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Biomechanics

Sit-to-Stand Performance of Older Adults Following Strength Training (pp. 1–8)

Philip K. Schot, Kathleen M. Knutzen, Susan M. Poole, and Leigh A. Mrotek

A group of healthy older adults completed an 8-week resistance-training program. For 38 participants (14 men, 24 women; ages 60–90 years; M mass = 73.2 kg, SD = 12.3; M height = 1.65 m, SD = 0.08), pre- and postprogram sit-to-stand performance was analyzed (60 Hz video) focusing on center of mass kinematics surrounding transition. Significant changes were attributed to improved strength. Peak forward, downward, and upward velocities increased (16, 59, and 26%, respectively), and relative transition time was delayed 27%. These behaviors were more similar to those of healthy younger adults. Results also indicated strategy changes. Participants exploited their improved strength, forming a distinctive movement pattern emphasizing stability followed by a brisk rise. These adaptations represent meaningfully improved function in an important daily living activity.

Biomechanical Consequences of Impairment: A Taxonomically Valid Basis for Classification in a Unified Disability Athletics System (pp. 9–16)

Sean M. Tweedy

Developing a unified classification system to replace four of the systems currently used in disability athletics (i.e., track and field) has been widely advocated. The diverse impairments to be included in a unified system require several assessment methods, results of which cannot be meaningfully compared. Therefore, the taxonomic basis of current classification systems is invalid in a unified system. Biomechanical analysis establishes that force, a vector described in terms of magnitude and direction, is a key determinant of success in all athletic disciplines. It is posited that all impairments to be included in a unified system may be classified as either force magnitude impairments (FMI) or force control impairments (FCI). This framework would provide a valid taxonomic basis for a unified system, creating the opportunity to decrease the number of classes and enhance the viability of disability athletics.

Motor Control and Learning

The End-State Comfort Effect in Bimanual Grip Selection (pp. 17–24)

Mark G. Fischman, David F. Stodden, and Davana M. Lehman

During a unimanual grip selection task in which people pick up a lightweight dowel and place one end against targets at variable heights, the choice of hand grip (overhand vs. underhand) typically depends on the perception of how comfortable the arm will be at the end of the movement: an end-state comfort effect. The two experiments reported here extend this work to bimanual tasks. In each experiment, 26 right-handed participants used their left and right hands to simultaneously pick up two wooden dowels and place either the right or left end against a series of 14 targets ranging from 14 to 210 cm above the floor. These tasks were performed in systematic ascending and descending orders in Experiment 1 and in random order in Experiment 2. Results were generally consistent with predictions of end-state comfort in that, for the extreme highest and lowest targets, participants tended to select opposite grips with each hand. Taken together, our findings are consistent with the concept of constraint hierarchies within a posture-based motion-planning model.

Pedagogy

Children's Motivation in Elementary Physical Education: An Expectancy-Value Model of Achievement Choice (pp. 25–35)

Ping Xiang, Ron McBride, Jianmin Guan, and Melinda Solmon

This study examined children's motivation in elementary physical education within an expectancy-value model developed by Eccles and her colleagues. Four hundred fourteen students in second and fourth grades completed questionnaires assessing their expectancy-related beliefs, subjective task values, and intention for future participation in physical education. Results indicated that expectancy-related beliefs and subjective task values were clearly distinguishable from one another across physical education and throwing. The two constructs were related to each other positively. Children's intention for future participation in physical education was positively associated with their subjective task values and/or expectancy-related beliefs. Younger children had higher motivation for learning in physical education than older children. Gender differences emerged, and the findings provided empirical evidence supporting the validity of the expectancy-value model in elementary physical education.

Influence of a Motor Skill Intervention on Fundamental Motor Skill Development of Disadvantaged Preschool Children (pp. 36–46)

Jaqueline D. Goodway and Crystal F. Branta

The influence of a 12-week (24, 45-min motor sessions) motor skill intervention on fundamental motor skill (FMS) development of disadvantaged preschoolers was examined. Pre- and postintervention measures of the object control (OC) and locomotor subscales of the Test of Gross Motor Development were obtained for both groups. Prior to the intervention, developmental delays in FMS were reported. Two separate 2 x 2 (Group x Pre-Postintervention) analyses of variance with repeated measures yielded a significant Group x Pre-Postintervention interaction for locomotor, $F(1, 57) = 134.23$, $p = .000$, $h^2 = .70$, and OC, $F(1, 57) = 161.55$, $p = .000$, $h^2 = .74$ skills. Compared to the Control group, the motor skill intervention group revealed significantly higher locomotor and OC scores following the intervention than prior to the intervention.

Physiology

Chronic Flexibility Gains: Effect of Isometric Contraction Duration During Proprioceptive Neuromuscular Facilitation Stretching Techniques (pp. 47–51)

Ann V. Rowlands, Vicky F. Marginson, and Jonathan Lee

The aim of this study was to assess the effect of two isometric contraction durations during proprioceptive neuromuscular facilitation stretching on gains in flexion at the hip. Forty-three women (M age = 20.0 years, SD = 1.3) were assigned to one of three groups: 5-s isometric contraction (5-IC), 10-IC, and control. Flexibility was assessed at baseline and Weeks 3 and 6. Analysis of covariance, controlling for pretest differences, showed a significant interaction, $F(2, 33) = 44.1$, $p < .001$. Flexibility was significantly lower in the control group relative to the 5-IC and 10-IC groups and in the 5-IC group relative to the 10-IC group at 3 and 6 weeks (3 weeks = $101.2 \pm 1.4^\circ$, $114.3 \pm 1.5^\circ$, $120.5 \pm 1.3^\circ$; 6 weeks = $103.0 \pm 1.4^\circ$, $126.1 \pm 1.6^\circ$, $133.3 \pm 1.4^\circ$ for control, 5-IC and 10-IC groups, respectively). A longer contraction time led to greater increases in flexibility.

Training College-Age Women to Perform the Pull-up Exercise (pp. 52–59)

S. P. Flanagan, P. M. Vanderburgh, S. G. Borchers, and C. D. Kohstall

The purpose of this investigation was to determine the effect of a combined strength and aerobic conditioning program on the ability of college-age women to perform the pull-up exercise and to identify the characteristics of women successful in performing a pull-up at the end of the program. Participants significantly increased upper body strength and fat-free mass and decreased fat mass and percentage of body fat. Participants successful at performing a pull-up had significantly greater 1 repetition maximum strength, strength to mass ratio, and strength to fat-free mass ratio. A two variable equation (% body fat and strength to fat-free mass ratio) was developed to predict which women would be successful at completing a pull-up at the end of a similar training program.

Psychology

Reflected Appraisals and Perceived Importance of Significant Others' Appraisals as Predictors of College Athletes' Self-Perceptions of Competence (pp. 60–70)

Anthony J. Amorose

This study examined the reflected appraisal process with college athletes ($N = 325$). Specifically, the study tested: (a) the relative influence of the reflected appraisals of mothers, fathers, coaches, and teammates (i.e., how athletes perceive these others view their ability) on athletes' self-perceptions of competence, and (b) whether the importance placed on these significant others as sources of competence information moderated the relationship. Based on a factor analysis, composite variables were formed representing the reflected appraisals of the athletes' parents (i.e., father, mother) and the reflected appraisals of sport-others (i.e., coach, teammates). Regression analyses revealed that the reflected appraisals of parents ($b = .21$) and sport-others ($b = .55$) predicted self-perceptions of competence ($p < .05$, $R^2 = .45$). Follow-up analyses determined that the reflected appraisal of sport-others was a significantly stronger predictor. Hierarchical regression analyses revealed that the interaction of reflected appraisals and the importance of significant others did not significantly add to the prediction of self-perceptions of competence ($p > .05$, $\Delta R^2 = .01$) beyond the independent effects of these constructs. Results are discussed in terms of the reflected appraisal process and the influence of significant others on athletes' self-perceptions.

Structure of Expert Players' Activity During Competitive Interaction in Table Tennis (pp. 71–83)
Carole Sève, Jaques Saury, Luc Ria, and Marc Durand

This study analyzed the activity of expert table tennis players during a match, in reference to course of action theory (Theureau, 1992). Matches were videotaped, and the players' verbalizations as they viewed the tapes were collected a posteriori. The data was analyzed by (a) transcribing the players' actions and verbalizations, (b) decomposing their activity into elementary units of meaning, and (c) grouping the elementary units into larger sets. The results showed that the matches began with an inquiry into the specific features of the opponent's play. This was followed by reproducing the actions identified as effective during the inquiry. The results are discussed in relation to the role of training in expert performance.

Sociology and Cultural Anthropology

Experiences of Sexual Harassment and Abuse Among Norwegian Elite Female Athletes and Nonathletes (pp. 84–97)
Kari Fasting, Celia Brackenridge, and Jorunn Sundgot-Borgen

This paper compares the prevalence of sexual harassment and abuse among 660 Norwegian elite female athletes and an age-matched control sample of nonathletes. It also explores differences in the prevalence of harassment and abuse in sport and work or school settings and compares harassment and abuse perpetrated by male authority figures and peers in these different contexts. No differences were found between the athletes and controls in overall prevalence of sexual harassment or abuse. However, the athletes experienced significantly more harassment from male authority figures than did the controls. Based on these results, the article considers whether or not sport offers women any particular immunity from sexual harassment and abuse. The implications of the findings for structural and cultural change in sport are discussed.

Research Notes

Training Perceptual Skill in Field Hockey: Is There Transfer From the Laboratory to the Field? (pp. 98–103)
A. Mark Williams, Paul Ward, and Ceri Chapman

Effect of Manual Guidance on Acquiring a New Bimanual Coordination Pattern (pp. 104–109)
Seijiro Tsutsui and Kuniyasu Imanaka

Predicting Maximum Oxygen Uptake From a Modified 3-Minute Step Test (pp. 110–115)
Antonio Saraiva Santo and Lawrence A. Golding