

Deborah L. King

curriculum vitae

Work:

Department of Exercise & Sport Sciences
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Ithaca College
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EDUCATION

The Pennsylvania State University, University Park, Pennsylvania

Department of Exercise and Sport Science

Doctor of Philosophy, Exercise and Sport Science, December 1997

Specialization in Biomechanics

Dissertation advisor: Vladimir Zatsiorsky, Ph.D.

Dissertation title: *Movement patterns, biomechanics, and performance characteristics of one legged standing.*

University of Massachusetts, Amherst, Massachusetts

Department of Exercise Science

Master of Science, Exercise Science, September 1992

Thesis advisor: Joseph Hamill, Ph.D.

Thesis title: *The effects of a high intensity exhaustive run on running mechanics and running economy during steady state exercise in women.*

Bates College, Lewiston, Maine

Department of Mathematics

Bachelor of Science, Mathematics, June 1990, magna cum laude

PRESENT POSITION

Associate Professor – August 2007 to present

Department of Exercise and Sport Sciences

Ithaca College

RESEARCH PAPERS, ARTICLES, BOOK CHAPTERS

Publications - Refereed

Benson, A., Abendroth-Smith, J., King, D., and Swenson, T. Comparison of rowing on a stationary and dynamic ergometer. *Journal of Sports Sciences and Medicine*. (accepted for publication 1/2011).

Czapla, R., Sforzo, G., and King, D. Optimizing Power Output by Varying Repetition Tempo. Accepted for Publication Journal of Strength and Conditioning Research.

King, D., Smith, S., Brown, M., McCrory, J., Muncasy, B., and Scheirman, G. (2008). Comparison of split double and split triple twists in pair figure skating. *Sport Biomechanics*, 7(2):222-237.

Gross, M., Swensen, T., King, D. (2007). Nonconsecutive- versus Consecutive-Day High-Intensity Interval Training in Cyclists. *Medicine and Science in Sports and Exercise*, 39(9): 1666-71.

Harnish, C.R., T. Swensen, and D. King (2007). Effect of cycling position on economy and cadence in trained cyclists during hill climbing at various power outputs. *European Journal of Applied Physiology*, 99(4): 387-391.

King, D.L. (2005). Performing triple & quadruple figure skating jumps: implications for training. *Canadian Journal of Exercise Physiology*, 30(6): 743-753.

King, D.L., Smith S.L., Higginson, B.K., Muncasy, B., and Scheirman, G.L. (2004). Characteristics of triple and quadruple figure skating jumps performed during the Salt Lake City 2002 Winter Olympics. *Sport Biomechanics*, 3(1): 109-123.

King, D.L. and Zatsiorsky, V.M. (2002). Periods of extreme ankle displacement during one legged standing. *Gait & Posture*, 15(2): 172-179.

Rodgers, M., Mulcare, J., King, D., Mathews, T., Gupta, S., and Glaser, R. (1999). Gait characteristics of individuals with Multiple Sclerosis before and after a six month aerobic training program. *Journal of Rehabilitation Research, & Development*, 36(3): 183-8

Zatsiorsky, V.M. and King, D.L. (1998). An algorithm for determining gravity line location from posturographic recordings. *Journal of Biomechanics*, 31: 161-4.

King, D.L. and Zatsiorsky, V.M. (1997). Extracting gravity line displacement from stabilographic recordings. *Gait & Posture*, 6: 27-38.

King, D.L., Arnold, A.S., and Smith, S.L. (1994). A kinematic comparison of single, double, and triple axels. *Journal of Applied Biomechanics*, 10: 51-60.

Boulay, M.R., Rundell, K.W., and King, D.L. (1994). Effect of slope variation and skating technique on velocity in cross-country skiing. *Medicine and Science in Sports and Exercise*, 27: 281-287.

Chapters in Books

King, D.L. (2004). Biomechanics. In M.A. Bradley & D. Miller (Eds.) *Coach's Guide to Figure Skating Sports Sciences and Medicine: Second Edition*. Professional Skaters Association, Rochester, Minnesota.

King, D.L. (2001). Biomechanics. In M.A. Bradley & D. Miller (Eds.) *Coach's Guide to Figure Skating Sports Sciences and Medicine: First Edition*. Professional Skaters Association, Rochester, Minnesota.

King, D.L. (2000). Jumping in Skating. In V.M. Zatsiorsky (Editor) *Olympic Encyclopedia of Sports Medicine Volume IX: Biomechanics in Sport*. Blackwell Science, Ltd., London, England.

Reviewed and Other Publications

King, D. (2010). *SS 201 - Sport Safety/Science - Biomechanics of Spinning*. United States Figure Skating Continuing Education Requirement Online Course, administered by the Professional Skating Association (www.skatepsa.com).

King, D. (2010). *SS 201 - Sport Safety/Science - Biomechanics of Jumping*. United States Figure Skating Continuing Education Requirement Online Course, administered by the Professional Skating Association (www.skatepsa.com).

King, D., Smith, S., and Casey, K. (2006). How'd they do that triple combination jump: Part 1? Accepted for Publication: *Professional Skater*, September/October 2006.

King, D., Smith, S., and Casey, K. (2006). How'd they do that triple combination jump: Part 2? *Professional Skater*, March/April 2006: 12-13.

King, D.L. and Smith, S.L. (2006). How high does you skater jump? *Professional Skater: Sports Science and Medicine Tidbit*, online publication, Professional Skater's Association. <http://www.skatepsa.org>.

King, D.L. and Smith, S.L. (2005). Skating – It's a balancing act. *Professional Skater: Sports Science and Medicine Tidbit*, online publication, Professional Skater's Association. <http://www.skatepsa.org>.

King, D.L. and Smith, S.L. (2005). What is important in analyzing figure skating jumps? *Professional Skater*, September/October, 2005

Smith, S.L. and King, D.L. (2005). What about those new, new boots? *Professional Skater*, January/February 2005.

Smith, S.L. and King, D.L. (2004). How'd they do that split triple twist? *Professional Skater*, November/December 2004.

Smith, S.L. and King, D.L. (2003). Sport biomechanics for figure skating coaches. *Professional Skater*, March/April 2003.

King, D. Smith, S. and Casey, K. (2002). How'd they do that toe-loop? Part II. *Skating*, 79(4): 70-71.

King, D. Smith, S. and Casey, K. (2002). How'd they do that toe-loop? Part I. *Skating*, 79(3): 62-63, 76.

King, D. Smith, S. and Casey, K. (2002). How'd they do that triple lutz? Part II. *Skating*, 79(1): 64-65.

King, D., Smith, S., and Casey, K. (2001). How'd they do that triple lutz? Part I. *Skating*, 78(12): 48-49.

King, D., Smith, S., and Casey, K. (2001). Your skater is in what position to perform that jump? *Skating*, v. 78(9), pp. 46-47.

King, D.L. (2000). Skaters jump with revolutionary force. *Biomechanics*, 12(2): 55-63.

King, D.L. (1997). A biomechanical analysis of the axel: critical parameters for successful jumps. *Professional Skater*, January/February.

Arnold, A.S., King, D.L., and Smith, S.L. (1995). The physics of jumping and rotating. *Biomechanics*, 7(2): 55-66.

Arnold, A.S., King, D.L., and Smith, S.L. (1994). Figure skating and sports biomechanics: the basics of jumping and rotating. *Skating*, 71.

CONFERENCE PROCEEDINGS (last 5 years)

Belyea, B, Sigg J, King, D. The effects of MBT footwear on balance in an older adult: A case study. *Medicine & Science in Sports & Exercise*. 42(5) Supplement: S350, May 2010.

Czapla, R., Sforzo, G., King, D. (2009). Optimizing Power Output by Varying Repetition Tempo. *Proceedings from the Mid Atlantic Regional American College of Sports Medicine Regional Conference*, Hershey, PA, November, 2009.

King, D., Hannon, J., Shoup, E. (2009). Effect of Technique on Knee, Hip, and L5/S1 Net Moments in the Parallel Back Squat (Abstract #1107). *33rd American Society of Biomechanics Annual Meeting*, State College, PA, August 23-26, 2007.

Belyea, B, Sigg, J., King, D. (2009). The effect of Masai Barefoot Technology footwear on balance in an older adult: case study. *Proceedings from the American College of Sports Medicine Annual Meeting*, Seattle, WA, May 2009.

King, D., Sigg, J., Belyea, B., Buck, M., and Hummel, C. (2008). The Effects of Fatigue on the Knee Moment during a Stop and Go Task. *Proceedings from the Mid Atlantic Regional American College of Sports Medicine Regional Conference*, Hershey, PA, November, 2008.

Shoup, E., Hannon, J., King, D. (2008). Net Muscle Moments at L5/S1, Hip, and Knee during Modified Olympic and Modified Power Squats. *Proceedings from the Mid*

Atlantic Regional American College of Sports Medicine Regional Conference, Hershey, PA, November, 2008.

Tenan, M.S., Ives, J.C., King, D.L. (2007). Quantifying Neuromuscular Fatigue of the Quadriceps Complex in a Graded Exercise Test. *Proceedings from the Mid Atlantic Regional American College of Sports Medicine Regional Conference*, Hershey, PA, November, 2007.

Sigg, J., Belyea, B., King, D., Dick, M., Murphy, M., Teeter, L., and Whited, M. (2008). Relationship Of Hip Abductor Strength And Ground Reaction Forces In Adolescent Female Soccer Players (Abstract #1458). *Proceedings from the American College of Sports Medicine Annual Meeting*, Indianapolis, IN, May 2008.

King, D., Smith, S., Brown, M., McCrory, J., Muncasy, B., and Scheirman, G. (2007). Comparison of split double twists and split triple twists in pair figure skating. *Proceedings from 31st American Society of Biomechanics Annual Meeting*, Palo Alto, CA, August 23-26, 2007.

Nabinger, C., King, D., & Swensen, T (2007). The effects of the menstrual cycle on strength and power in female athletes. *Proceedings from the American College of Sports Meeting Annual Meeting*, New Orleans, LA, May 2007.

Nabinger, C., King, D., & Swensen, T (2006). The effects of the menstrual cycle on strength and power in female athletes. *Proceedings from the Mid-Atlantic Meeting, American College of Sports Meeting*, Hershey, PA, November, 2006.

King, D., Sigg, J., Belyea, B., Hummel, C., and Buck, M. (2006). Effects of fatigue on lower extremity joint kinematics during a stop and go landing task. *Proceedings from 30th American Society of Biomechanics Annual Meeting*, Blacksburg, VA, September 6-9, 2006. Paper # 135.

Sigg, J., Belyea, B., King, D., Hummel, C., and Buck, M. (2006). Impact mechanics during jumping and cutting tasks under fatigued and non fatigued conditions. *Proceedings from American Physical Therapy Association- Clinical Sports Medicine Conference 2006*, San Diego, CA, February 2006.

Benson A., Swenson, T., and King, D. (2005). Comparison of rowing on stationary and dynamic ergometers. *Proceedings from 52nd American College of Sports Medicine Annual Meeting*, San Francisco, CA, May 2005.

Benson A., Swenson, T., and King, D. (2005). Comparison of rowing on stationary and dynamic ergometers. *Proceedings from the Mid Atlantic Regional Conference American Society of Sports Medicine Annual Meeting*, Bushkill, PA, November, 2004.

King, D., Sigg, J., Belyea, B., Hummel, C., and Buck, M. (2005). Impact mechanics during stop and go tasks under fatigued and non fatigued conditions. *Proceedings from*

XXth Congress of the International Society of Biomechanics and 29th Annual Meeting of the American Society of Biomechanics, Cleveland, OH. August 2005.

Smith, S.L., King, D.L., Brown, M.R., Higginson, B.K., Scheirman, G.L., and Muncasy, B.A. (2003). Biomechanical characteristics of split triple twists of pair figure skaters. Proceedings from 7th *International Olympic Committee World Congress on Sports Science*, Athens, Greece. October, 2003.

Hogan, S., King, D., Campbell, C., and Miles, M. (2003). Relationship of Age, Season, Diet, and Physical Activity to Blood Lipids and Fibrinogen. Proceedings from 50th *American College of Sports Medicine Annual Meeting*, San Francisco, CA, May 28 –June 1, 2003. (*Medicine & Science in Sports & Exercise*, 2003; 35(Suppl.):S349, 2003)

Miles, M.P., Hogan, S.P., and King, D. (2003). Impact of acute infection but not change in physical activity on blood lipids and fibrinogen. Proceedings from 50th *American College of Sports Medicine Annual Meeting*, San Francisco, CA May 28 –June 1, 2003. (*Medicine & Science in Sport & Exercise*, 35(Suppl.):S380, 2003)

King, D.L. and Smith, S.L. (2003). Biomechanical characteristics of the quad toe-loop. Proceedings from 4th *International Skating Union World Congress on Sports Science*, March, 2003, Washington, DC, USA.

Smith, S.L. and King, D.L. (2003). Biomechanical characteristics of the split triple twist. Proceedings from 4th *International Skating Union World Congress on Sports Science*, March, 2003, Washington, DC, USA.

Miles, M.P., Hogan, S.P., Campbell, C.G., and King, D. (2002). Physical activity, diet, and seasonal changes in fibrinogen and lipoproteins. Proceedings from *NIH Meeting: Interaction of Physical Activity & Nutrition: Biological Remolding & Plasticity*, Washington, DC, December 2002.

King, D. (2002). Biomechanics of quadruple jumps in figure skating. Proceedings from *World Congress of Biomechanics, Symposium of Aerial Movement in Sport*, Calgary, Canada, August 4-8, 2002.

King, D. (2002). A biomechanical analysis of successful and unsuccessful quadruple salchow figure skating jumps. Proceedings from 6th *IOC World Congress on Sport Science*, Salt Lake City, UT held in conjunction with the 49th *American College of Sports Medicine Annual Meeting*, St. Louis, MO, May 29-June 1, 2002.

Murphy, O.F., Heil, D.P., and King, D.L. (Sponsor: M.P. Miles, FACSM) (2002). Validity of a stationary cycling protocol for tracking changes in uphill cycling time-trial performance. Proceedings from 49th *Annual Meeting of the American Society of Sports Medicine*. St. Louis, MO, May 29-June 1, 2002 (*Medicine & Science in Sports & Exercise*, 2002; 34(5 Suppl.): 22S.)

Hogan, S.P., Kelsey, M., King, D.L., and Miles, M.P. (2002). Influence of physical activity on inflammatory and anthropometric markers associated with atherosclerosis.

Proceedings from 2002 Regional Meeting of Northwest American College of Sports Medicine. (*Medicine & Science in Sports & Exercise*, 34(5 Suppl): 81S.)

Miles, M., Hogan, S., Kelsey, King, D., Duffner, K., and Campbell, C. (2002). Age, diet, physical activity and plasma lipid peroxidation kinetics. Proceedings from 49th Annual Meeting of the American Society of Sports Medicine, St. Louis, MO, May 29-June 1, 2002. (*Medicine & Science in Sports & Exercise*, 2002; 34(5 Suppl.): 249S.)

Monahan, K.R., Heil, D.P., King, D.L., Murphy, O.L., and Miles, M.P. (2002). Inter-subject variability and the impact of muscle unloading on muscle function. Proceedings from 2002 Regional Meeting of Northwest American College of Sports Medicine.

Johnson, M. and King, D. (2001). A kinematic analysis between the triple and quadruple figure skating jumps. Proceedings from 25th Annual Meeting of the American Society of Biomechanics, University of California - San Diego, San Diego, CA.

King, D. (2001). Generation of vertical velocity in toe-pick figure skating jumps. Proceedings from *Biomechanics Symposia 2001: International Society of Biomechanics in Sport*, San Francisco, CA.

King, D., Murphy, O., and Johnson, M. (2000). A technique to enlarge the 3D control volume using multiple calibration frames and the DLT. Proceedings from 24th Annual Meeting of the American Society of Biomechanics, University of Illinois at Chicago, Chicago, IL.

INVITED PRESENTATIONS

Professional Skaters Association National Seminar, September 2010. Morrisville, NY Ice Plex. *Injury Prevention in Figure Skating*. Featured Speaker.

Cayuga Sports Medicine Seminar, March 2010, Cayuga Sports Medicine/Island Health Fitness Center, Ithaca, NY. *Figure Skaters Jump into a Skating Revolution: Implications for Injury and Performance*. Invited speaker.

University of Illinois, 2008-2009 Physics Colloquium Series, January 29, 2009. *From Take-off to Landing: Biomechanical Issues in the Sport of Figure Skating*, guest speaker for Physics of Skating Colloquium at bequest of Dr. Stutske.

Canadaigua Sports Medicine Seminar, March 2008, Thompson Health, Canadaigua, NY. *Biomechanical Issues in the Sport of Figure Skating*. Invited speaker.

4th Annual Off Ice Power, Strength, and Conditioning Testing Clinic, March 4, 2006. *On and Off Ice: Biomechanics of Figure Skating for Parents*. OSF Center for Sports Medicine and Health Fitness, St. Antony Medical Center, Rockport, IL. Featured Speaker.

4th Annual Off Ice Power, Strength, and Conditioning Testing Clinic, March 4, 2006. *On and Off Ice: Biomechanics of Figure Skating for Skaters and Coaches*. OSF Center for Sports Medicine and Health Fitness, St. Antony Medical Center, Rockport, IL. Featured Speaker.

American College of Sports Medicine 53rd Annual Meeting, Denver, CO, May 31-June 3, 2006. *Physiological and Biomechanical Demands of Elite Figure Skaters*, in the Symposium Physiological and Biomechanical Demands of Elite Figure Skaters

American College of Sports Medicine 51st Annual Meeting, St. Louis, MO, June 2-5, 2004. *Critical Factors of Figure Skating Jumps* in Mini-Symposium B-04: Biomechanics of High Performance in Ice Sports.

American Alliance of Health, Physical Education, Recreation, and Dance 2004 Annual Meeting, New Orleans, LA, March 31-April 3, 2004. *Sport Biomechanics: Communicating with Coaches & Athletes – Success Stories with Figure Skating* in NASPE and Biomechanics Academy sponsored session: Sports Biomechanics – What Needs to be Communicated with Athletes.

Canadian Society of Exercise Physiology, Niagara-on-the-Lake, Toronto, Canada, October 2003. Presented: *Analysis of Figure Skating Jumps & Implications for Training* in Symposium VIII: On ice sports performance.

ISU World Congress on Sport Science, Washington D.C., March 2003. Presenting author of *Biomechanical Characteristics of Quadruple Toe-loop*, second author of *Biomechanical Characteristics of Split Triple Twist* and co-leader of symposium on *Video Tools for the Rink*.

IOC World Congress on Sports Sciences held in conjunction with American College of Sports Medicine, St. Louis, MO, May 29-June 1, 2002. Pfizer/IOC Olympic Research Project Symposium: *Generation of Angular Momentum and Vertical Velocity in Quadruple Revolution Figure Skating Jumps*.

World Congress on Biomechanics, Calgary, Canada, August 4-9, 2002. A biomechanical analysis of successful and unsuccessful quadruple toe-loop figure skating in the symposium *Sport: Aerial Movement* (Chair: Fred Yeadon).

Professional Skaters Association Annual Meeting, Las Vegas, NV, May 2001. *Biomechanical Analysis of Figure Skating Jumps: Triple Lutz*.

Professional Skaters Association Coaches College, Colorado Springs, CO, May 1999. *Biomechanics and Figure Skating*.

Professional Skaters Association World Conference, Chicago, IL, May 1996. *A Biomechanical Analysis of The Axel: Critical Parameters for Successful Jumps*.

United States Olympic Committee Sports Science and Technology Quadrennial Conference, Colorado Springs, CO. November 1996.

panelist - Involving Coaches in Sports Science.

United States Figure Skating Association Team USA Camp, Colorado Springs, CO, September 1995. *Biomechanics of Single, Double, and Triple Axels.*

OTHER PRESENTATIONS

Figure Skating Medical Symposium, Cayuga Medical Center: Sports Medicine and Athlete Performance, January 30, 2011. Cicero Twin Rinks, Cicero, NY. *Warm-up for Success: A figure skaters guide to warm-up and stretching.* Featured Speaker.

Figure Skating Medical Symposium, Cayuga medical Center: Sports medicine and Athlete Performance, December 6, 2010. Island health and Fitness, Ithaca, NY. *Warm-up for Success: A figure skaters guide to warm-up and stretching.* Featured Speaker.

FUNDED AND SPONSORED GRANTS/AWARDS/PROJECTS

US Figure Skating Project to evaluate technical scoring system with high speed cameras during novice and junior events at 2009 US Figure Skating Championships. Project was initiated and Funded by US Figure Skating. Value in Kind Contributions \$4,500.

Ithaca College Faculty Release Time Program. Awarded three credits release time for the academic year 2006/2007 to create a human movement video digital resource.

Ithaca College Faculty Release Time Program. Awarded three credits release time for the academic year 2005/2006 to complete a computer programming project.

King, D. Knee Joint Dynamics during Stop and Go Tasks under Fatigued and Non Fatigued Condition. \$3,500. Ithaca College Summer Research Grants Program. Summer 2003.

Ithaca College Faculty Release Time Program. Awarded three credits release time for the academic year 2003/2004 to complete a computer programming project.

Co-Director of United States Figure Skating Project on Skating Biomechanics funded by the United States Olympic Committee Sports Partnership Program totaling \$29,450. Project includes analyzing old video data and directing a project on triple triple jumps and split triple twists at the ISU Grand Prix Finals in Colorado Springs, CO, 2003.

King D and Smith, S. Generation of Angular Momentum and Vertical Velocity in Quadruple Revolution Figure Skating Jumps. \$22,800. Pfizer/IOC Olympic Research Project under the auspices of the IOC Medical Commission. 2002.

King, D. Teaching and Learning at Montana State University faculty fellow mini-grant recipient. \$9,750. Funded by Teaching and Learning at MSU through the National Science Foundation. Fall 2001.

King, DL and Muncasy, B. Biomechanical Analyses of The Approach and Take-off of Figure Skating Skills. \$29,693. Funded by United States Olympic Committee Sports Science and Technology Grant Program and USFSA. 2000.

King, DL. A Biomechanical Analysis of Figure Skating Jumps Performed during Competition by Skaters Participating in US National Championships. \$28,968. Funded by United States Olympic Committee Sports Science and Technology Grant Program. Grant #SST99-FSK-002. 1999.

King, D.L. and Fortney, V.L. A Biomechanical Analysis of Single, Double, and Triple Axels: Critical Parameters for Successful Jumps. \$11,012. Funded by United States Olympic Committee Sports Science and Technology Grant Program. Grant #SST95-FSK-001. 1995.

GRANT PROPOSALS SUBMITTED

King, D. (2009). Muscle activation patterns in figure skaters: do figure skates alter the motor control patterns of jumping and landing of figure skaters? Submitted to The Delysis Prize.

King, D. and Lockwood, K. Defining Success of Landing. Does the ¾ mark landing allow for mechanically sound execution of landings in multi revolution jumps? \$19985.00. Submitted to United States Figure Skating Sports Science and medicine research grant and Skate Canada. postponed for review to 2010-2011 budget year by USFS due to elimination of grant budget line by USFS due to budget cuts.

King, D and Sigg, J. Human movement digital library for science education. \$73,000. Submitted to the National Science Foundation, June 2003. Not funded.

King, D. and Marley, R. The effects of frequency on lifting kinematics. \$175,000. Submitted to the National Institutes of Health, Spring 2001. Not funded.

Challis, J., Zatsiorsky, V, and King, D. The mechanics of exchanges during short track speed skating relay races. \$9,350. Submitted to the International Olympic Committee, Spring 2001. Not funded.

King, D.L. and Smith, S.L. In skate pressure and lower limb kinematics during edge and toe figure skating jumps. \$15,829. Submitted to the United States Olympic Committee Sports Science and Technology Grant Program, October 1996. Not funded.

RESEARCH REPORTS

King, D. (2010). A Biomechanical Analysis of The Stabilizer®. Report to David Minotti, co-owner of Swing Stabilizer, Elmira, NY.

King, D. (1999). A biomechanical analysis of two sprint start techniques. Report to Jody Kappel, supporter of a research project on the traditional sprint start technique and the Kappel Split Sprint Start Technique.

Zatsiorsky, V., King, D., and Hartman, M. (1997). Strength and power requirements of elite platform divers. Report to USA Diving for coaches' education as part of the Techniscience Council program.

Nelson, R.C., King, D.L., Acero, J., and Johnstonbaugh, J. (1995). Assessment of axial loading forces during head impacts: hardshell versus Pro-Cap mounted helmets. Report for Pro-Cap, Erie, PA.