ESS3805

Biomechanical Analysis of Human Movement

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1.

Sports Science - LibGuides at University of Exeter. http://libguides.exeter.ac.uk/SportsScienceHomePage.

2.

Dixon, S. The science and engineering of sport surfaces. (Routledge, 2013).

3.

Nigg, B. M. & Herzog, W. Biomechanics of the Musculo-Skeletal System. (John Wiley & Sons, 2007).

4.

Bartlett, R. Introduction to Sports Biomechanics: Analysing Human Movement Patterns. (Routledge, 2007).

5.

Bartlett, R. & Bussey, M. Sports biomechanics: reducing injury risk and improving sports performance. (Routledge, 2012).

6.

Nigg, B. M. & Herzog, W. Chapter 3. Measuring Techniques [in] Biomechanics of the Musculo-Skeletal System. in Biomechanics of the Musculo-Skeletal System 293–333 (John Wiley & Sons, 2007).

7.

Bartlett, R. Introduction to sports biomechanics: analysing human movement patterns. (Routledge, 2007).

8.

Cavanagh, P. R. & Lafortune, M. A. Ground Reaction Forces in Distance Running [in] Journal of Biomechanics, Vol.13, No.5. Journal of Biomechanics **13**, 397–406 (1980).

9.

Miller, D. I. Chapter 8: Ground reaction forces in distance running [in] Biomechanics of Distance Running. in Biomechanics of Distance Running 203–224 (Human Kinetics Books, 1990).

10.

Bates, B. T., Osternig, L. R., Sawhill, J. A. & James, S. L. An assessment of subject variability, subject-shoe interaction, and the evaluation of running shoes using ground reaction force data [in] Journal of Biomechanics. Journal of Biomechanics **16**, 181–191 (1983).

11.

Bobbert, M F, Schamhardt, H. C. & Nigg, B. M. Calculation of vertical ground reaction force estimates during running from positional data [in] Journal of Biomechanics. Journal of **24**, 1095–1105 (1991).

12.

Bobbert M F, Yeadon, M. R. & Nigg, B. M. Mechanical analysis of the landing phase in hell-toe running (Analyse mecanique de la phase d'impact lors de la course avec appui sur le talon d'abord) [in] Journal of Biomechanics. Journal of **25**, 223–234 (1992).

13.

Hamill, Joseph, Russell, E., Gruber, A. & Miller, R. Impact characteristics in shod and

barefoot running [in] Footwear Science. Footwear **3**, 33–40 (2011).

14.

Keller, T. et al. Relationship between vertical ground reaction force and speed during walking, slow jogging, and running [in] Clinical Biomechanics. Clinical Biomechanics **11**, 253–259 (1996).

15.

Nordin, A. D., Dufek, J. S. & Mercer, J. A. Three-dimensional impact kinetics with foot-strike manipulations during running [in] Journal of Sport and Health Sciences. Journal of Sport and Health Science **6**, 489–497 (2017).

16.

Melvin R. Ramey. Force plate designs and applications [in] Exercise and sport sciences reviews. Exercise and sport sciences reviews **3**, 303–319 (1975).

17.

Andrew A Biewener & Full, R. J. Force platform and kinematic analysis [in] Biomechanics: structures and systems : a practical approach. in Biomechanics: structures and systems : a practical approach 45–73 (IRL Press at Oxford University Press, 1992).

18.

Dainty, D. A. & Norman, R. W. Standardizing biomechanical testing in sport. (Human Kinetics, 1987).

19.

Melvin R. Ramey. Force plate designs and applications [in] Exercise and sport sciences reviews. Exercise and sport sciences reviews **3**, 303–319 (1975).

20.

Bates, B. T., Osternig, L. R., Sawhill, J. A. & James, S. L. An assessment of subject

variability, subject-shoe interaction, and the evaluation of running shoes using ground reaction force data [in] Journal of Biomechanics. Journal of Biomechanics **16**, 181–191 (1983).

21.

Bobbert, M. F., Yeadon, M. R. & Nigg, B. M. Mechanical Analysis of the Landing Phase in Heel-Toe Running [in] Journal of Biomechanics, Vol.25, No.3. Journal of Biomechanics **25**, 223–234 (1992).

22.

Lafortune, M. A., Hennig, E. M. & Lake, M. J. Dominant role of interface over knee angle for cushioning impact loading and regulating initial leg stiffness [in] Journal of Biomechanics, Vol.29, No.12. Journal of Biomechanics **29**, 1523–1529 (1996).

23.

Nigg, B. M., Herzog, W. & Read, L. J. Effect of viscoelastic shoe insoles on vertical impact forces in heel-toe running [in] American Journal of Sports Medicine, Vol.16, No.1. The American Journal of Sports Medicine **16**, 70–76 (1988).

24.

O'Leary, K., Anderson Vorpahl, K. & Heiderscheit, B. Effect of Cushioned Insoles on Impact Forces During Running [in] Journal of the American Podiatric Medical Association, Vol.98, No.1. Journal of the American Podiatric Medical Association **98**, 36–41.

25.

Denoth, J. Load on the locomotor system and modelling [in] Biomechanics of Running Shoes. in Biomechanics of Running Shoes 63–116 (Human Kinetics Publishers, 1985).

26.

Dixon, S. J., Collop, A. C., Singleton, T. M. & Batt, M. E. Compensatory adjustments in lower extremity kinematics in response to a reduced cushioning of the impact interface in heel-toe running [in] Sports Engineering, Vol.8, No.1. Sports Engineering **8**, (2005).

27.

Dixon, S. J., Waterworth, C., Smith, C. V. & House, C. M. Biomechanical analysis of running in military boots with new and degraded insoles [in] Medicine and Science in Sports and Exercise, Vol.35, No.3. Medicine and Science in Sports and Exercise **35**, 472–479 (2003).

28.

Hamill, J., Russell, E. M., Gruber, A. H. & Miller, R. Impact characteristics in shod and barefoot running [in] Footwear Science, Vol.3, No.1. Footwear Science **3**, 33–40 (2011).

29.

Lafortune, M. A. & Lake, M. J. Human pendulum approach to simulate and quantify locomotor impact loading [in] Journal of Biomechanics, Vol.28, No.9. Journal of Biomechanics **28**, 1111–1114 (1995).

30.

Lieberman, D. E. et al. Foot strike patterns and collision forces in habitually barefoot versus shod runners [in] Nature, Vol.463, No.7280. Nature **463**, 531–535 (2010).

31.

Nigg, B. Biomechanical considerations on barefoot movement and barefoot shoe concepts [in] Footwear Science, Vol.1, No.2. Footwear Science **1**, 73–79 (2009).

32.

Shorten, M. & Mientjes, M. I. V. The 'heel impact' force peak during running is neither 'heel' nor 'impact' and does not quantify shoe cushioning effects [in] Footwear Science, Vol.3, No.1. Footwear Science **3**, 41–58 (2011).

33.

Bates, B. T., Dufek, J. S. & Davies, H. P. The effect of trial size on statistical power [in] Medicine and Science in Sports and Exercise, Vol.24, No.9. Medicine and Science in Sports and Exercise **24**, 1059–1068 (1992).

34.

Bates, B. T., Osternig, L. R., Sawhill, J. A. & James, S. L. An assessment of subject variability, subject-shoe interaction, and the evaluation of running shoes using ground reaction force data [in] Journal of Biomechanics, Vol.16, No.3. Journal of Biomechanics **16**, 181–191 (1983).

35.

Bobbert, M. F., Yeadon, M. R. & Nigg, B. M. Mechanical Analysis of the Landing Phase in Heel-Toe Running [in] Journal of Biomechanics, Vol.25, No.3. Journal of Biomechanics **25**, 223–234 (1992).

36.

Brown, R. P. Performance tests for artificial sports surfaces [in] Polymer Testing, Vol.7, No.4. Polymer Testing **7**, 279–292 (1987).

37.

Coyles, V. R., Lake, M. J. & Patritti, B. L. Comparative evaluation of soccer boot traction during cutting manoeuvres: methodological considerations for field testing [in] Engineering of Sport. in The Engineering of Sport 183–190 (Blackwell Science Ltd, 1998).

38.

Dixon, S. J., Batt, M. E. & Collop, A. C. Artificial playing surfaces research: a review of medical, engineering and biomechanical aspects [in] International Journal of Sports Medicine, Vol.20, No.4. International Journal of Sports Medicine **20**, 209–218 (1999).

39.

Dixon, S. J. & Stiles, V. H. Impact absorption of tennis shoe-surface combinations [in] Sports Engineering, Vol.6, No.1. Sports Engineering **6**, 1–9 (2003).

40.

Hamill, J., van Emmerik, R. E. A., Heiderscheit, B. C. & Li, L. A dynamical systems approach to lower extremity running injuries [in] Clinical Biomechanics, Vol.14, No.5. Clinical Biomechanics **14**, 297–308 (1999).

41.

Hennig, E. M., Valiant, G. A. & Liu, Q. Biomechanical variables and the perception of cushioning for running in various types of footwear [in] Journal of applied biomechanics, Vol.12. Journal of applied biomechanics **12**, 143–150 (1996).

42.

James, C. R. Effects of injury proneness and task difficulty on joint kinetic variability [in] Medicine and science in sports and exercise, Vol.32, No.11. Medicine and science in sports and exercise **32**, 1833–1844 (2000).

43.

Lafortune, M. A. New approach to assess in vivo rearfoot control of court footwear during sidestepping moves [in] Journal of applied biomechanics, Vol.13, No.2. Journal of applied biomechanics **13**, 197–204 (1997).

44.

Messier, S. P. & Pittala, K. A. Etiologic factors associated with selected running injuries [in] Medicine and science in sports and exercise, Vol.20, No.5. Medicine and science in sports and exercise **20**, 501–505 (1988).

45.

Miller, D. I. Chapter 8.Ground reaction forces in distance running [in] Biomechanics of Distance Running. in Biomechanics of Distance Running 203–223 (Human Kinetics Books, 1990).

46.

Nigg, B. M. Biomechanics of Running Shoes. (Human Kinetics Publishers, 1985).

47.

Nigg, B. M. & Yeadon, M. R. Biomechanical aspects of playing surfaces [in] Journal of Sports Sciences, Vol.5. Journal of Sports Sciences **5**, 117–145 (1987).

48.

Nigg, B. M., Stefanyshyn, D. J. & Cole, G. K. Sport surfaces: biomechanics, injuries, performance, testing, installation. (University Of Calgary, Human Performance Laboratory, 2003).

49.

Stiles, V. H. & Dixon, S. J. The biomechanical assessment of tennis surface cushioning properties during a tennis specific movement (long abstract). International Society of Biomechanics XIXth Congress https://isbweb.org/images/conf/2003/html/_longAbstractsByAuthor.html (2003).

50.

Stiles, V. H. & Dixon, S. J. The influence of different playing surfaces on the biomechanics of a tennis running forehand foot plant [in] Journal of Applied Biomechanics, Vol.22. Journal of Applied Biomechanics **22**, 14–24 (2006).

51.

Stiles, V. & Dixon, S. Biomechanical response to systematic changes in impact interface cushioning properties while performing a tennis-specific movement [in] Journal of Sports Sciences, Vol.25, No.11. Journal of Sports Sciences **25**, 1229–1239 (2007).

52.

Subotnick, S. I. The biomechanics of running: implications for the prevention of foot injuries [in] Sports Medicine, Vol.2. Sports Medicine **2**, 144–153 (1985).

53.

Stiles, V. H. Biomechanical Response to Changes in Natural Turf during Running and Turning [in] Journal of Applied Biomechanics, Vol.27, No.1. Journal of Applied Biomechanics **27**, 54–63 (2011).

54.

Stiles, V. H., James, I. T., Dixon, S. J. & Guisasola, I. N. Natural Turf Surfaces [in] Sports Medicine, Vol.39, No.1. Sports Medicine **39**, 65–84 (2009).

55.

Milani, T. L., Schnabel, G. & Hennig, E. M. Rearfoot motion and pressure distribution patterns during running in shoes with varus and valgus wedges [in] Journal of Applied Biomechanics, Vol.11. Journal of Applied Biomechanics **11**, 177–187 (1995).

56.

Nigg, B. M. Pressure Distribution [in] Biomechanics of the Musculo-Skeletal System. in Biomechanics of the Musculo-Skeletal System 334–342 (John Wiley & Sons, 2007).

57.

Windle, C. M., Gregory, S. M. & Dixon, S. J. The shock attenuation characteristics of four different insoles when worn in a military boot during running and marching [in] Gait & Posture, Vol.9, No.1. Gait & Posture **9**, 31–37 (1999).

58.

Bartlett, R. Chapter 5: 'Causes of movement - forces and torgues' [in] Introduction to Sports Biomechanics. in Introduction to Sports Biomechanics: Analysing Human Movement Patterns 213–220 (Routledge, 2007).

59.

Cavanagh, P. R. & Lafortune, M. A. Ground reaction forces in distance running [in] Journal of Biomechanics, Vol.13, No.5. Journal of Biomechanics **13**, 397–406 (1980).

60.

Dixon, S. J., Waterworth, C., Smith, C. V. & House, C. M. Biomechanical analysis of running in military boots with new and degraded insoles [in] Medicine and Science in Sports and Exercise, Vol.35, No.3. Medicine and Science in Sports and Exercise **35**, 472–479 (2003).

61.

Dixon, S. J. Application of center-of-pressure data to indicate rearfoot inversion-eversion in shod running [in] Journal of the American Podiatric Medical Association, Vol.96, No.4. Journal of the American Podiatric Medical Association **96**, 305–312 (2006).

62.

Dixon, S. J. & McNally, K. Influence of orthotic devices prescribed using pressure data on lower extremity kinematics and pressures beneath the shoe during running [in] Clinical Biomechanics, Vol.23, No.5. Clinical Biomechanics **23**, 593–600 (2008).

63.

Fong, D. T.-P. et al. A three-pressure-sensor (3PS) system for monitoring ankle supination torque during sport motions [in] Journal of Biomechanics, Vol.41, No.11. Journal of Biomechanics **41**, 2562–2566 (2008).

64.

Low, D. C. & Dixon, S. J. Footscan pressure insoles: accuracy and reliability of force and pressure measurements in running [in] Gait & Posture, Vol.32, No.4. Gait & Posture **32**, 664–666 (2010).

65.

Tessutti, V., Trombini-Souza, F., Ribeiro, A. P., Nunes, A. L. & Sacco, I. de C. N. In-shoe plantar pressure distribution during running on natural grass and asphalt in recreational runners [in] Journal of Science and Medicine in Sport, Vol.13, No.1. Journal of Science and Medicine in Sport **13**, 151–155 (2010).

66.

Nigg, B. M. & Herzog, W. Biomechanics of the Musculo-Skeletal System. (John Wiley & Sons, 2007).

67.

Hamill, J. & Knutzen, K. M. Chapter 12. Types of Mechanical Analysis [in] Biomechanical basis of human movement. in Biomechanical basis of human movement 458–468 (Williams

& Wilkins, 1995).

68.

Winter, D. A. Overall principle of lower limb support during stance phase of gait [in] Journal of Biomechanics, Vol.13, No.11. Journal of Biomechanics **13**, 923–927 (1980).

69.

Winter, D. A. Moments of force and mechanical power in jogging [in] Journal of Biomechanics, Vol.16, No.1. Journal of Biomechanics **16**, 91–97 (1983).

70.

Simpson, K. J. & Bates, B. T. The effects of running speed on lower extremity joint moments generated during the support phase [in] International Journal of Sport Biomechanics, Vol.6. International Journal of Sport Biomechanics **6**, 309–324 (1990).

71.

Alexander, R. McN. & Vernon, A. The dimensions of knee and ankle muscles and the forces they exert [in] Journal of Human Movement Studies, Vol.1. Journal of Human Movement Studies **1**, 115–123 (1975).

72.

Burdett, R. G. Forces predicted at the ankle during running [in] Medicine and Science in Sports and Exercise, Vol.14. Medicine and Science in Sports and Exercise **14**, 308–316 (1982).

73.

Kerwin, D. G. & Dixon, S. J. The influence of heel lift manipulation on Achilles tendon loading in running [in] Journal of Applied Biomechanics, Vol.14. Journal of Applied Biomechanics **14**, 374–389 (1998).

74.

Dixon, S. J. & Kerwin, D. G. Variations in Achilles tendon loading with heel lift intervention in heel-toe runners [in] Journal of Applied Biomechanics, Vol.18. Journal of Applied Biomechanics **18**, 321–331 (2002).

75.

Nigg, B. M. & Herzog (eds), W. Biomechanics of the Musculo-Skeletal System. (Wiley, 1999).

76.

Komi, P. V. Relevance of in vivo force measurements to human biomechanics [in] Journal of Biomechanics, Vol.23. Journal of Biomechanics **23**, 23–34 (1990).

77.

Lichtwark, G. A. & Wilson, A. M. Interactions between the human gastrocnemius muscle and the Achilles tendon during incline, level and decline locomotion [in] Journal of Experimental Biology, Vol.209, No.21. Journal of Experimental Biology **209**, 4379–4388 (2006).

78.

Reinschmidt, C. & Nigg, B. M. The influence of heel height on ankle joint moments in running [in] Medicine and Science in Sports and Exercise, Vol.27. Medicine and Science in Sports and Exercise **27**, 410–492 (1995).

79.

Rugg, S. G., Gregor, R. J., Mandelbaum, B. R. & Chiu, L. In vivo moment arm calculations at the ankle using magnetic resonance imaging (MRI) [in] Journal of Biomechanics, Vol.23, No.5. Journal of Biomechanics **23**, 495–501 (1990).

80.

Scott, S. H. & Winter, D. A. Internal forces at chronic running injury sites [in] Medicine and Science in Sports and Exercise, Vol.22. Medicine and Science in Sports and Exercise **22**, 357–369 (1990).

81.

Alexander, R. McN. Storage and release of elastic energy in the locomotor system and the stretchshortening cycle [in] Biomechanics and Biology of Movement. in Biomechanics and Biology of Movement 19–29 (Human Kinetics, 2000).

82.

Butler, R. J., Crowell, H. P. & Davis, I. M. Lower extremity stiffness: implications for performance and injury [in] Clinical Biomechanics, Vol.18, No.6. Clinical Biomechanics **18**, 511–517 (2003).

83.

Coyles, V. R., Lake, M. J. & Lees, A. Dynamic angular stiffness of the knee and ankle during barefoot and shod running [in] Proceedings of the 5th Symposium on Footwear Biomechanics. in Proceedings of the 5th Symposium on Footwear Biomechanics 26–27 (Dept. of Minerals, ETH Zurich, 2001).

84.

Farley, C. T., Glasheen, J. & McMahon, T. A. Running springs: speed and animal size [in] Journal of Experimental Biology, Vol.185. Journal of Experimental Biology **185**, 71–86 (1993).

85.

Farley, C. T. & González, O. Leg stiffness and stride frequency in human running [in] Journal of Biomechanics, Vol.29, No.2. Journal of Biomechanics **29**, 181–186 (1996).

86.

Farley, C. T., Houdijk, H. H. P., Van Strien, C. & Louie, M. Mechanism of leg stiffness adjustment for hopping on surfaces of different stiffnesses [in] Journal of Applied Physiology, Vol.85, No.3. Journal of Applied Physiology **85**, 1044–1055 (1998).

87.

Farley, C. T. & Morgenroth, D. C. Leg stiffness primarily depends on ankle stiffness during human hopping [in] Journal of Biomechanics, Vol.32, No.3. Journal of Biomechanics **32**,

267–273 (1999).

88.

Ferris, D. P. & Farley, C. T. Interaction of leg stiffness and surface stiffness during human hopping [in] Journal of Applied Physiology, Vol.82, No.1. Journal of Applied Physiology **82**, 15–22 (1997).

89.

Ferris, D. P., Farley, C. T. & Louie, M. Running in the real world: adjusting leg stiffness for different surfaces [in] Proceedings of the Royal Society: Biological Sciences, Vol.265, No.1400. Proceedings of the Royal Society: Biological Sciences **265**, 989–994 (1998).

90.

Ferris, D. P., Liang, K. & Farley, C. T. Runners adjust leg stiffness for their first step on a new running surface [in] Journal of Biomechanics, Vol.32, No.8. Journal of Biomechanics **32**, 787–794 (1999).

91.

Kuitunen, S., Komi, P. V. & Kyrolainen, H. Knee and ankle joint stiffness in sprint running [in] Medicine and Science in Sports and Exercise, Vol.34, No.1. Medicine and Science in Sports and Exercise **34**, 166–173 (2002).

92.

Lafortune, M. A., Hennig, E. M. & Lake, M. J. Dominant role of interface over knee angle for cushioning impact loading and regulating initial leg stiffness [in] Journal of Biomechanics, Vol.29, No.12. Journal of Biomechanics **29**, 1523–1529 (1996).

93.

McMahon, T. A. & Greene, P. R. The Influence of Track Compliance on Running [in] Sport Shoes and Playing Surfaces: Biomechanical Properties. in Sport Shoes and Playing Surfaces: Biomechanical Properties 138–162 (Human Kinetics, 1984).

94.

Walker, C. & Blair, R. An experimental review of the McMahon/Cheng model of running [in] Sports Engineering, Vol.4, No.3. Sports Engineering **4**, 113–121 (2001).