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## Full-length peer reviewed articles

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### Leg Dexterity

1. Inge Werner, Francisco J. Valero-Cuevas and Peter Federolf [Mountain Hiking: Prolonged Eccentric Muscle Contraction during Simulated Downhill Walking Perturbs Sensorimotor Control Loops Needed for Safe Dynamic Foot–Ground Interactions](#) *International Journal of Environmental Research and Public Health*, 2023
2. Lawrence EL, Peppoloni L, Valero-Cuevas FJ [Sex differences in leg dexterity are not present in elite athletes](#) *Journal of Biomechanics*, 2017
3. Nagamori A, Valero-Cuevas FJ, Finley JM. [Unilateral Eccentric Contraction of the Plantarflexors Leads to Bilateral Alterations in Leg Dexterity](#). *Frontiers in Physiology*, 2016
4. Lawrence EL, Cesar GM, Bromfield M, Peterson R, Valero-Cuevas FJ, Sigward SM. [Strength, multi-joint coordination, and sensorimotor processing are independent contributors to overall balance ability](#). *BioMed research international*, 2015
5. Krenn O, Werner I, Lawrence EL, Valero-Cuevas FJ. [The lower extremity dexterity test quantifies sensorimotor control for cross country skiing](#). *Science in Skiing VI*, 2015
6. Peppoloni L, Lawrence EL, Ruffaldi E, Valero-Cuevas FJ. [Characterization of the Disruption of Neural Control Strategies for Dynamic Fingertip Forces from Attractor Reconstruction](#). *PLoS ONE*, 12(2), 2017
7. Reyes A, Laine CM, Kutch JJ, Valero-Cuevas FJ. [Beta Band Corticomuscular Drive Reflects Muscle Coordination Strategies](#). *Frontiers in Computational Neuroscience*, 11, 2017
8. Krenn O, Werner I, Lawrence EL, Valero-Cuevas FJ. [The lower extremity dexterity test quantifies sensorimotor control for cross country skiing](#). *Science in Skiing VI*, 2015
9. Lawrence EL, Fassola I, Werner I, Leclercq C, Valero-Cuevas FJ. [Quantification of dexterity as the dynamical regulation of instabilities: comparisons across gender, age, and disease](#) *Frontiers in neurology*, 2014
10. Lyle MA, Valero-Cuevas FJ, Gregor RJ, Powers CM. [Lower extremity dexterity is associated with agility in adolescent soccer athletes](#) *Scandinavian journal of medicine & science in sports*, 2013
11. Lyle MA, Valero-Cuevas FJ, Gregor RJ, Powers CM. [Control of Dynamic Foot-ground Interactions in Male and Female Soccer Athletes: Females Exhibit Reduced Dexterity and Higher Limb Stiffness During Landing](#) *Journal of biomechanics*, 2013

12. Lyle MA, Valero-Cuevas FJ, Gregor RJ, Powers CM. [The lower extremity dexterity test as a measure of lower extremity dynamical capability](#) *Journal of biomechanics*, 2013
13. Rowley, K. Michael, Jo Armour Smith, and Kornelia Kulig. "Reduced trunk coupling in persons with recurrent low back pain is associated with greater deep-to-superficial trunk muscle activation ratios during the balance-dexterity task." *journal of orthopaedic & sports physical therapy* 49.12 (2019): 887-898.
14. Shih, Hai-Jung Steffi, et al. "Trunk control in and out of an episode of recurrent low back pain in young adults during the Balance-Dexterity Task." *Journal of Electromyography and Kinesiology* (2023): 102794.
15. Rowley, K. Michael, Tilman Engel, and Kornelia Kulig. "Trunk and hip muscle activity during the Balance-Dexterity task in persons with and without recurrent low back pain." *Journal of Electromyography and Kinesiology* 50 (2020): 102378.
16. Rowley, K. Michael, Carolee J. Winstein, and Kornelia Kulig. "Persons in remission from recurrent low back pain alter trunk coupling under dual-task interference during a dynamic balance task." *Experimental Brain Research* 238 (2020): 957-968.

## Hand Dexterity

17. Ko N, Laine CM, Fisher BE, Valero-Cuevas FJ. [Force variability during dexterous manipulation in individuals with mild to moderate Parkinson's disease.](#) *Frontiers in aging neuroscience*, 2015
18. Lawrence EL, Dayanidhi S, Fassola I, Requejo P, Leclercq C, Winstein CW, Valero-Cuevas FJ. [Outcome measures for hand function naturally reveal three latent domains in older adults: strength, coordinated upper extremity function, and sensorimotor processing](#) *Frontiers in aging neuroscience*, 2015
19. Pavlova EL, Hedberg A, Ponten E, Gantelius S, Valero-Cuevas FJ, Forssberg H. [Activity in the brain network for dynamic manipulation of unstable objects is robust to acute tactile nerve block: an fMRI study](#) *brain research*, 2015
20. Duff SV, Aaron DH, Gogola, GR, Valero-Cuevas FJ. [Innovative evaluation of dexterity in pediatrics](#) *Journal of Hand Therapy*, 2015
21. Lightdale-Miric N, Mueske NM, Lawrence EL, Loiselle J, Berggren J, Dayanidhi S, Stevanovic M, Valero-Cuevas FJ, Wren TAL. [Long Term Functional Outcomes After Early Childhood Pollicization](#) *Journal of Hand Therapy*, 2014
22. Lightdale-Miric N, Mueske NM, Dayanidhi S, Loiselle J, Berggren J, Lawrence EL, Stevanovic M, Valero-Cuevas FJ, Wren TAL. [Quantitative Assessment of Dynamic Control of Fingertip Forces After Pollicization](#) *Gait & posture*, 2014
23. Dayanidhi S and Valero-Cuevas FJ. [Dexterous manipulation is poorer at older ages and is dissociated from decline of hand strength](#) *The Journals of Gerontology Series A: Biological Sciences and Medical Sciences*, 2014
24. Dayanidhi S, Hedberg âsa, Valero-Cuevas FJ, Forssberg H. [The developmental improvements in dynamic control of fingertip forces last throughout childhood and into adolescence](#) *Journal of neurophysiology*, 2013
25. Dayanidhi S, Kutch JJ, Valero-Cuevas FJ. [Decrease in muscle contraction time complements neural maturation in the development of dynamic manipulation](#)

26. Holmström L, de Manzano A, Vollmer B, Forsman L, Valero-Cuevas FJ, Ullen F, and Forssberg H [Dissociation of brain areas associated with force production and stabilization during manipulation of unstable objects](#). *Experimental brain research*, 2011
27. Kristine Mosier, Chad Lau, Yang Wang, Madhusudhan Venkadesan, Francisco J. Valero-Cuevas [Controlling instabilities in manipulation requires specific cortical-striatal-cerebellar networks](#). *Journal of neurophysiology*, 2011
28. Vollmer B, Holmström L, Forsman L, Valero-Cuevas FJ, Forssberg H and Ullen F. [Evidence of validity in a new method for measurement of dexterity in children and adolescents](#). *Developmental Medicine & Child Neurology*, 2010
29. Venkadesan M, Guckenheimer J, Valero-Cuevas FJ. [Manipulating the edge of instability](#). *Journal of biomechanics*, 2007
30. Talati A, Valero-Cuevas FJ, Hirsch J. [Visual and Tactile Guidance of Dexterous Manipulation Tasks: an fMRI Study](#). *Perceptual and motor skills*, 2005
31. Valero-Cuevas FJ. [An integrative approach to the biomechanical function and neuromuscular control of the fingers](#). *Journal of biomechanics*, 2005
32. Valero-Cuevas FJ, Smaby N, Venkadesan M, Peterson M and Wright T. [The strength-dexterity test as a measure of dynamic pinch performance](#). *Journal of biomechanics*, 2003
33. Johanson ME, Valero-Cuevas FJ and Hentz VR. [Activation patterns of the thumb muscles during stable and unstable pinch tasks](#). *The Journal of hand surgery*, 2001