on average sighted subjects typically perform with better accuracy and faster speeds than those with occluded sight. However, when considering the issue of handedness, there does seem to be a learning curve that may not achieve more accuracy in the short time allowed for the subjects, but may have a quicker average change in time to position. While this is across all groups, it seems that this phenomenon in this study is enough to overcome the occluded sight in the second session by Group B in their non-preferred hand. Further research should be performed to note if learning behavior in a non-preferred hand may be higher since it is often less practiced in speed/accuracy movement, and therefore, may have a higher level of trainability.