

Editorial

Update on Acceptance and Backlog (p. iv)
Mark G. Fischman

Epidemiology

Descriptive Epidemiology of Dance Participation in Adolescents (pp. 373–380)
Jennifer R. O'Neill, Russell R. Pate, and Angela D. Liese

The aims of this study were to describe the prevalence of dance participation in U.S. adolescents and to estimate the contribution of dance to total moderate-to-vigorous physical activity (MVPA). The sample was composed of 3,598 adolescents from the 2003–06 National Health and Nutrition Examination Survey. Youth reported frequency and duration of physical activities performed in the past month. Dance participation prevalence was calculated; among those who reported dance, its contribution to total MVPA was estimated. The prevalence of dance was much higher in girls (34.8%) than boys (8.4%). Girls had a greater contribution of dance to total MVPA (39.3%) than boys (23.0%). Dance is a prevalent form of physical activity among girls, and it accounts for a substantial fraction of their total MVPA.

Measurement and Evaluation

Differential Item Functioning Analysis of the 2003–04 NHANES Physical Activity Questionnaire (pp. 381–390)
Yong Gao and Weimo Zhu

Using differential item functioning (DIF) analyses, this study examined whether there were any DIF items in the National Health and Nutrition Examination Survey (NHANES) physical activity (PA) questionnaire. A subset of adult data from the 2003–04 NHANES study ($n = 3,083$) was used. PA items related to respondents' occupational, transportation, domestic, leisure-time, strength-related, and sedentary activities were analyzed for DIF using Mantel-Haenszel, SIBTEST, and analysis of variance procedures. Some items were identified as DIF items, with the majority of those items favoring advantaged social groups. For example, items about domestic activity and moderate-intensity leisure-time activity were DIF items favoring non-Hispanic Whites, and persons with higher levels of education (e.g., some college or more) or income (e.g., annual family income [AFI] $> \$34,999$). The vigorous activity item was a DIF item favoring younger adults (ages 20–59 years) and persons with higher levels of education or income. Occupational PA presented DIF favoring Hispanics and persons with lower levels of education (e.g., high school or less), and the transportation-related PA item presented DIF favoring persons with lower incomes (e.g., AFI $\leq \$34,999$). These findings highlight the importance of conducting DIF analysis in PA survey construction and emphasize the need to introduce DIF concepts and methods to PA researchers.

Correction Equations to Adjust Self-Reported Height and Weight for Obesity Estimates Among College Students (pp. 391–399)
Arupendra Mozumdar and Gary Liguori

The purposes of this study were to generate correction equations for self-reported height and weight quartiles and to test the accuracy of the body mass index (BMI) classification based on corrected self-

reported height and weight among 739 male and 434 female college students. The BMI_{qc} (from height and weight quartile-specific, corrected self-reported measurements) provided a more accurate estimation of BMI classification than BMI_c (from corrected self-reported measurements) and BMIs (from self-reported measurements) by showing a greater ability to predict cases with either a high or a low BMI category while still maintaining a high specificity. However, the equations are applicable only to Caucasian college student populations, so cross-validation in similar populations is needed before they are used more broadly.

A New Time Measurement Method Using a High-End Global Navigation Satellite System to Analyze Alpine Skiing (pp. 400–411)

Matej Supej and Hans-Christer Holmberg

Accurate time measurement is essential to temporal analysis in sport. This study aimed to (a) develop a new method for time computation from surveyed trajectories using a high-end global navigation satellite system (GNSS), (b) validate its precision by comparing GNSS with photocells, and (c) examine whether gate-to-gate times can provide more detailed information about alpine skiing performance. The results demonstrated small mean time differences with no systematic bias, with a velocity dependent scatter of time differences, which diminished at higher velocities. Furthermore, the multiple gate-to-gate and lag times demonstrated that the GNSS enabled a more detailed analysis compared to photocells. The measurements using GNSS showed high validity and potential as a tool for more specific analysis of performance in skiing.

Sample Size and Power Estimates for a Confirmatory Factor Analytic Model in Exercise and Sport: A Monte Carlo Approach (pp. 412–423)

Nicholas D. Myers, Soyeon Ahn, and Ying Jin

Monte Carlo methods can be used in data analytic situations (e.g., validity studies) to make decisions about sample size and to estimate power. The purpose of using Monte Carlo methods in a validity study is to improve the methodological approach within a study where the primary focus is on construct validity issues and not on advancing statistical theory. The purpose of this study is to demonstrate how Monte Carlo methods can be used to determine sample size and to estimate power for a confirmatory factor analytic model under model-data conditions commonly encountered in exercise and sport. Because the purpose is pursued by way of demonstration with the Coaching Efficacy Scale II–High School Teams, related sample size recommendations are provided: $N \geq 200$ for the theoretical model; $N \geq 300$ for the population model. Technical terms (e.g., coverage) are defined when necessary.

Concurrent Validity of the Polar s3 Stride Sensor for Measuring Walking Stride Velocity (pp. 424–430)

Nicole Grigg, James Smeathers, and Scott Wearing

With this research, we sought to establish the accuracy of stride velocity data collected by the s3 Stride Sensor. Participants walked along a GAITRite mat at self-selected slow, preferred, and fast velocities, with two s3 Stride Sensors attached to their right foot. The start position was systematically varied such that the GAITRite system would record the second through sixth strides at each walking velocity. Both slow and preferred walking velocities were underestimated by 14% relative to the GAITRite ($p < .05$), while independent of walking velocity, Strides 2 and 3 were underestimated by 26% and 9% ($p < .05$), respectively. Researchers should use caution when interpreting data collected at slow and preferred walking velocities and during the first three strides.

Motor Behavior

Internal and External Focus of Attention in a Novice Form Sport (pp. 431–441)

Gavin P. Lawrence, Vicky M. Gottwald, James Hardy, and Michael A. Khan

In the current experiment, we examined optimal focus for novices during a movement sequence in which performance was measured on accurate movement form/technique. A novel gymnastics routine was practiced under either an internal skill-relevant, internal skill-irrelevant, external, or no attention focus. Retention and transfer tests were then completed. During acquisition, adopting an internal irrelevant focus significantly improved performance, whereas an external focus degraded performance. There were no significant group differences in the retention and transfer tests. This suggests that learning of movement form/technique did not benefit from a specific focus of attention. The results are interpreted via an attentional capacity viewpoint and the notion that form tasks do not always contain obvious movement effects central to common coding and the constrained action hypothesis.

The Relationship Between Motor Skill Proficiency and Body Mass Index in Preschool Children (pp. 442–448)

Samuel W. Logan, Kristin Scrabis-Fletcher, Christopher Modlesky, and Nancy Getchell

The purpose of this study was to examine the relationship between motor proficiency and body mass index (BMI) in preschool children. Thirty-eight children ages 4–6 years had their BMI calculated and were assessed using the Movement Assessment Battery for Children-2 (MABC-2; Henderson, Sugden, & Barnett, 2007). These data were analyzed in two ways. The correlation between BMI and MABC-2 percentile ranks was calculated. Next, the groups were subdivided based on BMI status (high, $M = 85.5$; medium, $M = 49.8$; low, $M = 10.8$), and compared using t tests to determine if differences existed in MABC-2 percentile ranks. No significant relationship existed between MABC-2 and BMI percentile ranks ($r = -.237$). However, significant differences in MABC-2 percentile ranks existed between high and low ($p = .042$), and high and medium ($p = .043$) groups. These results suggest that preschool children classified as overweight or obese may have lower motor proficiency than their normal weight and underweight peers. This study indicates there is a direct relationship between motor proficiency and BMI in the preschool population.

Allowing Learners to Choose: Self-Controlled Practice Schedules for Learning Multiple Movement Patterns (pp. 449–457)

Will F. W. Wu and Richard A. Magill

For this study, we investigated the effects of self-controlled practice on learning multiple motor skills. Thirty participants were randomly assigned to self-control or yoked conditions. Participants learned a three-keystroke pattern with three different relative time structures. Those in the self-control group chose one of three relative time structures before each of 90 practice trials; yoked participants were not allowed to choose but were yoked to a self-control participant and followed that individual's sequence of practice trials. Results of the 24-hr serial transfer test revealed the self-control group exhibited significantly lower relative timing error, absolute error, and total error than the yoked group. Findings further support the efficacy of self-controlled learning.

Effects of Training on the Estimation of Muscular Moment in Submaximal Exercise (pp. 458–465)

Celine Leverrier, Antoine Gauthier, Arnaud Nicolas, and Corinne Molinaro

The purpose of this study was to observe the effects of a submaximal isometric training program on estimation capacity at 25, 50, and 75% of maximal contraction in isometric action and at two angular

velocities. The second purpose was to study the variability of isometric action. To achieve these purposes, participants carried out an isokinetic extension movement of the dominant lower limb during six test sessions and nine training sessions. Following the training program, estimation capacity in the different actions did not improve. However, an improvement in performance was observed with a reduction in the variability of submaximal isometric actions. The proprioceptors activated in isometric action seemed to adapt to the training program itself, which would promote better adaptation by a greater solicitation of internal feedback.

Instructions to Adopt an External Focus Enhance Muscular Endurance (pp. 466–473)
David C. Marchant, Matt Greig, Jonathan Bullough, and Daniel Hitchen

The influence of internal (movement focus) and external (outcome focus) attentional-focusing instructions on muscular endurance were investigated using three exercise protocols with experienced exercisers. Twenty-three participants completed a maximal repetition, assisted bench-press test on a Smith's machine. An external focus of attention resulted in significant ($p < .05$) improvements in performance compared to the internal focus of attention, but not the control condition. Seventeen participants completed repetitions to failure at 75% 1-RM on free bench-press and squat exercises. In both tasks, externally focused instructions resulted in significantly greater repetitions to failure than control and internal focus conditions ($p < .05$). These results support previous research showing beneficial effects of externally focused instructions on movement efficiency.

Self-Controlled Amount of Practice Benefits Learning of a Motor Skill (pp. 474–481)
Phillip G. Post, Jeffrey T. Fairbrother, and Joao A. C. Barros

Self-control over factors involving task-related information (e.g., feedback) can enhance motor learning. It is unknown if these benefits extend to manipulations that do not directly affect such information. The purpose of this study was to determine if self-control over the amount of practice would also facilitate learning. Participants learned to throw a dart using their nonpreferred hand. The self-control (SC) group decided when to stop practice. The yoked group completed the same number of trials as their SC counterparts. Results revealed the SC group was more accurate during transfer and in recalling the number of trials completed. These findings indicate that self-control benefits extend to factors that do not directly alter task-related information.

Pedagogy

Student Teachers' Use of Instructional Choice in Physical Education (pp. 482–490)
Ping Xiang, Zan Gao, and Ron E. McBride

Guided by self-determination theory and research on teacher beliefs, we examined student teachers' (STs) use of instructional choices in teaching physical education classes. Participants included 131 STs (52 men and 79 women) from a major university in the United States. STs completed questionnaires assessing three types of instructional choices (cognitive, organizational, and procedural) they provided and their rationale for providing their students with choices. The STs reported they gave students cognitive, organizational, and procedural choices. They firmly believed instructional choice promotes students' motivation, autonomy, and engagement in physical education. They also believed teachers should consider factors such as student characteristics and the beneficial effects when implementing choice in their classes.

Physical Activity Correlates for Children With Autism Spectrum Disorders in Middle School Physical Education (pp. 491–498)

Chien-Yu Pan, Chia-Liang Tsai, and Kai-Wen Hsieh

This study examined potential correlates that might influence physical activity (PA) of adolescents with autism spectrum disorders (ASD) in physical education. Students with ($n = 19$) and without ($n = 76$) ASD wore an accelerometer during physical education. Data were collected in 38 physical education lessons. The results showed that (a) students with ASD were less physically active than their peers, (b) their PA was related positively to their social interaction with peers, and (c) their moderate to vigorous PA depended on PA content, physical environment, and instructor-related characteristics. The findings suggest a need for additional studies on the relationship between the needs of adolescents with ASD and the content offered in physical education so as to inform school policies and help to remove barriers to promoting PA among this population.

Implementation Fidelity of a Program Designed to Promote Personal and Social Responsibility Through Physical Education: A Comparative Case Study (pp. 499–511)

Carmina Pascual, Amparo Escartí, Ramon Llopis, Melchor Gutiérrez,
Diana Marín, and Paul M. Wright

The purpose of this qualitative comparative case study was to examine the implementation fidelity of a program designed to deliver the Teaching Personal and Social Responsibility (TPSR) model (Hellison, 2003) through physical education and its relationship with short-term outcomes for elementary school students. The research questions were: (a) was the program implemented with fidelity, and (b) did better fidelity yield better student outcomes. Thus, we conducted a study on the implementation process used by two teachers who delivered the same program in two physical education classes in two different elementary schools in Spain. Data sources included observations and interviews with teachers and nonparticipant observers. Findings indicated that fidelity of implementation in Case 1 was higher and most children in those classes acquired the first three of five TPSR responsibility levels. Implementation fidelity in Case 2 was weaker and achievement of responsibility goals was minimal (only the first of five levels) and less stable for those students. This study is the first to directly examine the connection between TPSR implementation fidelity and student outcomes.

The Influence of Physical Education on Physical Activity Levels of Urban Elementary Students (pp. 512–520)

Brian D. Dauenhauer and Xiaofen D. Keating

The purpose of this study was to examine the role of physical education in shaping physical activity patterns. Seventy-one Hispanic and African American elementary students participated in the study. Students attended one 30- and one 60-min physical education class weekly. Pedometer steps were used to estimate physical activity. Data suggest that students did not engage in enough physical activity on a daily basis to incur health benefits. There were significant step differences in 0-, 30-, and 60-min physical education days, with the most steps occurring on 60-min days. Results from the study suggest physical education may be an important source of physical activity for Hispanic and African American students, especially girls, and may influence participation in physical activity outside of class.

Psychology

The Effects of Physical Activity and Physical Fitness on Children's Achievement and Cognitive Outcomes: A Meta-Analysis (pp. 521–535)

Alicia L. Fedewa and Soyeon Ahn

It is common knowledge that physical activity leads to numerous health and psychological benefits. However, the relationship between children's physical activity and academic achievement has been debated in the literature. Some studies have found strong, positive relationships between physical activity and cognitive outcomes, while other studies have reported small, negative associations. This study was a comprehensive, quantitative synthesis of the literature, using a total of 59 studies from 1947 to 2009 for analysis. Results indicated a significant and positive effect of physical activity on children's achievement and cognitive outcomes, with aerobic exercise having the greatest effect. A number of moderator variables were also found to play a significant role in this relationship. Findings are discussed in light of improving children's academic performance and changing school-based policy.

Effects of Curricular Activity on Students' Situational Motivation and Physical Activity Levels (pp. 536–544)

Zan Gao, James C. Hannon, Maria Newton, and Chaoqun Huang

The purpose of this study was to examine (a) the effects of three curricular activities on students' situational motivation (intrinsic motivation [IM], identified regulation [IR], external regulation, and amotivation [AM]) and physical activity (PA) levels, and (b) the predictive strength of situational motivation to PA levels. Four hundred twelve students in grades 7–9 participated in three activities (cardiovascular fitness, ultimate football, and Dance Dance Revolution [DDR]) in physical education. ActiGraph GT1M accelerometers were used to measure students' PA levels for three classes for each activity. Students also completed a Situational Motivation Scale (Guay, Vallerand, & Blanchard, 2000) at the end of each class. Multivariate analysis of variance revealed that students spent significantly higher percentages of time in moderate-to-vigorous PA (MVPA) in fitness and football classes than they did in DDR class. Students reported higher IM and IR toward fitness than DDR. They also scored higher in IR toward fitness than football. In contrast, students displayed significantly lower AM toward fitness than football and DDR. Hierarchical Linear Modeling revealed that IM was the only positive predictor for time in MVPA ($p = .02$), whereas AM was the negative predictor ($p < .01$). The findings are discussed in regard to the implications for educational practice.

Comparison of the Validity of Four Fall-Related Psychological Measures in a Community-Based Falls Risk Screening (pp. 545–554)

Delilah S. Moore, Rebecca Ellis, Maria Kosma, Jennifer M. Fabre, Kevin S. McCarter, and Robert H. Wood

We examined the measurement properties of fall-related psychological instruments with a sample of 133 older adults (M age = 74.4 years, $SD = 9.4$). Measures included the Comprehensive Falls Risk Screening Instrument, Falls-efficacy Scale-International (FES-I), Activities-specific Balance Confidence (ABC), modified Survey of Activities and Fear of Falling in the Elderly (mSAFFE), Consequences of Falling (CoF), Physical Activity Scale for the Elderly (PASE), and 36-Item Short-Form Health Survey (SF-36). The FES-I, ABC, mSAFFE, and CoF were significantly correlated with each other, with SF-36, and with mobility. The ABC and mSAFFE were significantly correlated with PASE. The ABC differentiated between fallers and nonfallers and predicted total falls risk. Findings can assist with the selection of psychological instruments in a falls risk screening context.

The Functional Equivalence Between Movement Imagery, Observation, and Execution Influences Imagery Ability (pp. 555–564)

Sarah E. Williams, Jennifer Cumming, and Martin G. Edwards

Based on literature identifying movement imagery, observation, and execution to elicit similar areas of neural activity, research has demonstrated that movement imagery and observation successfully prime movement execution. To investigate whether movement and observation could prime ease of imaging from an external visual-imagery perspective, an internal visual-imagery perspective, and kinesthetic modality, 36 participants (M age = 20.58; SD = 3.11; 18 women and 18 men) completed an adapted version of the Movement Imagery Questionnaire-Revised under four modes of delivery (movement prime, external observation prime, internal observation prime, and image-only). The results revealed that ease of imaging was significantly greater during the movement and observation prime conditions compared to the image-only condition ($p < .05$). Specifically when priming external visual imagery and internal visual imagery, observation facilitated ease of imaging only when the perspective was congruent with the imagery perspective. The results support the use of movement and observation to facilitate ease of imaging, but highlight the importance of considering the visual perspective when using observation.

Research Notes

Objectively Assessed Physical Activity Among Tongans in the United States (pp. 565–569)

Timothy K. Behrens, Karen Moy, Mary K. Dinger, Daniel P. Williams, and Vanessa J. Harbour

No Relative Age Effect in the Birth Dates of Award-Winning Athletes in Male Professional Team Sports (pp. 570–573)

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Pamela Hodges Kulinna, NathanMcCaughtry, Jeffrey Martin, and Donetta Cothran

Effect of Exercise Training on Hippocampal Volume in Humans: A Pilot Study (pp. 585–591)

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Commentary

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