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Editorial

Analyzing Data From Field Research: The Unit of Analysis Issue (pp. iii–iv)
Stephen Silverman

Epidemiology

Personal and Clinical Exercise-Related Attitudes and Behaviors of Freshmen U.S. Medical Students (pp. 112–121)
Erica Frank, Deborah A. Galuska, Lisa K. Elon, and Elsa H. Wright

To determine personal and clinical exercise-related attitudes and behaviors of freshmen U.S. medical students, we surveyed 1,906 entering freshman medical students (response rate = 87%; average age = 24 years) in 17 U.S. medical schools. Students reported a median of 45 min/day of exercise, 80 min/week each of mild and moderate exercise, and 100 min/week of strenuous exercise. Nearly all students (97.6%) engaged in some moderate or vigorous exercise in a typical week. Sixty-four percent complied with U.S. Department of Health and Human Services exercise recommendations. Most freshmen (79%) believed it would be highly relevant to their future practices to counsel patients about exercise; predictors included intention to provide primary care, excellent health, prevention emphasis by their personal physician, and performing more strenuous exercise.

Promoting Physical Activity Among Sedentary Women Using Pedometers (pp. 122–129)
Cara L. Sidman, Charles B. Corbin, and Guy Le Masurier

Sedentary women ($n = 92$) classified as low (L), medium (M), and high (H) in baseline step counts and assigned to 10,000-step goal (TSG) and personal step goal (PSG) groups (within levels) were compared on goal attainment and step counts. A significant interaction for goal attainment, $F(2, 86) = 4.51$, $p = .014$, indicated that the L group was significantly less likely to meet the TSG than the M and H groups. Step counts increased after goal assignment, but not more for one group than the other. Results of this research support the previous finding that women with low baseline step counts are unlikely to meet a TSG, but a TSG does not result in lower step counts than a PSG.

Motor Control and Learning

Object Rotation Effects on the Timing of a Hitting Action (pp. 130–137)
Mark A. Scott, John van der Kamp, Geert J. P. Savelsbergh, Raoul R. D. Oudejans,
and Keith Davids

We investigated how perturbing optical information affects the guidance of an unfolding hitting action. Using monocular and binocular vision, six participants were required to hit a rectangular foam object, released from two different heights, under four different approach conditions, two with object rotation (to perturb the viewed surface area) and two without. Participants made more misses under monocular conditions, and the presence of rotation had a significant effect on the duration between the arm's peak velocity and its contact with the object. We conclude that binocular information contributes to the timing of interceptive tasks. In addition, the guidance of interceptive actions does not appear to be based solely on object expansion information picked up from the viewed surface area.

Practice Changes the Usage of Moment Components in Executing a Multijoint Task (pp. 138–147)
Koji Kadota, Tomoyuki Matsuo, Ken Hashizume, Kazushi Tezuka

We examined changes in the usage of muscular and motion-dependent moments during the long-term practice of a complex, multijoint movement. Seven participants practiced a cyclic movement of the upper limbs until their joint angular movements conformed to those of an expert. The motions of the participants were digitally recorded using four high-speed infrared cameras, and the joint kinematics and kinetics of the right arm were calculated. Practice brought about changes in the patterns of the net joint moment and in the contributions of the muscular and motion-dependent moments to the net moments. Practice also brought about a growing opposition between the directions of the two moments. These changes seemed to be important for improving the dynamic equilibrium of the movements.

Distribution of Practice and Metacognition in Learning and Long-Term Retention of a Discrete Motor Task (pp. 148–155)
Teresa K. Dail and Robert W. Christina

This study examined judgments of learning and the long-term retention of a discrete motor task (golf putting) as a function of practice distribution. The results indicated that participants in the distributed practice group performed more proficiently than those in the massed practice group during both acquisition and retention phases. No significant differences in retention performance were found as a function of three retention intervals (1, 7, and 28 days). Echoing actual acquisition scores, participants in the distributed practice group predicted more proficient retention performance than did those in the massed practice group. Although all participants predicted more proficient performance than was actually achieved, the difference between predicted and actual performance failed to reach significance.

Pedagogy

Value Orientations of Elementary and Secondary Physical Education Teachers in Flanders (pp. 156–164)

Daniël Behets and Lieven Vergauwen

The purpose of this research was to examine and compare physical educators' value profiles. The Value Orientation Inventory was used to collect data from 528 elementary and 637 secondary physical education teachers in Flanders. Teacher characteristics, including gender and years of teaching experience revealed only minor differences in value orientations. Significant differences in teachers' value orientations were observed between teachers in elementary and secondary schools. The different value profiles of these two teacher groups are discussed in the perspective of the recently introduced conceptual innovations in physical education mandated by the Flemish government. The teachers at the elementary level placed a high priority on the disciplinary mastery and the self-actualization orientations; those at the secondary level scored high on the social responsibility and disciplinary mastery orientations. The findings from this study suggest that teaching level influences teachers' value orientation. Teachers appeared to adjust their curricular priorities to meet the demands and needs of students in elementary versus secondary schools.

Psychology

Effect of Acute 60 and 80% VO₂max Bouts of Aerobic Exercise on State Anxiety in Women of Different Age Groups Across Time (pp. 165–175)

Richard H. Cox, Tom R. Thomas, Pam S. Hinton, and Owen M. Donahue

The purpose of this investigation was to study the effects of an acute bout of aerobic exercise on state anxiety of women while controlling for iron status (hemoglobin and serum ferritin). Participants were 24 active women, ages 18–20 years ($n = 12$) and 35–45 years ($n = 12$). In addition to a nonexercise control condition, participants completed one exercise bout at 60% maximal oxygen uptake (VO₂max) and one at 80% VO₂max. Each exercise session consisted of a 33-min bout in which participants exercised at their target intensities for a 20-min segment. Immediately before each exercise trial, participants were given the Spielberger State Anxiety Inventory (SAI). The SAI was again administered immediately following the exercise session and at 30, 60, and 90 min postexercise. Data were analyzed using an Age x Intensity x Time (2 x 3 x 5) repeated measures analysis of covariance (ANCOVA) with iron status serving as the covariate. The ANCOVA on state anxiety yielded significant effects for time ($p < .0001$, $h_2p = .48$), the Intensity x Time interaction ($p = .0006$, $h_2p = .19$), and the Intensity x Age interaction ($p = .04$, $h_2p = .15$). All three exercise conditions (including control) showed a decline in state anxiety across time, but the 80% VO₂max condition showed a sharper decline. Intensity of exercise conditions did not differ in state anxiety at baseline or immediately after exercise, but a difference favoring the 80% VO₂max condition over the control condition emerged at 30 min postexercise. After controlling for iron status, older women who exercised at 80% VO₂max exhibited lower SAI scores compared to the control condition.

Physical Activity and Executive Control: Implications for Increased Cognitive Health During Older Adulthood (pp. 176–185)

Charles H. Hillman, Artem V. Belopolsky, Erin M. Snook, Arthur F. Kramer, and Edward McAuley

Electrocortical and behavioral responses of low, moderate, and high physically active older adults were compared with a younger control group on neutral and incompatible conditions of a flankers task. Compared to younger adults, high and moderate active older adults exhibited increased event-related potentials component P3 amplitude for the incompatible condition at the frontal electrode site. For the neutral condition, only low active older adults exhibited decreased amplitude at the central-parietal site, compared to younger adults. P3 latency revealed the longest latencies for low active older adults, followed by moderate active, high active, and younger adults, respectively. Reaction time (RT) data revealed that younger adults exhibited faster RT compared to all three older groups. Results

suggest that physical activity may improve executive control function in older adults by affecting the distribution of P3 amplitude, which has been related to memory and attentional processes, and by decreasing P3 latency, which relates to the speed of cognitive processing.

Self-Efficacy and the Stages and Processes of Change Associated With Adopting and Maintaining Muscular Fitness-Promoting Behaviors (pp. 186–196)

Bradley J. Cardinal and Maria Kosma

The majority of physical activity initiatives have been directed toward promoting cardiorespiratory fitness and general health. Far less attention has been devoted to encouraging or understanding muscular fitness-promoting behaviors. The purpose of this study was to determine if constructs from the Transtheoretical Model, a contemporary behavior change framework, could be adapted and applied to the study of muscular fitness-promoting behaviors. Participants were 429 college students who completed measures of stage of change, the behavioral and cognitive processes of change, and self-efficacy. All measures were modified to relate specifically to muscular fitness-promoting behaviors. Two direct discriminant function analyses were performed, revealing that the behavioral processes of change and self-efficacy were the major correlates of the stages of change for muscular fitness-promoting behaviors.

Research Notes

Random Practice Can Facilitate the Learning of Tasks That Have Different Relative Time Structures (pp. 197–202)

Curt E. Magnuson and David L. Wright

Movement Time Modulates Spatial Assimilation Effects in Rapid Bimanual Movements (pp. 203–208)

David E. Sherwood

Does Equating Total Volume of Work Between Two Different Exercise Conditions Matter When Examining Exercise-Induced Feeling States? (pp. 209–215)

Chris M. Blanchard, Wendy M. Rodgers, Philip M. Wilson, and Gordon J. Bell