NING ZIHENG

ASPECTOS CINESIOLÓGICOS DA TRANSFERÊNCIA BILATERAL NA APRENDIZAGEM DO LANÇAMENTO POR CIMA

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TABLE OF CONTENTS

CHAPTER III: METHODOLOGY

CHAPTER IV: RESULTS

CHAPTER V: DISCUSSIONS

CHAPTER VI: CONCLUSIONS Page

Aspectos Cinesiológicos da transferência bilateral na Aprendizagem do Lançamento por cima (Resumo)

Introdução

Investigações tem demonstrado que a transferência do treino ocorre entre membros. Muita desta literatura da transferência bilateral com foco na tradição e em geral tarefas simples de aprendizagem motora, tais como: persuit rotor ou sequência de dedos. Escassa investigação foi realizada sobre, o que se deu o nome de transferência bilateral na aprendizagem na habilidade da motricidade grosseira. Os objectivos perseguidos por estes estudos foram; a). avaliar eficácia da transferência bilateral na aprendizagem de lançamento pela medição e selecção das variáveis biomecânicas da **"performace"**; b). Estudar a assimetria da transferência bilateral na aprendizagem do lançamento por cima; c). Investigar as mudanças no modelo do movimento dos braços e tronco na aprendizagem do lançamento em termos cinemáticos e cinéticos, durante o processo de transferência bilateral.

Revisão da Literatura

O fenómeno de tranferência bilateral tem sido estudado por mais de 100 anos. Um número de estudos tem mostrado que a transferência bilateral existe um paradigma de aprendizagem de várias tarefas, ambos factores cognitivos e neuromusculares foram assumidos como determinantes na ocorrência de transferência bilateral. A assimetria da transferência bilateral foi elucidada por diferentes modelos de suposições apesar do facto que houve uma controvérsia na direção da transferência bilateral da aprendizagem motora.

Metodologia

Os métodos e aspectos processuais utilizados neste estudo incluiam a condições de um estudo piloto, selecção de indivíduos, tarefa de aprendizagem, aparelhos de medição, grupos escolhidos, procedimento de prática, protocolo de teste e análises estatísticas. Este estudo incide principalmente na análise cinemática e cinética dos membros bilaterais dos individuos no processo de aprendizagem do lançamento por cima. 53 alunos da Escola Primária do sexo masculino, destros participaram deste estudo com consentimento. Os individuos foram divididos em 4 grupos. Destros, sinistros, ambi-destros e grupo de controlo de acordo com um esquema praticado. A tarefa experimental foi fazer um movimento de lançamento de pé para prcisão com uma bola de tênis (50 –55 gr; diam 6,4 – 6,7 cm) como objecto de lançamento para o centro do alvo. Sistema de análise de movimento em 3 dimensões (Santa Rosa, CA) e Kistler Force Platform System (9287 A) foram usadas para registar os dados e para avaliar a transferência ocorrida entre as mãos. A medição da trasnferência bilateral inclui da mão preferida para a mão não preferida (TPN) e a transferência da mão não preferida para a preferida de acordo com o padrão do próprio indivíduo (MaGill, 1998). A séries de métodos estatísticos (Chi – square X^2 Analysis, Pearson`s Product Correlation, Paired t-test, Analysis of Variance, Multivariate Analysis of Variance, Multivariate Analysis with RM) foram feitas para o tratamento de dados.

Resultados

Foi registado que os sujeitos dos 4 grupos tinham o mesmo nível no que respeita ao erro radial (RE), erro constante (CE), erro variante (VE), de ambos lançadores destros e sinistros antes da condução da experiência. Os resultados também demostraram que não há diferença significativa em toda as variáveis de velocidade e aceleração bem como cinéticas em ambos os braços direitos e esquerdos entre os 4 grupos ($P>0.05$). Os resultados do pós-teste indicaram que os erros radias em ambos os lançamentos com a mão direita e esquerda foram geralmente melhorados nos 4 grupos. Entretanto, a velocidade máxima e aceleração máxima da bola nos lançamentos por cima nos 4 grupos foram aumentados devido a aprendizagem e prática dos lançamentos por cima. Resultados similares foram encontrados no que diz respeito as medidas cinéticas.

Discussão

A assimetria manual foi mostrada no lançamento por cima com o facto que diferenças significativas ($P<0,05$) existiram num amplo leque de variáveis entre a mais preferida e não preferida. A mão preferida suplantou a não preferida no que respeita a precisão e velocidade do lançamento por cima. Os resultados indicaram que a prática alternada com os dois membros é um esquema de prática óptimo, para a execução da tarefa bilateral, relativamente prática de tarefa com a mão preferencial ou não preferencial. Os resultados da experiência não estão de acordo com a lei "FITTS" na qual a relação entre a velocidade e a precisão de movimento de objectivos simples foi elucidada como uma troca de velocidade – precisão. A quantiadade de transferência bilateral (a transferência preferida para a não preferida); na aprendizagem do lançamento por cima foi avaliada no que respeita a medida cinesiológica. As hipóteses da pesquisa, em que houve melhoria no que diz respeito aos erros de **"performace"**, cinemáticas e cinéticas medidas do lançamento por cima do outro braço (destreinado) depois da prática do lançamento por cima com um braço do pré-teste para o pós-teste, foram registados neste estudo.

Conclusões

a) Esquemas de prática alternativa é o mais eficiente no que diz respeito a melhora de toda **"performace"**do lançamento por cima. Isto sugere que o esquema alternativo deve ser empregue na aprendizagem das tarefas motoras bilaterais de forma a optimizar o processo de aprendizagem.

b) Transferência bilateral ocorre na aprendizagem do lançamento por cima. As assimetrias da transferência bilateral do lançamento por cima parecem ser um tanto paradoxais. Relativamente aos erros de **"performace"** a transferência do membro não preferido para o preferido é maior do que o contrário, relativamente a velocidade e a aceleração a transferência do membro preferencial é maior do que o contrário. O novo " Motor – Perceptual Model", foi desenvolvido para elucidar a direcção comum das assimetrias da transferência bilateral. A direção na assimetria da trasferência bilateral parece ser determinada pelas medidas do domíneo cognitivo ou pelas medidas do domíneo neuromuscular. Para que a transferência das medidas do domíneo cognitivo assim como erros de **performace"**manifestam-se mais da transferência da não preferida para a preferida, enquanto maior transferência da preferida para não preferida se relaciona as medidas do domíneo neuromuscular, tais como medidas cinemáticas e cinéticas no que respeita a direção da transferência bilateral entre as mãos direita e esquerda.

REFERENCE

1. Aboitiz, F. (1992) Brain connections: inter-hemispheric fiber systems and anatomical brain asymmetries in humans. Biology Research, 25, P51-61.

2. Adams, J. A. (1987) Historical review and appraisal of research on learning, retention, and transfer of human motor skills. Psychological Bulletin, 101, P41-74.

3. Adams, J. A. (1990) The changing face of motor learning. Human Movement Science, 9, P209-220.

4. Adams, D. (1996) The relative effectiveness of three instructional strategies on the learning of an overarm throw for force. Microform Publications, International Institute for Sport & Human Performance, University of Oregon, Eugene, Ore, 2 microfiches (156 frames.): negative, ill; 11x15 cm.

5. Adam, J. J. (1992) The effects of objectives and constraints on motor control strategy in reciprocal aiming movements. Journal of Motor Behavior, 24, P173-185.

6. Aggleton, J. P. & Wood, C. J. (1990) Is there a left-handed advantage in <ballistic> sports? International Journal of Sport Psychology, 21, P46-57.

7. Ammons, R. B. & Ammons, C. H. (1951) Bilateral transfer of rotary pursuit skill. American Psychologist, 6, P294-301.

8. Ammons, R. B. (1955) Rotary pursuit performance as related to sex and age of pre-adult subjects. Journal of Experimental Psychology, 49, P127-133.

9. Ammons, R. B. (1958) Le Movement. In G.H. Steward and J.P. Steward (Eds.): Current Psychological Issues. New York: Holt, Rinehart & Winston. P146-183.

10. Annett, J. Annett, M., Hudson, P.T.W. & Turner, A. (1979) The control of movement in the preferred and non-preferred hands. Quarterly Journal of Experimental Psychology, 31, P641-652.

11. Anson, J. G. & Bird, Y. N. (1993) Neuromotor programming: Bilateral and unilateral effects on simple reaction time. Human Movement Science, 12, P37-50.

12. Armitage, M. & Larkin, D. (1993) Laterality, motor asymmetry and clumsiness in children. Human Movement Science, 12, P155-177.

13. Arnold, M. B. (1946) On the mechanism of suggestion and hypnosis. Journal of Abnormal Psychology, 41, P107-128.

14. Atwater, A. E. (1971) Movement characteristics of the overarm throw: A kinematic analysis of men and women performers. Dissertation Abstracts International, 31, 5819.

15. Atwater, A. E. (1979) Biomechanics of overarm throwing movements and of throwing injuries. Exercise and Sport Science Review, 7, P43-85.

16. Bandura, A., Jeffery, R. & Bachicha, D. L. (1974) Analysis of memory codes and cumulative rehearsal in observational learning. Journal of Research in Personality, 17, P295-305.

17. Barfield, W. R. (1995) Effects of Selected Kinematic and Kinetic Variables on Instep Kicking With Dominant and Nondominant Limbs. Journal of Human Movement Studies, 29, P251-272.

18. Barrentine, S. W., Matsuo, T., Escamilla, R. F., Fleisig, G. S. and Andrews, J. R. (1998) Kinematic analysis of the wrist and forearm during baseball pitching. Journal of Applied Biomechanics, 14, P24-39.

19. Berlin, D. F. (1987) Inter-hemispheric Transfer of Tactile Information by Learning Disabled Children. Paper presented at the Annual Conference of the American Educational Research Association (Washington, DC, April 20-24, 1987).

20. Bisiacchi, P., Marzi, C. A., Nicoletti, R., Carena, G., Mucignat, C. & Tomaiuolo, F. (1994) Left-right asymmetry of callosal transfer in normal human subjects. Behavior Brain Research, 64, P173-178.

21. Blerkom, M. L. V. (1985) Developmental Trends in Dichotic Lateralization. Perceptual and Motor Skill, 60, P951-959.

22. Borod, J. C. (1992) Inter-hemispheric and Intra-hemispheric Control of Emotion: A Focus on Unilateral Brain Damage. Journal of Consulting and Clinical Psychology, 60, P339-348.

23. Bow, W. J. (1975) the relative effectiveness of two styles of baseball pitching in the development of speed and accuracy of young pitchers. Completed Reseach in Physical Health Education and Recreation, 17, P50.

24. Briggs, G. E. & Brogden, W. J. (1953) Bilateral aspects of the trigonometric relationship of precision and angle of linear pursuit-movements. American Journal of Psychology, 66, 472-478.

25. Brizzolara, D., Ferretti, G. Brovedan, P., Casalini, C. & Saran, B. (1994) Is inter-hemispheric transfer time related to age? A developmental study. Behavior Brain Research, 64, 179-184.

26. Bryant, W. L. (1892) On the development of voluntary motor ability. American Journal of Psychology, 5, P123-204.

27. Byblow, W. D., Carson, R. G. & Goodman, D. (1994) Expressions of asymmetries and anchoring in bimanual coordination. Human Movement Science, 13, P3-28.

28. Byrd, R. & Gibson, M. (1986) Bilateral transfer across ages 7 to 17 years. Perceptual and Motor Skills, 62, P87-90.

29. Byrd, R. (1988) Bilateral transfer in mentally retarded children of ages 7 to 17 years. Perceptual and Motor Skill, 66, P115-119.

30. Carson, R. G. (1989) Manual asymmetries: feedback processing, output variability, and spatial complexity: resolving some inconsistencies. Journal of Motor Behavior, 21, P38-47.

31. Carson, R. G. (1993a) Manual Asymmetries: Old problems and new directions. Human Movement Science, 12, P479-506.

32. Carson, R. G., Goodman, D., Elliott, D. & Chua, R. (1993b) Asymmetries in the regulation of visually guided aiming. Journal of Motor Behavior, 25, P21-32.

33. Carson, R. G., Elliott, D., Goodman, D., Thyer, L., Chua, R. & Roy, E. A. (1993c) The role of impulse-variability in manual aiming asymmetries. Psychological Research, 55, P291-298.

34. Carson, R. G., Goodman, D., Kelso, J. A. S. & Elliott, D. (1994) Intentional switching between patterns of interlimb coordination. Journal of Human Movement Studies, 27, P201-218.

35. Carson, R. G., Chua, R., Goodman, D., Byblow, W. D. & Elliott, D. (1995) The preparation of aiming movements. Brain and Cognition, 28, P133-154.

36. Carson, R. G. (1996): Putative right hemisphere contributions to the preparation of reaching and aiming movement. In Elliott D. & Roy E. A.(Eds.): Manual asymmetries. Boca Raton, FL: CRC Press, P159-169.

37. Carson, R. G., Byblow, W. D., Abernethy, B. & Summers, J. J. (1996) The contribution of inherent and incidental constraints to intentional switching between patterns of bimanual coordination. Human Movement Science, 15, P565-589.

38. Carson, R. G., Thomas, J., Summers, J. J., Walters, M. R. & Semjen, A. (1997) The dynamics of bimanual circle drawing. The Quarterly Journal of Experimental Psychology, 50, P1-19.

39. Chamberlin, C. & Lee, T. (1993) Handbook of research on sport psychology: Arranging practice conditions and designing instruction. In Singer, R. B., Murphey, M. & Tennant, L. K. (Eds.), Macmillan Publishing Company, New York, P213-237.

40. Clarke, J. M. & Zaidel, E. (1994) Anatomical-behavioral relationships: corpus callosum morphometry and hemispheric specialization. Behavior Brain Research, 64, P185-202.

41. Clymer, P. E. & Silva, P. A. (1985) Laterality, cognitive ability and motor performance in a sample of seven year olds. Journal of Human Movement Studies, 11, P59-68.

42. Cook, T. W. (1936) Studies in cross-education. Theoretical Psychological Review, 43, P149-178.

43. Cooper, J. M., Adrian, M. and Glassow, R. A. (1982) Kinesiology. 5th ed., Mosby, St. Louis.

44. Daniel, R. S. (1941) An action potential study of bilateral transfer. Psychological Bulletin, 38.

45. David, A. S. (1994) Schizophrenia and the corpus callosum: developmental, structural and functional relationships. Behavior Brain Research, 64, P203-211.

46. Davis, R. C. (1942) The pattern of muscular action in simple voluntary movement. Journal of Experimental Psychology, 31, P437-466.

47. Demonet, J. F., Chollet, F., Ramsay, S., Cardebat, D., Nespoulous, J. L., Wise, R., Rascol, A., & Frackowiak, R. (1992) The anatomy of phonological and semantic processing in normal subjects. Brain. 115, P1753-1768.

48. Diamond, S. (1970) Cerebral dominance or lateral preference in motor control. Acta psychology, 32.

49. Dunham, P. J. (1977a) Effect of practice order on the efficiency of bilateral skill acquisition. Research Quarterly, 48, P284-287.

50. Dunham, P. J. (1977b) Effect of bilateral transfer on coincidence/anticipation performance. Research Quarterly, 48, P51-55.

51. Dunham, P. J. (1978) Retention of bilateral performance as a function of practice order. Perceptual and Motor Skills, 46, P43-46.

52. Eason, B. L. & Surburg, P. R. (1993) Effects of midline crossing on reaction time and movement time with adolescents classified as mildly mentally retarded. Adapted Physical Activity Quarterly , 10, P269-280.

53. Edwards, J. M. & Elliott, D. (1987) The effect of unimanual training on contralateral motor overflow in children and adults. Developmental Neuropsychology, 3, P229.

54. Edwards, J. M. & Elliott, D. (1989) Asymmetries in intermanual transfer of training and motor overflow in adults with Down's syndrome and nonhandicapped children. Journal of Clinical and Experimental Neuropsychology, 11, P959-966.

55. Ekern, S. R. (1969) An analysis of selected measures of the overarm throwing patterns of elementary school boys and girls. Ph.D. Dissertation, University of Wisconsin.

56. Elliot, B. & Anderson, G. (1990) Age related differences in high performance overarm throwing patterns. Journal of Human Movement Studies, 18, P1-24.

57. Elliott, D. (1985) Manual asymmetries in the performance of sequential movement by adolescents and adults with Down's syndrome. American Journal of Mental Deficiency, 90, P90-97.

58. Elliott, D., Weeks, D. J., Lindley, S., & Jones, R. (1986a) Sex differences in dual-task interference between speaking and a manual force-production task. Perceptual and Motor Skills. 62, P3-8.

59. Elliott, D., Weeks, D. J. & Jones, R. (1986b) Lateral Asymmetries in Finger-Tapping by Adolescents and Young Adults With Down Syndrome. American Journal of Mental Deficiency. 90, P472-475.

60. Elliott, D., Edwards, J. M., Weeks, D. J., Lindley, S., & Carnahan, H. (1987a) Cerebral specialization in young adults with Down's syndrome. American Journal of Mental Deficiency. 91, P480-485.

61. Elliott, D., Weeks, D. J., & Elliott, C. L. (1987b) Cerebral specialization in individuals with Down's syndrome. American Journal of Mental Retardation, 92, P263-271.

62. Elliott, D., Roy, E. A., Goodman, D., Carson, R. G., Chuan, R. & Maraj, B. K. V. (1993) Asymmetries in the preparation and control of manual aiming movements. Canadian Journal of Experimental Psychology, 47, P570-589.

63. Elliott, D., Lyons, J., Chua, R., Goodman, D. & Carson, R. G. (1995) The influence of target perturbation on manual aiming asymmetries in right handers. Cortex, 31, P685-697.

64. Elliott, D., Lyons, J. & Kerry D. (1997) Rescaling an acquired discrete aiming movement: Specific or general motor learning? Human Movement Science, 16, P81-96.

65. Elliott, D. & Chua, R. (1996). Manual asymmetries in goal-directed movement. In Elliott, D. & Roy E. A.(Eds.): Manual asymmetries. Boca Raton, FL: CRC Press. P143-158.

66. Ellis, H. C. (1965) Transfer of learning. The Macmillan company, New York, P38.

67. Enoka, R. M. & Fuglevand, A. J. (1993) Neuromuscular Basis of the Maximum Voluntary Force Capacity of Muscle. In Grabiner, M. D. (Eds.): Current Issues in Biomechanics, Human Kinetics Publishers, Champaign, P215-229.

68. Escamilla, R. F., Fleisig, G. S., Barrentine, S. W., Zheng, N. & Andrews, J. R. (1998) Kinematic comparisons of throwing different types of baseball pitches. Journal of Applied Biomechanics, 14, P1-23.

69. Ewert, P. H. (1926) Bilateral transfer in mirror-drawing. Journal of Genetic Psychology, 33, P235-249.

70. Fairweather, M. M. & Sidaway, B. (1994) Hemispheric teaching strategies in the acquisition and retention of a motor skill. Research Quarterly for Exercise and Sport, 65, P40-47.

71. Fetz, F. & Jaeger, B. (1995) Development of throwing accuracy. Sportonomics, Muenchen, 1, P17-26.

72. Fisk, J. D. & Goodale, M. A. (1989). The effects of instructions to subjects on programming of visually directed reaching movement. Journal of Motor Behavior, 21(1), P5-19.

73. Fitts, P. M. (1954) The information of the human motor system in controlling the amplitude of movement. Journal of Experimental Psychology, 47, P381-391.

74. Fitts, P. M. & Peterson, J. R. (1964) Information capacity of discrete motor responses. Journal of Experimental Psychology, 67, P 103-112.

75. Fleisig, G. S., Barrentine, S. W., Escamilla, R. F. & Andrews, J. R. (1996) Biomechanics of overhand throwing with implications for injuries. Sports Medicine (Auckland, N. Z.), 21, P421-437.

76. Fleisig, G. S., Escamilla, R. F., Andrews, J. R. Matsuo, T. Satterwhite, Y. & Barrentine, S. W. (1996) Kinematic and kinetic comparison between baseball pitching and football passing. Journal of Applied Biomechanics, 12, P207-224

77. Flowers K. (1975) Handedness and controlled movement. British Journal of Psychology, 66, P39-52.

78. Freeman, G. L. (1938a) Studies in the psycho-physiology of transfer: II. The relation of bilateral "fatigue" effects of periods of work. Journal of Psychology, 5, P281-283.

79. Freeman, G. L. (1938b) Studies in the psycho-physiology of transfer: III. Bilateral practice effects in normal and mirror-writing. Journal of Psychology, 5, P285-289.

80. Furubayashi, T. & Kasai, T. (1990) Influence of initial forearm position on premotor times (PMTs) of the biceps brachii during an elbow flexion task. Human Movement Science, 9, P583-598.

81. Friston, K.J, Frith, C.D., Passingham, R.E., Liddle, P.F., & Frackowiak, R.S.J. (1992) Motor practice and neurophysiological adaptation in the cerebellum: A positron tomography study. Proc. R. Soc. Lond. 248: P223-228.

82. Gabriele, T. E., Hall, C. R., & Lee, T. D. (1989) Cognition in motor learning: Imagery effects on contextual interference. Human Movement Science, 8, P227-245.

83. Geffen, G. M., Jones, D. L. & Geffen, L. B. (1993) (in press) Interhemispheric control of manual motor activity. Behavioural brain Research.

84. Glencross, D. J. (1992) Human Skill and Motor Learning: A Critical Review. Sport Science Review. 1, P65-78.

85. Glencross, D. J. (1993) Handbook of research on sport psychology: Human skills: ideas, concepts and models. In Singer, R. B., Murphey, M. & Tennant, L. K. (Eds.), Macmillan Publishing Company, New York, P242-253.

86. Gottlieb, G. L. (1993) A computational model of the simplest motor program. Journal of Motor Behavior, 25, P153-161.

87. Gowan, I. D., Jobe, F. W., Tibone, J. E., Perry, J. & Moynes, R. (1984) A comparative electromyographic analysis of the shoulder during pitching. The American Journal of Sports Medicine, 15, P586-590.

88. Grafton, S. T., Mazziotta, J. C., Presty, S., Friston, K .J., Frackowiak, R. S., Phelps, M. E. (1992) Functional anatomy of human procedural learning determined with regional cerebral blood flow and PET. Journal of Neuroscience, 12, P2542-2548.

89. Haier, R. J., Siegel, B. V., MacLachlan, A., Soderling, E., Lottenberg, S. & Buchsbaum, M. (1991) Regional glucose metabolic changes after learning a complex visuo-spatial motor task: a positron emission tomography study. Brain Research,?.

90. Halverson, L. E., & Roberton, M. A. (1979) The effects of instruction on overhand throwing development in children. In K. Newell and G. Roberts (Eds.), Physchology of Motor Behavior and Sport, 1978, P178, Champaign, IL: Human Kinetics

91. Halverson, L. E., Roberton, M. A. & Langendorfer, S. (1982) Development of the overarm throw: Movement and ball velocity changes by seventh grade. Research Quarterly for Exercise and Sport, 53, P198-205.

92. Harriman J. & Castell, L. (1979) Manual asymmetry for tactile discrimination. Perception and Motor Skill, 48, P290.

93. Hart. M. A. (1997) Influence of Practice on Response Selection and Response Implementation Processes Involved in the Response Interference Effect. Unpublished PhD dissertation, University of Northern Iowa, Ceder Falls, Iowa.

94. Hatta, T. & Moriya, K. (1988) Developmental Changes of Hemisphere Collaboration for Tactile Sequential Information. International-Journal-of-Behavioral-Development, 11, P451-65.

95. Haywood, K. M. (1993) Life span motor development. 2nd edition, Champaign, IL: Human Kinetics.

96. Hicks, R. E. (1974) Asymmetry of bilateral transfer. American Journal of Psychology, 87, P667-674.

97. Hicks, R. E. & Kinsbourne, M. (1976) On the genesis of human handedness: A review. Journal of Motor Behavior, 8, P257-266.

98. Hicks, R. E., Frank, J. M. & Kinsbourne, M. (1982) The locus of bimanual skill transfer. Journal of General Psychology, 107, P277-281.

99. Hicks, R. E. (1983) Cognitive and motor components of bilateral transfer. American Journal of psychology, 96, P223-228.

100. Hoffman, S. J. Imwold, C. H. and Koller, J. A. (1983) Accuracy and prediction in throwing: A taxonomic analysis of childrens' performance. Research Quarterly for Exercise and Sport, 54, P33-40.

101. Hoptman, M. J. & Davidson, R. J. (1994) How and why do the two cerebral hemispheres interact? Psychological Bulletin, 116, P195-219. D

102. Howard, D., Patterson, K., Wise, R., Brown, W. D., Friston, K., Weiller, C. & Frackowiak, R. (1992) The cortical localization of the lexicons: positron emission tomography evidence. Brain, 115, P1769-1782.

103. Hoyes, B. P. J. (1994) Effects of skill level, hand laterality and movement direction during visuo-motor processing of female athletes performing manual aiming tasks. Women in Sport and Physical Activity Journal (Fort-Worth, Tex.) 3, P15-33.

104. Huck, S. W. (2000) Reading statistics and research. 3rd edition, Addison Wesley Longman, P356-361.

105. Hussell, I. (1975) A communication on an experimental study of manual bilateral transfer. In Alderson, G. J. K. and Tyldesley, D. A. (Eds.): British proceedings of sports psychology, British Society of Sports Psychology: Federation europeene [sic] de psychologie des sports et des activities [sic] corporelles, P296-301.

106. Ignico, A. A. (1991) Relative effects of speed-accuracy emphasis on kindergarten children's learning of the overarm throw. Journal of the International Council for Health, Physical Education and Recreation, 27, Fall, P12-15.

107. Imamizu, H. & Shimojo, S. (1995) The locus of visual-motor learning at the task or manipulator level: Implications from intermanual transfer. Journal of Experimental Psychology, 21, P719-733.

108. Jaegers, M. H., Peterson, R. F., Dantuma, R., Hillen, B., Geuze, R. & Schellekens, J. (1989) Kinesiologic aspects of motor learning in dart throwing. Journal of Human Movement Studies. 16, P161-171.

109. Jenkins, I. H., Brooks, D. J., Nixon, P. D., Frackowiak, R. S. J., & Passingham, R. E. (1994) Motor sequence learning: a study with positron emission tomography. Journal of Neuroscience, 14, P3775-3790.

110. Jobe, F. W., Tibone, J. E., Perry, J. & Moynes, D. (1983) An EMG analysis of the shoulder in throwing and pitching. The American Journal of Sports Medicine, 11, P3-5.

111. Johnson, C. L. & Persinger, M. A. (1994) The sensed presence may be facilitated by inter-hemispheric intercalation: relative efficacy of the minds eye, hemi-sync tape, and bilateral temporal magnetic field stimulation. Perceptual and Motor Skills, 79, P351-354.

112. Jones, R. L. (1995) A review of existing literature relating to spatial awareness in fast ball team games. International Journal of Physical Education, 3, P10-16.

113. Kaderavek, J. (1992) Hemispheric Object Naming and Inter-hemispheric Transfer Functions in Reading Disordered Subjects. Paper presented at the Annual Convention of the American Speech-Language-Hearing Association (San Antonio, TX, November 20-23, 1992).

114. Kaluzny, P., Palmeri, A. & Wiesendanger, M. (1994) The problem of bimanual coupling: a reaction time study of simple unimanual and bimanual finger responses. Electroencephalogia Clinic Neurophysiology, 93, P450-458.

115. Kauranen, K. & Vanharanta, H. (1996) Influences of aging, gender, and handedness on motor performance of upper and lower extremities. Perceptual and Motor Skill, 82, P515-525.

116. Keele, S. W., Jennings, P., Jones, S., Caulton, D. & Cohen, A. (1995) On the Modularity of Squence Resprensentation. Journal of Motor Behavior, 27, P17-30.

117. Knudson, D. & Morrison, C. (1997) Qualitative analysis of human movement. Human Kinetics Publishers, Champain, Ill, P137-143.

118. Knudson, D. & Morrison, C. (1996) An integrated qualitative analysis of overarm throwing. The Journal of Physical Education, Recreation & Dance, 67(6), P31-36.

119. Koh, T. J., Grabiner, M. D., & Clough, C. A. (1993) Bilateral deficit is larger for step than for ramp isometric contractions. Journal of Applied Physiology, 74, P1200-1205.

120. Kohl, R. M. & Roenker, D. L. (1980) Bilateral transfer as a function of mental imagery. Journal of motor-behavior 12, P197-206.

121. Kohl, R. M. & Roenker, D. L. (1983) Mechanism involvement during skill imagery. Journal of Motor Behavior, 15, P179-190.

122. Kohl, R. M., Fisicaro, S. A. & Erbaugh, S. J. (1993) Motor response variations: peripheral and central sources of error. Journal of Motor Behavior, 25, P67-74.

123. Kreighbaum, E. & Barthels, K. M. (1990) Biomechanics: A qualitative approach for studying human movement, 3rd edition, Minneapolis, MN: Gurgess Publishing Company.

124. Koslow, R. E. (1987) Bilateral flexibility in the upper and lower-extremities as related to age and gender. Journal of Human Movement Studies, 13, P467-472.

125. Kuhn, W. (1993) The effects of a unilateral and bilateral maximal strength training program upon the bilateral strength index. In, Proceedings from the XIIth Congress, IAPESGW, Melbourne, The Association, P12.

126. Kunos, A. (1983) A transzfer hatasa a hajitas tavolsagara 6 eves korban. (Effect of transfer on the throwing performance in age of 6 years.) Testnevelisi Foiskola Koezlemenyei (Budapest), 2, P63-81.

127. Larkin, E. (1989) Movement laterality and its relationship to hemispheric specialization. American Journal of Occupational Therapy, May 43.

128. Lassonde, M., Sauerwein, H. & Lepore, F. (1995) Extent and limits of callosal plasticity: Presence of disconnection symptoms in callosal agenesis. Neuropsychologia, 33, P989-1007.

129. Laszlo, J. I. & Baguley, R. A. (1971) Motor memory and bilateral transfer. Journal of Motor Behavior, 3, P235-240.

130. Laszlo, J. I., Baguley, R. A., & Bairstow, P. J. (1970) Bilateral transfer in tapping skill in the absence of peripheral information. Journal of Motor Behavior, 2, P261-271.

131. Latash, M. (1993) Issues of Variability and Motor Learning. Control of Human Movement. Human Kinetics Publishers. P173-203.

132. Lepore, F. (1975) Mecanismes cerebraux du transfert bilateral. Dans, Vachon, L. (ed.), Actes du 1er Symposium quebecois en performance motrice et comportement humain. P168-174.

133. Lidor, R. (1997) Effectiveness of a structured learning strategy on acquisition of game-related gross motor tasks in school settings. Perceptual and Motor Skill, 84(1), P67-80.

134. Lidor, R. (1996) The effectiveness of the 5-Step Aprroach on learning of a gross motor task in school settings. Proceedings of the 1995 AIESEP World Congress, Netanya (Israel), The Zinman College, The Wingate Institute, 1996, P133-141.

135. Lidor, R., Tennant, K.L. & Singer, R.N. (1996) The generalizability effect of three learning strategies across motor task performance. International Journal of Sport Psychology, 1, P 23-36.

136. Lofthus, G. K. & Hanson C. (1980) Influence of laterality and fatigue upon the performance of a two-handed reaction task. Research Quarterly for Exercise and Sport, 51, P501-508.

137. Ma, Q. W. & Zhang, L. W. (1998) Exercise Psychology. Zhejiang Educational Publisher & Taiwan East China Publisher, 1998, P 273-275.

138. Magill, R. A. (1994) Motor learning: Concepts and applications. Fourth Edition, WCB. Brown & Benchmark Publishers, Dubuque, IA, P20-24.

139. Magill, R. A. (1998) Motor learning: Concepts and applications. Fifth Edition, WCB. Brown & Benchmark Publishers, Dubuque, IA, P156-169.

140. Magill R. A., Chamberlin, C. J. & Hall, K. G. (1991) Verbal knowledge of results as redundant information for learning an anticipation timing skill. Human Movement Science, 10, P485-507.

141. Malanga, G. A. Jenp, Y. N. & Growney, E. S. (1996) EMG analysis of shoulder positioning in testing and strengthening the supraspinatus. Medicine and Science in Sports and Exercise, 28, P661-664.

142. MaLean, B. D. & Tumilty, D. McA. (1993) Left-right asymmetry in two types of soccer kick. British Journal of Sports Medicine, 27, P260-262.

143. Malina, R. M. (1968) Effects of varied information feedback, practice conditions on throwing speed and accuracy. Research Quarterly, 40, P134-145.

144. Maoge, S. (1991) A study of reaction time of bilateral limbs. Ph. D dissertation, P1-70.

145. Markos, P. (1979) Ipsilateral and contralateral effects of proprioceptive neuromuscular facilitation techniques on hip motion and electomyographic activity. Physical Therapy, 59, P1366-1373.

146. Marques-Bruna, P. & Grimshaw, P. N. (1997) 3-dimensional kinematics of overarm throwing action of children age 15 to 30 months. Perceptual and Motor Skill, 84, P1267-1283.

147. Marteniuk, R. G. (1976) Information processing in motor skill. New York: Holt, Rinehart, & Winston, P221-223.

148. Marteniuk, R. G., MacKenzie, C. L. & Baba, D. M. (1984) Bimanual movement control: Information processing and interaction effects. Quarterly Journal of Experimental Psychology: Human Experimental Psychology, 3, P335-365.

149. Mazziotta, J. C., Grafton, S. T., & Woods, R. C. (1991) The human motor system studied with PET measurements of cerebral blood flow topography and motor

learning. In: Brain Work and Mental Activity, Alfred Benzen Symposium 31 (Lassen N. A., Ingvar D. H., Raichle M. E., Friberg L, ed), Copenhagen: Munksgaard, P280-290.

150. McDonald, P. V., Van Emmerik, R.E. A. & Newell, K. M. (1989) The effects of practice on limb kinematics in a throwing task. Journal of Motor Behavior, 21, P245-264.

151. Meier, M. J. & French, L. A. (1965) Lateralization deficits in complex visual discrimination and bilateral transfer of reminiscence following unilateral temporal lobectomy. Neuropsychologia, 3, P261-272.

152. Miall, R. C., Weir, D. J., Wolpert, D. M., & Stein, J. F. (1993) Is the cerebellum a smith predictor? Journal of Motor Behavior, 25, P203-216.

153. Milisen, R. & P. Van (1939) Differential transfer of training in a rotary activity. Journal of Experimental Psychology, 24, P640-646.

154. Moore, J. B. & Reeve, G. T. (1987) Effects of task demands on throwing performance of children. Perceptual and Motor Skills, 65, P503-506.

155. Mount, J. (1996) Effect of practice of a throwing skill in one body position on performance of the skill in an alternate position. Perceptual and Motor Skill, 83, P723-732.

156. Moynes, D. R., Perry, J., Antonell, D J. & Jobe, F. W. (1986) Electromyography and motion analysis of the upper extremity in sports. Physical Therapy, 66, P1905-1911.

157. Munn, N. L. (1932) Bilateral transfer of learning. Journal of Experimental Psychology, 15, P343-353.

158. Murphy, S. M. & Jowdy, D. P. (1995) Imagery and Mental Practice. In Advances in Sport Psychology, Horn, T. S. (Eds), P221-250.

159. Nakamura, R. & Saito, H. (1974) Preferred hand and reaction time indifferent movement paths. Perceptual and Motor Skills, 39, P1275-1281.

160. Nakamura, R., Taniguchi, R., & Oshima, Y. (1975) Synchronization error in bilateral simultaneous flexion of elbows. Perceptual and Motor Skills, 40, P527-532.

161. Nakazawa, K., Masani, K., Miyashata, M. & Yano, H. (1994) EMG activities of mono-and bi-articular muscles during goal-directed ballistic movement. Human Movement Science, 13, P601-610.

162. Neal, R. J., Snyder, C. W. & Kroonenberg, P. M. (1991) Individual differences and segment interactions in throwing. Human Movement Science, 10, P653-676.

163. Nelson, J. K., Thomas, J. R., & Nelson, J. R. (1991) Longitudinal change in throwing performance: Gender differences. Research Quaterly for Exercise and Sport, 62, P105-108.

164. Nelson, J. K., Thomas, J. R., Nelson, J. R. & Abraham, P. C. (1986) Gender differences in children's throwing performance: Boilogy and environment. Research Quaterly for Exercise and Sport, 57, P280-287.

165. Newell, K. M. & Corcos D. M. (1993) Issues in Variability and Motor Control. Variability and Motor Control. Human Kinetics Publishers. P1-12.

166. Ning, Z. H., Faro, A., Sue, D. & Hamilton, N. (1999) Kinesiological analysis of overarm throwing for accuracy with dominant and non-dominant arms. Scientific

Proceedings: ISBS' 99: XVII International Symposium on Biomechanics in Sport. In Sander, R. H. (Eds.), 1999, P 37-40.

167. Ning, Z. H. & Liu, Y. D. (1992) A preliminary study of bilateral transfer in the learning of sport skills. The Proceeding of Chinese 4th Conference in Physical Education and Sport Science, Weifang, Shangdong, China.

168. Nougier, V., Orliaguet, J. P. & Martin, O. (1993) Kinematic modifications of the manual reaching in climbing: Effects of environmental and corporal constraints. International Journal of Sport Psychology, 24, P379-390.

169. Oda, S. & Moritani, T. (1994) Maximal isometric force and neural activity during bilateral and unilateral elbow flexion in humans. European journal of applied physiology and occupational physiology, 69, P240-243.

170. Parker, H. E., Monson, K. P. & Larkin, D. (1993) Symmetrical and asymmetrical motor control in children: Bipedal and unpedal hopping. Human Movement Science, 12, P179-193.

171. Parker-Taillon, D. & Kerr, R. (1989) Manual asymmetries within the performance of a complex motor task. Human Movement Science, 8, P33-44.

172. Parlow, S. E. & Dewey, D. (1991) The temporal locus of transfer of training between hands: An interference study. Behavioral Brain Research, 46, P1-8.

173. Parlow, S. E. & Kinsbourne, M. (1989) Asymmetrical transfer of training between hands: Implications for inter-hemispheric communication in normal brain, Brain and Cognition, 11, 98-113.

174. Parlow, S. E. (1978) Differential finger movement and hand preference. Cortex, 14, 608-611.

175. Peters, M. (1980) Why the preferred hand taps more quickly than the nonpreferred hand: Three experiments on handedness. Canadian Journal of Psychology, 34, P62-71.

176. Peters, M. & Durding, B. M. (1979) Left-handers and right-handers compared on a motor task. Journal of Motor Behavior, 11, P103-111.

177. Petersen, S.E., Fox, P.T., Posner, M.I., Mintun, M. & Raichle, M.E. (1989) Positron emission tomographic studies of the processing of single words. Journal of Cognitive Neuroscience, 1, P153-170.

178. Pienaar, A. E. (1992) Left-handedness, laterality and gross co-ordination of six to nine year old children. South African Journal for Research in Sport, Physical Education and Recreation, 15, P33-39.

179. Porro, C. A., Francescato, M. P. Cettolo, V. Diamond, M. E., Baraldi, P., Zuiani, C. Bazzocchi, M. & Prampero, P. E. (1996) Primary motor and sensory cortex activation during motor performance and motor imagery: A functional magnetic resonance imaging study. The Journal of Neuroscience, 16, P7688-7696.

180. Passos, S. C. (1989) Efeitos da variabilidade de pratica na aprendizagem de uma habilidade motora. Universidade de Sao Paulo, Sao Paulo, Sport Discus 1975-2000/9.

181. Preilowski, B. (1990) Intermanual transfer, interhemispheric interaction, and handedness in man and monkeys. In C. Trevarthen (Ed.), Brain circuits and functions

of the mind: Essays in honor of Roger W. Sperry. Cambridge, England: Cambridge University Press, P168-180.

182. Provine, R. R. & Westerman, J. A. (1979) Crossing the midline: limits of early eye-hand behavior. Child Development, 50, P437-441.

183. Provins, K. A. (1997) The specificity of motor skill and manual asymmetry: A review of the evidence and its implications. Journal of Motor Behavior, 29, P183-192.

184. Provins, K. A. & Magliaro, J. (1989) Skill, strength, handedness, and fatigue. Journal of Motor Behavior, 21, P113-121.

185. Puretz, S. L. (1983) Bilateral transfer: The effects of practice on the transfer of complex dance movement patterns. Research Quarterly for Exercise and Sport. 54, P48-54.

186. Raichle, M. E., Fiez, J. A., Videen, T. O., MacLeod, A. K., Pardo, J. V., Fox, P. T., & Petersen, S. E. (1994) Practice-related changes in human brain functional anatomy during non-motor learning. Cerebral Cortex, 4, P8-26.

187. Railey, J. H. (1976) Effects of instruction and practice on the skill of throwing with the non-dominant hand. Research Quarterly, 47, P864-868.

188. Raudsepp, L., & Paasuke, M. (1995) Gender differences in fundamental motor patterns, motor performances and strength measurements of prepubertal children. Paediatric Exercise Science, 7, P294-304.

189. Richardson, A. (1967a) Mental practice: a review and discussion. Part I, Research Quarterly, 38, P95-107.

190. Richardson, A. (1967b) Mental practice: a review and discussion. Part II, Research Quarterly, 38, P263-273.

191. Roberton, M. A. (1977) Stability of stage categorizations across trials: Implications for the 'stage theory" of overarm throw development. Journal of Human Movement Studies, 3, P49-59.

192. Roberton, M. A. (1978) Longitudinal evidence for developmental stages in the forceful overarm throw. Journal of Human Movement Studies, 4, P167-175.

193. Roberton, M. A., Halverson, L. E., Langendorfer, S. & Williams, K. (1979) Longitudinal changes in children's overarm throw ball velocities. Research Quarterly, 50, P256-264.

194. Roberton, M. A., Halverson, L. E. & Erbaugh, S. (1981) Interrelationships between developmental levels and ball velocity in the overarm throws of kindergarten children (Abstract). In G. Roberts & D. Landers (Eds.), Psychology of Motor Behavior and Sport, 1980, P202, Champaign, IL: Human Kinetics.

195. Roberton, M.A. & Halverson, L. E. (1984) Developing children----Their changing movement. Philadelphia: Lea & Febiger.

196. Roland P. E. (1987) Metabolic mapping of sensorimotor integration in the human brain, In: Motor Areas of the Cerebral Cortex, edited by Bock G, O'Connor M, and Marsh J, Ciba Foundation Symposium #132, John Wiley and Sons, Ltd, Chichester, UK, P251-268.

197. Roland, P. E., Eriksson, L., Widen, L., & Stone, S. (1988) Changes in regional cerebral oxidative metabolism induced by tactile learning and recognition in man. European Journal of Neuroscience, 1, P3-17.

198. Rutherford, O. M. & Jones, D. A. (1986) The role of learning and coordination in strength training. European Journal of Applied Physiology and Occupational Physiology, 55, P100-105.

199. Sanchez, F. S. (1976) Methodology of investigation on bilateral transfer of learning and its specific application to sport. Revista de investigacion del Instituto Nacional de Educacion Fisica, Madrid, P193-104.

200. Sauerwein, H. C. & Lassonde, M. (1994) Cognitive and sensori-motor functioning in the absence of the corpus callosum: neuropsychological studies in callosal agenesis and callosotomized patients. Behavior Brain Research, 64, P229-240.

201. Schmidt, R. A., Zelaznik, H. N., Hawkins, B., Frank, J. S. & Quinn, J. T. (1979) Motor Output Variability: A Theory for the Accuracy of Rapid Motor Acts. Psychological Review, 86, P415-451.

202. Schmidt, R. A. & Young, D. E. (1987) Transfer of movement control in motor skill learning. In S.M. Cormier and J. D. Hagman (Eds.) Transfer of learning, Orlando, FL: Academic Press, P47-49.

203. Schmidt, R. A. (1991) Motor learning & performance: from principles to practice. Human Kinetics Books, Champaign, IL. P77-225.

204. Schmidt, R. A. (1987) Motor control and learning: a behavioral emphasis. 2nd edition, Human Kinetics Books, Champaign, IL.

205. Schmidt, R. A. (1999) Motor control and learning: A behavioral emphasis. 3rd edition, Human Kinetics, Champaign, IL.

206. Schmidt, R. C., Treffner, P. J., Shaw, B. K. & Turvey, M. T. (1992) Dynamical aspects of learning an interlimb rhythmic movement pattern. Journal of Motor Behavior, 24, P67-83.

207. Schot, P. K., Bates, B. T. & Dufek, J. S. (1994) Bilateral performance symmetry during drop landing: a kinetic analysis. Medicine and Science in Sports and Exercise (Indianapolis, Ind.), 26, P1153-1159.

208. Seitz, R. J., Roland, P. E., Bohm, C., Greitz, T., & Stone, E. S. (1990) Motor learning in man: a positron emission tomography study. NeuroReport 1, P57-66.

209. Shapiro, D. C. (1977) Preliminary attempt to determine the duration of a motor program. In D. N. Landers and R. W. Christina (Eds) Psychology of Motor Behavior and Sport, 1976, P17-24, Human Kinetics, Champaign, IL.

210. Shea, C. H., Shebilske, W. L. & Worchel, S. (1993) Motor learning and control: theoretical perspectives on motor control. Prentice Hall, New Jerey. P166-277.

211. Sherwood, D. E. (1994) Hand preference, practice order, and spatial assimilations in rapid bimanual movement. Journal of Motor Behavior. 26, P123-134.

212. Sherwood, C. P. (1995) A 3-D kinematic analysis of between-subject differences in baseball throwing. Unpublished master's thesis, Arizona State University, Tempe, Arizona.

213. Smith, P. J. (1995) Applying contextual interference to the Pawlata roll. Journal of Sport Sciences, P455-462.

214. Smutok, M. A. (1989) Effects of unilateral brain damage on contralateral and ipsilateral upper extremity function in hemiplegia. Physical Therapy,

215. Spirduso, W. W., Lee, W. A. & Baylor, A. M. (1980) Initiation of bilateral responses in a kinesthetic reaction time task. Journal of Motor Behavior. 12, P173-184.

216. Stacks, D. W. & Andersen, P. A. (1987) Toward a Holistic Neurophysiological understanding of intrapersonal communication. Paper presented at the Annual Meeting of the Speech Communication Association (73rd , Boston, MA), P33.

217. Stacks, D. W. & Andersen, P. A. (1989) The modular mind: intrapersonal communication. Southern Communication Journal, 54, P273-293.

218. Stallings, L. M. (1982) Motor learning from theory to practice. The C. V. Mosby Company, St. Louis, P210-212.

219. Starosta, W. (1985) Coordination and symmetrization of movement. Rivista di Cultura Sportiva (SDS, Roma), 4, P11-17.

220. Starosta, W. (1989) Symmetry or asymmetry in the improvement of sports technique. Kultura Fizyczna(Physical Culture, Warsaw), 43, P14-16.

221. Steenhuis, R. E. (1996). Hand preference and performance in skilled and unskilled activities. In Elliott, D. & Roy E. A.(Eds.): Manual asymmetries. Boca Raton, FL: CRC Press. P123-142.

222. Stelmach, G. E. (1968) Efficiency of motor learning as a function of inter-trial rest. Research Quarterly, 40, P198-202.

223. Stoddard, J. & Vaid, J. (1996) Asymmetries in intermanual transfer of maze learning in right- and left-handed adults. Neuropsychologia, 34, P605-608.

224. Summers, J. J., Ford, S. K. & Todd, J. A. (1993) Practice effects on the coordination of the two hands in a bimanual tapping task. Human Movement Science, 12, P111-133.

225. Swift, E. J. (1903) Studies in the psychology and physiology of learning. American Journal of Psychology, 14, P201-251.

226. Tassinari G., Aglioti, S. Pallini, R. Berlucchi, G. & Rossi, G. F. (1994) Interhemispheric integration of simple visuo-motor responses in patients with partial callosal defects. Behavior Brain Research. 64, P141-149.

227. Taylor, H. G., & Heilman, K. M. (1980) Left-hemisphere motor dominance in right-handers. Cortex, 16, P587-603.

228. Teixeira, L. (1993) Bilateral transfer of learning: the effector side in focus. Journal of Human Movement Studies, 25, P243-253.

229. Thach, W. T. (1996) On the specific role of the cerebellum in motor learning and cognition: clues from PET activation and lesion studies in man. Behavioral and Brain Sciences, 3, P411-431.

230. Thomas, J. R. (1984) Children's motor skill development. In J.R. Thomas (Ed.), Motor development during childhood and adolescence. Minneapolis, MN: Burgess, 1984. P91-104.

231. Thomas, J. R. & Nelson, J. K. (1996) Research methods in physical activity. Human Kinetics, Champaign IL.

232. Todor, J. I. & Kyprie, P. M. (1980) Hand differences in the rate and variability of rapid tapping. Journal of Motor Behavior, 12, P57-60.

233. Todor, J. I., Kyprie, P. M. & Price, H. L. (1982) Lateral asymmetries in arm, wrist, and finger movements. Cortex, 18, P515-523.

234. Todor, J. I. & Cisneros, J. (1985) Accommodation to increased accuracy demands by the right and left hands. Journal of Motor Behavior, 17, P355-372.

235. Todor, J. I. & Smiley, A. (1985) Performance differences between the hands: Implications for studying disruption to limb praxis. In E. A. Roy (Ed), Neuropsychological Studies of Apraxia, Amsterdam: North-Holland. P309-344.

236. Todor, J. I. & Lazarus, J. C. (1986) Exertion level and the intensity of associated movements. Developmental Medicine and Child Neurology, 28, P205-212.

237. Tosi, S. H. C. F. (1989) Transferencia bilateral de uma habilidade motora complexa do basquetebol. Universidade de Sao Paulo, Sao Paulo, Thesis (M. Ed.), P147.

238. Vagenas, G. & Hoshizaki, B. (1991) Functional asymmetries and lateral dominance in the lower limbs of distance runners. International Journal of Sport Biomechanics, 7, P311-329.

239. Vandervoort, A. A., Sale, D. G. & Moroz, J. R. (1987) Strength-velocity relationship and fatigability of unilateral versus bilateral arm extension. European Journal of Applied Physiology and Occupational Physiology, 56, P201-205.

240. Van der Meulen, J. H. P., Gooskens, R. H. J. M., Denier van der Gon, J. J., Gielen, C. C. A. M. & Wilhelm, K. (1990) Mechanisms underlying accuracy in fast goal-directed arm movements in man. Journal of Motor Behavior, 22, P67-84.

241. Van Gyn, G. H., Wenger, H. A. & Gaul, C. A. (1990) Imagery as a Method of Enhancing Transfer from Training to Performance. ??

242. Van Galen, C. P. (1991) Handwriting: Issues for a psychomotor theory. Human Movement Science, 10, P165-191.

243. Van Rossum, J. H. A. (1990) Schmidt's schema theory: The empirical base of the variability of practice hypothesis. A critical analysis. Human Movement Science, 9, P387-435.

244. Vorro, J. & Hobart, D. (1981) Kinematic and myoelectric analysis of skill acquisition: I. 90 cm subject. Archives of Physical Medicine and Rehabilitation, 62, P575-582.

245. Wadman, W. J. & Denier van der Gon, J. J. (1980) Muscle activation patterns for fast goal-directed arm mvoements. Journal of Human Movement Studies, 6, P19-37.

246. Wallin, D., Ekblom, B., Grahn, R. & Nordenborg, T. (1985) Improvement of muscle flexibility: a comparison between two techniques. American Journal of Sports Medicine. 13, P263-268.

247. Ward, J. P., Alvis, G. R. Sanford, C. G., Dodson, D. L. & Pusakulich, R. L. (1989) Qualitative differences in tactuo-spatioal motor learning by left-handers, Neuropsychologia, 27, P1091-1099.

248. Wieg, E. (1932) Bilateral transfer in the motor learning of young children and adults. Child Development, 3, P247-267.

249. Weir, P. L. & Leavitt, J. L. (1990) Effects of model's skill level and model's knowledge of results on the performance of a dart throwing task. Human Movement Science, 9, P369-383.

250. Wickens, J., Hyland, B. & Anson, G. (1994) Cortical cell assemblies: a possible mechanism for motor programs. Journal of Motor Behavior, 26, P66-82.

251. Wild, M. R. (1938) The behavior pattern of throwing and some observations concerning its course of development in children. Research Quaterly, 9, P20-24.

252. Wilkinson, S. (1996) Visual analysis of the overarm throw and related sport skills: training and transfer effects. Journal of Teaching in Physical Education, 16, P66-78.

253. Williams, K., Haywood, K. M. & Vansant, A. (1998) Changes in throwing by older adults: a longitudinal investigation. Research Quarterly for Exercise and Sport, 69, P1-10.

254. Williams, K., Haywood, K. M. & Painter, M. A. (1996a) Environmental versus biological influences on gender differences in the overarm throw for force: Dominant and nondominant arm throws. Women in Sport and Physical Activity Journal, Fort Worth, 5, Fall, P29-48.

255. Williams, K., Haywood, K. M. & Vansant, A. (1996b) Force and accuracy throws by older adult: II. Journal of Aging and Physical Activity, 4, P194-202.

256. Williams, K., Haywood, K. M. & Vansant, A. (1993) Force and accuracy throws by older adult performers. Journal of Aging and Physical Activity, 1, P2-12.

257. Wolpaw, J. R. (1994) Acquisition and maintenance of the simplest motor skill: investigation of CNS mechanisms. Medicine and Science in Sports and Exercise (Indianapolis,-Ind.); 26, P1475-1479.

258. Woodworth, R. S. (1899) The accuracy of voluntary movement. Psychological review, 13, (Monograph supplement), P1.

259. Wrisberg, C. A., Dale, G. A., Liu, Z. & Reed, A. (1995) The effects of augmented information on motor learning: A multidimensional assessment. Research Quarterly for Exercise and Sport, 66, P9-16.

260. Wuyts, I. J., Summers, J. J., Carson, R. G., Byblow, W. D. and Semjen, A. (1996) Attention as a mediating variable in the dynamics of bimanual coordination. Human Movement Science, 15, P877-897.

261. Yamamoto, M. (1982) Hemispheric asymmetry in tactile recognition tasks with left and right handers. Japanese Journal of Psychology, 53, P106-109.

262. Yan, J. H., Hinrichs, R. N., Payne, V. G. & Thomas, J. R. (2000a) Normalized Jerk: A measure to capture developmental characteristics of young girls' overarm throwing. Journal of Applied Biomechanics 16, P196-203.

263. Yan, J. H., Payne, V. G. & Thomas, J. R. (2000b) Developmental kinematics of young girls' overarm throwing. Research Quarterly for Exercise and Sport, 71, P92-98.

264. Young, D. E., Cohen, M. J. & Husak, W. S. (1993) Contextual interference and motor skill acquisition: On the processes that influence retention. Human Movement Science, 12, P577-600.

265. Young, R. P. & Marteniuk, R. G. (1995) Changes in inter-joint relationships of muscle moments and powers accompanying the acquisition of a multi-articular kicking task. Journal of Biomechanics, 28, P701-713.