performed in a random order. PFC activity was monitored during all phases using 16-channel functional near-infrared spectroscopy, an optical imaging technology which measures changes in cortical hemoglobin concentration associated with neural activity. Dependent measures included relative changes in the mean oxygenated hemoglobin (HbO2), deoxygenated hemoglobin (Hb), and oxygenation (Oxy = HbO2 - Hb). Our findings of practice order by task interactions during acquisition and retention supports King et al.'s (2005) work in which they reported a decrease in prefrontal activity during context-dependent memory and posited that Broadmann's area 10 "is the prefrontal region most involved in dealing with contextual interference (p. 264)". Decreased activation patterns of mean HbO2 for BLK and RAN practice across retention trials indicated reduced activity in the PFC. This finding is expected as there is less activity of the PFC during the later stages of learning (Shadmehr & Holcomb, 1997). During transfer BLK had more Oxy than RAN indicating increased effort. Discussion focuses on the roles of cognitive processing and PFC metabolic neural activity during the learning of multiple tasks with different practice orders. Funding for this work was provided by the Pennsylvania Dept of Health Tobacco Formula Funds.

The effect of goalkeepers adopting Müller-Lyer postures

Shim, Jaeho, Baylor University; Rich S.W. Masters, The University of Hong Kong; Jamie M. Poolton, The University of Hong Kong; John van der Kamp, VU University

The posture that a goalkeeper assumes can influence perceptions of his or her size and the motor behavior of an opponent. Van der Kamp & Masters (2008) showed that postures that mimicked an amputated Müller-Lyer illusion in a wings-out/arms-up configuration resulted in larger estimates of goalkeeper height than a wings-in/arms-down configuration. Furthermore, when participants threw to score in a handball goal, the shots were placed further from the arms-up goalkeeper, presumably because he was thought capable of covering a greater area of the goal. We aimed to verify that throwing behaviour was related to (mis-)perceptions of goalkeeper height and, by association, goalkeeper reach. A 1.9 m animated representation of a goalkeeper was projected onto a blank screen. The goalkeeper was shown in an arms-up (45 degrees above horizontal), arms-out (horizontal), or arms-down (45 degrees below horizontal) posture. The 3 postures were each shown 10 times in a random order. For each presentation 34 participants made two estimates of the goalkeeper's maximum static reach, which was defined as the position of middle finger of the goalkeeper in the arms-out posture. Estimates were made by aiming a laser pointer and throwing a ball. The horizontal displacements of the aiming and throwing estimates from the actual position of middle finger (75 cm from the midline of the body) were measured. For the horizontal displacement measure, there was no significant difference between aiming and throwing estimates ($p > .05$), but a significant effect of posture, $F(2, 66) = 10.1$, $p < .01$. Participants perceived the hand closer to the midline of the body in the arms-down posture (67.4 cm) than the arms-up posture (75.2 cm). The findings corroborate previous work in suggesting that the goalkeeper can influence perceptions of his maximum reach and the motor behaviour of an opponent by adopting illusory postures. Further investigations need to address whether the effects are also mediated by hand position or perceptions of arm length rather than body height.

Nonlinear time series analyses of seated postural control in young adults with spinal cord injury

Shin, Sunghoon, UIUC; Jacob J. Sosnoff, UIUC