Gregory J. Welk, Ph.D.

Iowa State University

Department of Kinesiology

EDUCATION:

Ph.D. Arizona State University, Tempe, AZ, May 1994
Department of Exercise Science and Physical Education
Program: Exercise and Wellness
Dissertation: The Assessment of Physical Activity in Children
Mentor: Charles B. Corbin Ph.D.

M.A. University of Iowa, Iowa City, Iowa, May 1989
Exercise Science Department
Major: Exercise Physiology
Thesis: The Effect of Exercise on the Thermic Response to Glucose and Fructose
Advisor: Thomas W. Balon, Ph.D.

B.S. University of Illinois - Champaign-Urbana, May 1986
Liberal Arts and Sciences:
Concentration: Bioengineering
Independent Study: Sport Biomechanics Department
Advisor: Jack L. Groppel, Ph.D.

PROFESSIONAL EXPERIENCE

1/00 – Pres. Associate Professor
Department of Health and Human Performance
Iowa State University, Ames, IA 50011

6/96-12/99 Director of Childhood and Adolescent Health
Cooper Institute for Aerobics Research
Dallas, TX 75230

8/94-6/96 Assistant Professor
Department of Health, Physical Education, Recreation and Dance
Eastern Michigan University, Ypsilanti, MI 48197

Research Interests and Ongoing Work

My research interests focus on various aspects of physical activity epidemiology. My work focuses on physical activity in youth but I have broad interest in the promotion of physical activity (and health) across the lifespan. A brief description of some major areas of research is provided below. Additional information about my research program including links to graduate student projects, summaries of ongoing work and details on the Health and Exercise Promotion Lab where I conduct my work are provided at the bottom of the page.

Physical Activity Assessment Research

Accurate measures of physical activity are needed for a variety of physical activity research areas. A major focus of my work has been on developing and validating better assessments of physical activity. Emphasis in this research is on the development of effective assessment techniques to assess activity patterns in children but applications with adults are also investigated. I have used a variety of devices and instruments including accelerometry-based activity monitors, heart rate monitors, direct observation tools (BEST) and various self report measures.

- Click here to see a listing of publications related to physical activity assessment.
- Click here to see descriptions of some of the specific assessment tools used in the lab

Physical Activity Promotion Research

Increasing population levels of physical activity requires a better understanding of the correlates of physical activity and the development of effective interventions that can be disseminated. Most of my work on physical activity promotion has emphasized youth but my interests extend across the lifespan. My work with youth is based on a social-ecological model of physical activity behavior that is specific for youth (Youth Physical Activity Promotion Model – Welk, 1999). Additional work has explored the utility of a psychological model of physical self concept in youth (Children and Youth Physical Self Perception Profile) that assesses perceptions of competence in the physical domain. Work is currently exploring parental influences on physical activity in youth and in the development and evaluation of interventions designed to promote activity in youth.
Click here to read a brief description of the Youth Physical Activity Promotion Model.
Click here to see a listing of publications related to physical activity promotion

Physical Activity Epidemiology Research

Physical activity is related to physical fitness, fatness and a number of other health related variables. Research aimed at understanding associations between physical activity and other health related outcomes has been an increasing area of interest. Much of this work has been facilitated through collaborations with Dr. Joe Eisenmann who runs the Pediatric Exercise Science Lab in the Department.

Click here to see a listing of publications related to physical activity epidemiology

Research on FITNESSGRAM and ACTIVITYGRAM

FITNESSGRAM is a fitness and activity assessment software package that is used in school-based physical education programs. The software was developed by the Cooper Institute for Aerobics Research and it is currently used in thousands of schools across the country to facilitate the assessment and tracking of fitness and activity data in physical education programs. I served as the Director of Childhood and Adolescent Health at the Cooper Institute prior to coming to ISU and continue to serve as the Scientific Director of the FITNESSGRAM program. A major part of my research program emphasizes the evaluation of the assessments and the behavior change tools designed to promote activity and fitness in children.
Click here for a listing of publications related to FITNESSGRAM
Click here for a description of the Fitnessgram module
Click here for a description of the Activitygram module
Click here to read the FITNESSGRAM Reference Guide
Click here to access additional information on FITNESSGRAM (http://www.fitnessgram.net).

For further information contact:
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Teaching Related Activities

Undergraduate Courses Taught:

I teach two undergraduate courses in the health promotion area (**HS 380 – Worksite Health Promotion** and **HS 430 – Community Health Program Planning**). Students in the Health and Fitness Management option take the HS 380 class as one of their required professional courses. They receive broad based coverage of health promotion program planning and specific experience with the coordination and planning of worksite health promotion programs. Students in the Community Health Education option take both the HS 380 course and the HS 430 course to provide a more extensive background in health promotion planning. The HS 430 course covers a variety of issues involved in community health programming and emphasizes the use of social-ecological models of health promotion. Additional details are provided below.

HS 380 – Worksite Health Promotion
The course covers the design and implementation of worksite health promotion programs and the benefits these programs have for both employees and employers. Students will review various health risk appraisals and plan theory-based incentive programs designed to promote positive lifestyles. The course emphasizes service learning as a primary class activity. Students work together in groups to deliver the health promotion program for a local company (Tones Spices).
Click here to see a description of HS 380 learning outcomes.
Click here to see a copy of the most recent syllabus.
Click here to see the Service Learning website for the Tones Company
Click here to read student reflections about the service learning activities.

HS 430 – Community Health Program Planning.
The course will cover techniques of needs assessment, program design, administration, and evaluation of community health education programs in various settings. Emphasis will be placed on broad public health issues and what strategies in community health education would be useful to address these problems.
Click here to see a description of HS 430 learning outcomes. The course emphasizes service learning as a primary class activity. Students work together in groups to help coordinate the activities of the Story County Healthy Lifestyle Taskforce.
Click here to see a copy of the most recent syllabus.
Click here to see the Service Learning website for the Tones Company

Graduate Courses Taught
EXSP 570 – Physical Activity and Public Health
This graduate level course covers the broad scope of research on physical activity and public health. Emphasis is placed on the application of physical activity assessment techniques since accurate measures are needed to more accurately assess the health benefits from physical activity and to evaluate the effectiveness of behavioral interventions designed to promote physical activity.

Other Teaching Related Work
I serve as the faculty coordinator for the Health and Human Performance (HHP) Learning Community. A key component of the learning community is our Foundation course (HS 255 – Disciplines and Professions in Health and Human Performance) that is required for all students in our program. This foundation course provides an overview of the various disciplines and professions within the physical activity or kinesiology field. Students learn basic concepts in each of the core disciplines to help prepare them for upper division coursework in these areas. Students also learn about the different professional outlets to help them select an option that best fits their interests and needs. The course is team taught by the faculty and staff within the department of Health and Human Performance.

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List of Recent Publications

Welk, G.J., Eisenmann, J.C., Trost, S., Schaben, J.W., Dale, D.D. (2007) Calibration of the Biotrainer Pro Activity Monitor for Youth using Receiver Operator Characteristic (ROC) Curves. Pediatric Exercise Science. In Press.

Wickel, E.E., **Welk, G.J.**, & Eisenmann, J.C. (2006). Concurrent validation of the Bouchard diary with an accelerometry-based activity monitor. *Medicine and Science in Sports and Exercise*, In Press.

Schaben, J.A., **Welk, G.J.**, Joens-Matre, R., & Hensley, L. (2006). Reliability and validity of the children and youth physical activity correlates scale in children and adolescents. *Journal of Physical Activity and Health*, In Press.

Mahar, M.T., **Welk, G.J.**, Rowe, D.A., Crotts, D.J., & McIver, K.L. (2006). Development and validation of a regression model to estimate VO_{2peak} from PACER 20-m shuttle run performance. *Journal of Physical Activity and Health*, In Press.

McClain, J., **Welk, G.J.**, Ihmels, M., Schaben, J.W. (2006). Comparison of two versions of the PACER aerobic fitness test. *Journal of Physical Activity and Health*, In Press.

Ihmels, M., **Welk, G.J.**, & McClain, J. (2006). Convergent validity of field tests of body composition in young adolescents. *Journal of Physical Activity and Health*. In Press.

Dishman, R.K., Motl, R.W., Sallis, J.F., Dunn, A., Birnbaum, A. **Welk, G**. Bedimo-Rung, A., Voorhees, C. & Jobe, J. (2005). Self-management strategies mediate the association of self-efficacy with physical activity. *American Journal of Preventive Medicine*. In Press.

Eisenmann**,** J.C., Wickel, E.E., **Welk, G.J.**, & Blair, S.N. (2005). Relationship between adolescent fitness and fatness and cardiovascular disease risk factors in adulthood: the Aerobics Center Longitudinal Study. *American Heart Journal*, 149:46-53.

Voorhees, C.C., Murray, D, **Welk, G.J.**, Birnbaum, A., Ribisl, K.M., Johnson, C.C., Pfeiffer, K.A., Saksvig, B., Jobe, & J.B. (2005). The role of peer social network factors and physical activity in adolescent girls. *American Journal of Health Behavior*, 29(2):183-190.

Welk, G.J., & Eklund, B. (2005). Validation of the Children and Youth Physical Self-Perception Profile in young children: A confirmatory factor analysis. *Psychology of Sports and Exercise*, 6(1), 51-65.

Eisenmann, J.C.; Heelan, K., & **Welk, G.J.** (2004). Assessing body composition among 3 to 8 year-old children: anthropometry, BIA, and DXA. *Obesity Reseaerch*, 12: 1633-1640.

McMurray, R.G., Ring, K.B. Treuth, M.S., **Welk, G.J.**, Pate, R.R., Schmitz, M.K. Pickrel, J., Gonzalez, V., Almedia, M.J.C.A., Rohm Young, D., & Sallis, J.F. (2004). Comparison of two approaches to structured physical activity surveys for adolescents. *Medicine and Science in Sports and Exercise*, 36(12):2135-2143.

Welk, G.J., Schaben, J.A., & Shelley, M. (2004). Physical activity and physical fitness in children schooled at children attending public schools. *Pediatric Exercise Science*, 16(4): 310-323.

Eisenmann, J.C., Wickel, E.E.**Welk, G.J.**, & Blair, S.N. (2004). Stability of risk factors associated with the metabolic syndrome from adolescence into adulthood. *American Journal of Human Biology*, 16(6): 690-696.

Welk, G.J., Dzewaltowski, D.A., Ryan, G.J., Sepulveda-Jowers, E.M., & Hill, J.L. (2004). Convergent validity of the Previous Day Physical Activity Recall and the *ACTIVITYGRAM* Assessment. *Research Quarterly for Exercise and Sport*, 75(4): 370-380.

Welk, G.J., Morrow, J., & Schaben, J.A. (2004) Reliability of four accelerometry-based activity monitors: A generalizability study. *Medicine and Science in Sports and Exercise* 36(9), 1637-1645.

Welk, G.J., & Schaben, J. (2004). Psychosocial correlates of physical activity in children – A study of relationships when children have similar opportunities to be active. *Measurement in Exercise Science and Physical Education*, 8(2): 63-81.

Welk, G.J., Almeida, J., & Morss, G. (2003). Laboratory calibration and validation of the Biotrainer and Actitrac activity monitors. *Medicine and Science in Sports and Exercise*, 35, 1057-1064.

Welk, G.J.; Wood, K. & Morss, G. (2003). Parental influences on physical activity in children: An exploration of potential mechanisms. *Pediatric Exercise Science*, 15, 19-33.

Welk, G.J., Thompson, R.W. & Galper, D.I. (2001). A temporal validation of scoring algorithms for the 7-day physical activity recall. *Measurement in Exercise Science and Physical Education*, 5(3), 123-138.

Welk, G.J., Differding, J.A., Thompson, R.W., Blair, S.N., Dziura, J., & Hart, P. (2000). The utility of the Digi-Walker step counter to assess daily physical activity patterns. *Medicine and Science in Sports and Exercise*, 32(9), S481-S488.

Welk, G.J., Blair, S.N., Wood, K., Jones, S., & Thompson, K.W. (2000). A comparative evaluation of three accelerometry-based physical activity monitors. *Medicine and Science in Sports and Exercise*, 32(9), S489-S497.

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List of Recent Presentations

Gaesser, G.A., Clark, B.R., Parker, B.E. Jr., Olowin' A.B., Richardson' N.T., Blessinger, J.R., Sawyer, B.J., Davis, C.K., **Welk, G.J.**, Irving, B.A. (2006). Validation Of An Integrated Heart Rate/Physical Activity Monitor. American College of Sports Medicine (ACSM) annual meeting.

Welk, G.J., Trost, S.G., Schaben, J.A. (2005). Calibration of the Biotrainer Pro Activity Monitor in Youth using Receiver Operator Characteristic (ROC) Curves. American College of Sports Medicine (ACSM) annual meeting. Nashville, TN, June.

Eisenmann, J.C., Wickel, E.E., Ihmels, M.A. & **Welk, G.J.** (2005). Cardiovascular disease risk factors in youth. American College of Sports Medicine (ACSM) annual meeting. Nashville, TN, June.

Imhels, M.A., Eisenmann, J.C., **Welk, G.J.** (2005). Aerobic fitness, fatness and cardiovascular risk factors among Australian youth. American College of Sports Medicine (ACSM) annual meeting. Nashville, TN, June.

Schaben, J.A., & **Welk, G.J.** (2005). A comparison of physical activity levels and patterns between home and public school children. American College of Sports Medicine (ACSM) annual meeting. Nashville, TN, June.

Calabro, M.A., **Welk, G.J.**, Ihmels, M., & Cobby, R. (2005). Relationships between self-efficacy, perceived competence, and gross motor skills in children. American College of Sports Medicine (ACSM) annual meeting. Nashville, TN, June.

McClain, J.J., **Welk, G.J.**, Wickel, E.E., & Eisenmann, J.C. (2005). Accuracy of Energy Expenditure Estimates from the BodyMedia SenseWear® Pro 2 Armband. American College of Sports Medicine (ACSM) annual meeting. Nashville, TN, June.

Joens-Matre, R. **Welk, G.J.**, Calabro, M.A., Hensley, L., & Nicklay, E. (2005). Differences in Physical Activity and Physical Fitness in Children by Levels of Urbanization. American College of Sports Medicine (ACSM) annual meeting. Nashville, TN, June.

McClain, J., **Welk, G.J.**, Eisenmann, J.C., Wickel, E., Beier, S., & Flakoll, P. (2004). Convergent Validity of the MTI and BodyMedia Activity Monitors Against Energy

Expenditure Estimates from the IDEAA MonitorAccelerometer Conference. Chapel Hill, NC. December.

Ihmels, M., **Welk, G.J.**, & McClain, J.J. (2004). The Reliability and Convergent Validity of Field Tests of Body Composition in Children. American College of Sports Medicine (ACSM) annual meeting. San Fransisco, CA, June.

McClain, J.J., & **Welk, G.J.** (2004). Utility of a 15m Version of the PACER Aerobic Fitness Test in Children and Adolescents. American College of Sports Medicine (ACSM) annual meeting. San Fransisco, CA, June.

Schaben, J.A., Joens-Matre, R., Hensley, L.D. & **Welk, G.J.** (2004). The Predictive Utility of the Children's Physical Activity Correlates (CPAC) Scale Across Multiple Grade Levels. American College of Sports Medicine (ACSM) annual meeting. San Fransisco, CA, June.

Welk, G.J., McClain, J.J., Schaben, J.A., & Mahar, M.T. (2004). Method Agreement between Two Field Tests of Aerobic Fitness in Youth. American College of Sports Medicine (ACSM) annual meeting. Indianapolis, IN, June.

McMurray, R.G., Ring, K.B., Treuth, M.S., **Welk, G.J.**, Pate, R.R., Schmitz, M.K., Rohm-Young, D., Sallis, J.F. (2003). Comparison of two survey methods to obtain physical activity information for adolescents. North American Association for the Study of Obesity (NAASO) Annual Meeting.

Welk, G.J. (2003). Validity and Reliability of Various Field Tests of Fitness for Children. American College of Sports Medicine (ACSM) annual meeting. San Fransisco, CA, June. (Presented by Matt Mahar).

Schaben, J.A., & *Welk, G.J.* ***(2003). Physical Activity Correlates in Home School and Public School Children. American College of Sports Medicine (ACSM) annual meeting. San Fransisco, CA, June.***

Welk, G.J. & Schaben, J.A. (2003). Physical Fitness and Perceived Competence in Home School and Public School Children. American College of Sports Medicine (ACSM) annual meeting. San Fransisco, CA, June. (presented by J. Schaben)

Welk, G.J. ***(2002). Validation of the Biotrainer and Actitrac Activity Monitors for the Assessment of Physical Activity. American College of Sports Medicine (ACSM) annual meeting. St. Louis, MO, June.***

Schaben, J.A., & *Welk, G.J.* ***(2002). Predicting Activity Patterns When Children Have the Same Opportunity to be Physically Active. American College of Sports Medicine (ACSM) annual meeting. St. Louis, MO, June.***

Welk, G.J. ***(2002). Application of Direct Observation Techniques for the Calibration of Physical Activity Monitors in Children. American Alliance for Health, Physical Education, Recreation and Dance (AAHPERD) annual meeting, April.***

Welk, G.J. (2002). Reliability of the CSA Activity Monitor for Assessing Physical Activity. American Alliance for Health, Physical Education, Recreation and Dance (AAHPERD) annual meeting, April.

Welk, G.J., Dzewaltowski, D.A., Ryan, G.J., Sepulveda-Jowers, E.M., & Hill, J.L. (2001) Convergent validity of the Previous Day Physical Activity Recall and the ACTIVITYGRAM Assessment. American College of Sports Medicine National Meeting (Medicine and Science in Sports and Exercise, 33(5), S144.

Wood, K., **Welk, G.J.**, & Barlow, C.E. (2000) Characteristics and Adherence Patterns of Newly Enrolled Members of a Fitness Center. American College of Sports Medicine National Convention. Indianapolis, IN.

Differding, J., & **Welk, G.J.** (2000). Intra-individual variability in validity coefficients for two temporally matched activity measures. American College of Sports Medicine National Convention. Indianapolis, IN.

Morss, G., **Welk, G.J.**, & Pickering, M. (2000). Parental Attitudes Towards Physical Activity in Children: An Examination of the Expectancy- Values Model of Parental Socialization. American College of Sports Medicine National Convention. Indianapolis, IN

Welk, G.J., Wood, K., & Pickering, M. (2000). Parental influences on physical activity in children. American College of Sports Medicine National Convention. Indianapolis, IN.

Wood, G., Morss, G., Fernandez, J. Gill, D., & **Welk, G.J.** (2000). Variability and stability of physical activity patterns in children. AAHPERD National Convention. Orlando, Fl.

Welk, G.J., Wood, K., Sottovia, C., & Morss, G. (2000). Preliminary validation of the ACTIVITYGRAM physical activity assessment for children**.** AAHPERD National Convention. Orlando, Fl.

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Professional Outlets

FITNESSGRAM Youth Fitness Program

I currently serve as the Scientific Director of the *FITNESSGRAM* youth fitness program. *FITNESSGRAM* is a fitness assessment and promotion program used in physical education programs across the United States. It was developed by the Cooper Institute for Aerobics Research (http://www.cooperinst.org/) over 15 years ago and has been widely accepted among professionals in the field. We have recently released a network-based version of the software to facilitate its use in schools. The new software also includes an assessment physical activity called *ACTIVITYGRAM*. For additional information on the *FITNESSGRAM* program contact the American Fitness Alliance (http://www.americanfitness.net/) - a collaborative alliance between the Cooper Institute, Human Kinetics Publishers and the American Alliance for Health, Physical Education, Recreation and Dance.

An online manual (The *FITNESSGRAM* Reference Guide) is now available to answer technical questions about the *FITNESSGRAM* and *ACTIVITYGRAM* assessments and the overall philosophy of the *FITNESSGRAM* program.

Concepts of Fitness and Wellness Textbooks

I am a co-author of a series of books on fitness and wellness originally developed by Dr. Charles B. Corbin. The line of books originated with the publication of the *Concepts of Physical Fitness* text which is in its 10th edition. A more comprehensive book covering various fitness and wellness topics (*Concepts of Fitness and Wellness*) is currently being updated for the 4th edition and will be available in the Fall of 2001. The first edition of a book on the essential aspects of fitness (*Fundamental Concepts of Physical Fitness*) was recently released in the Fall of 2000. More information on the books and the related web-based ancillaries is available from the McGraw Hill Web page for the book (http://www.mhhe.com/hper/physed/clw/).