body and hip bone mineral density (BMD) were determined by
dual-energy X-ray absorptiometry (DXA). Results: As expected,
men were taller, heavier, with greater lean mass and
less fat mass, higher BMD and muscle strength, and bet-
ter lower extremity function then women (p < 0.05), although
there was no difference between men and women for physical
activity level, number of medications or falls. 400MWT was
significantly better (p < 0.001) in men (233 s) than women
(263 s). In women, those with better 400MWT had greater
leg strength (r = 0.336, p < 0.05) and better physical function
(r = 0.291–0.610, p < 0.05), except for the backwards
walk. In men, 400MWT was related to all measures of lower
extremity function (r = 0.408–0.638, p < 0.01) but not muscle
strength. In addition, those with greater fat mass or % fat were
slower (p < 0.05). These associations were not substantially
altered after controlling for age, body size or physical activity.
Conclusions: 400MWT is significantly associated with sev-
eral standard measures of lower extremity function, albeit
of a generally moderate nature, and are consistent across
gender.

doi:10.1016/j.jsams.2010.10.649

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Ball and goal location as constraints on decision making
in team sports
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Analysis of pattern forming dynamics in team sports can reveal potential collective variables that capture preferred coordination modes and interactions between players. Interpersonal interactions can be considered as in-phase (0°), corresponding to symmetrical relations between agents, or anti-phase (~180° or 180°), corresponding to anti-symmetrical relations (Kelso & Engstrom, 2006). We investigated how behaviour of attacker–defender dyads in futsal was constrained by the ball and goal location. We identified phase relations and transitions in dyads when a goal was scored. Ten futsal games in the 2009 Lusophony Games in Lisbon were digitally recorded (25 Hz). 30 sequences of play with a goal scored were analysed. Sequences were digitized with TACTO software, filtered by a low pass filter (6 Hz) (Fernandes et al., 2007). From x and y coordinate data on spatial locations of attackers and defenders and the ball, we computed distances between all defenders and all attackers. We computed distance of each dyad agent to the ball and centre of the goal and calculated angles between dyad agents and the goal centre. As an order parameter, using a Hilbert transform, we computed relative phase values for three pairs of variables: (i) distance of attacker and defender to the ball, (ii) distance of attacker and defender to the goal, and (iii) angle of the attacker and defender and the goal. Agents in each dyad coordinated their relative distances to the goal, revealing an attractor in in-phase mode. Both system agents coordinated their relative angle with the goal in an in-phase mode, illustrating how the defender tried to maintain a line between the goal and attacker. As distance to goal decreased, higher levels of dyadic system variability emerged. Analysis of distance of each dyadic agent to the ball revealed interpersonal interactions to acquire a stable in-phase mode of coordination. Data suggested that both ball and goal location constrained dyadic agent behaviour, although the latter established a higher level of constraint on attacker and defender interactions.

doi:10.1016/j.jsams.2010.10.650

Improving proprioception through the use of Tai Chi
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Introduction: Proprioception is a skill which can be improved through specific motor skill activities. Based on its autonomic response, it is often overlooked for improving this early evolutionary sense until an injury occurs, based on reduced proprioceptive stimuli. Purpose: The purpose of this study was to determine if a 14 week Tai Chi course could improve proprioceptive stability scores in college-aged students. Methods: A one group pre-test/post-test design (n = 42) was selected for the study. All subjects were assessed pre- and post-stability scores via computerized posturography (Bertec Inc., Columbus, OH) to determine Center of Pressure (CoP) balance scores on a perturbed surface with their eyes opened and eyes closed. The group practiced three times a week for 45 min, during 14 consecutive weeks. A dependent t-test (p < .05) was selected to determine any significance with pre- and post-test scores with eyes open and eyes closed CoP balance. Results: The group did show significant improvement in CoP balance scores on a perturbed surface with the eyes open (.004 sd+.18) after 14 weeks of training. The same group also showed significant improvement in CoP scores with their eyes closed (.007 sd+.25) on a perturbed surface. Conclusion: This study has demonstrated that performing Tai Chi three times per week for 45 min can be effective towards improving proprioceptive scores in college-aged students. A recommendation would be to assess other styles of Tai Chito see if they also improve proprioceptive balance