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McCloy Lecture

Are American Children and Youth Fit? It's Time We Learned (pp. 377–388)

James R. Morrow, Jr.

Epidemiology

Progressive Aerobic Cardiovascular Endurance Run and Body Mass Index Among an Ethnically Diverse Sample of 10–15-Year-Olds (pp. 389–397)

Michael W. Beets, Kenneth H. Pitetti, and Bradley J. Cardinal

This study examined the cardiovascular fitness (CVF, Progressive Aerobic Cardiovascular Endurance Run [PACER], number of laps completed) and the prevalence of at risk of overweight (AR) and overweight (OW) among 10–15-year-olds (48% girls) from the following ethnic backgrounds: African American (n = 2,604), Asian-Pacific Islander (n = 3,888), Hispanic (n = 11,680); and White non-Hispanic (n = 16,352). Hierarchical multiple linear regression analysis, controlling for height and weight, with White non-Hispanics serving as the comparison group, revealed a limited number of significant differences among PACER performances, with no values exceeding ± 4.43 laps. Odds ratios (OR) for being classified as AR or OW were significantly greater ($p < .01$) in African American (OR = 1.25, 1.65) and Hispanic (OR = 2.33, 2.28) boys and girls, respectively, and Asian boys (OR = 1.43). The results of this cross-sectional analysis indicated negligible differences in CVF among ethnic groups, while AR and OW were consistent with previous reports for ethnic populations.

Growth and Motor Development

Aging and Tennis Playing in a Coincidence-Timing Task With an Accelerating Object: The Role of Visuomotor Delay (pp. 398–406)

Régis Lobjois, Nicolas Benguigui, and Jean Bertsch

The purpose of the present study was to determine whether playing a specific ball sport, such as tennis, could maintain the coincidence-timing (CT) performance of older adults at a similar level to that of younger ones. To address this question, tennis players and nonplayers of three different age ranges (ages 20–30, 60–70, and 70–80 years) performed a simple CT task consisting of timing their response (pressing a button) to coincide with the arrival of a stimulus at a target. The stimulus moved at either an accelerating, constant, or decelerating velocity. As expected, all participants were affected by the velocity manipulation, which led to late and early responses to accelerating and decelerating stimuli, respectively. Whereas this response bias was increasingly pronounced with advancing age in nonplayers, no difference was found among player groups of different ages. Finally, we showed that the length of the visuomotor delay could explain the effect of nonconstant velocities.

Measurement and Evaluation

Multitrait-Multimethod Investigation of a Novel Body Image Measurement Technique (pp. 407–415)

David A. Rowe, Suzanne M. McDonald, Matthew T. Mahar, and Thomas D. Raedeke

A multitrait-multimethod (MTMM) matrix was used to evaluate validity evidence for a digital image manipulation (DIM) body image measurement technique in young women. One hundred one young women completed the DIM procedure and the Thompson and Gray (1995) Contour Drawing Rating Scale to measure self-ideal discrepancy and size perception accuracy components of body image. Seven-day test-retest reliability was acceptable ($R = .81-.95$). Convergent validity for self-ideal discrepancy was higher ($r = .74$) than the corresponding heterotrait, monomethod coefficients ($r = .46, r = .23$) and heterotrait-heteromethod coefficients ($r = .18, r = .12$). However, the convergent validity coefficient for size perception accuracy was $r = .12$. The pattern of correlations in the MTMM matrix met the criteria of Campbell and Fiske (1959) for validity of these procedures to measure self-ideal discrepancy but not size perception accuracy. The DIM procedure addresses some of the criticisms associated with figure-rating scales, such as unrepresentativeness of the figures, scale coarseness, and restriction of range in responses. DIM, therefore, represents a realistic, valid alternative to figure-rating scales for measuring self-ideal discrepancy.

Motor Control and Learning

Random and Blocked Practice of Movement Sequences: Differential Effects on Response Structure and Movement Speed (pp. 416–425)

Heather Wilde, Curt Magnuson, and Charles H. Shea

Three similar six-element key press sequences were practiced under blocked or random practice schedules with acquisition conducted on one day and retention and transfer on the next day. The task required participants to type, as quickly as possible, one of three 6-element sequences as observed on a computer monitor. In blocked practice, participants completed all practice in one repeated sequence before the next repeated sequence was introduced. In random acquisition practice, the three repeated sequences were randomly presented to the participants. The data suggest that random practice results in participants adopting a uniform response structure, while blocked practice allows participants to exploit unique sequential aspects of the individual tasks. This finding suggests that random practice may not be as effective as blocked practice when one of the tasks being practiced together can be optimized through the development of a unique response structure.

Physiology

An Accurate VO₂max Nonexercise Regression Model for 18–65-Year-Old Adults (pp. 426–432)
Danielle I. Bradshaw, James D. George, Annette Hyde, Michael J. LaMonte, Pat R. Vehrs, Ronald L. Hager, and Frank G. Yanowitz

The purpose of this study was to develop a regression equation to predict maximal oxygen uptake (VO₂max) based on nonexercise (N-EX) data. All participants (N = 100), ages 18–65 years, successfully completed a maximal graded exercise test (GXT) to assess VO₂max (M = 39.96 mL · kg⁻¹ · min⁻¹, SD = 9.54). The N-EX data collected just before the maximal GXT included the participant's age; gender; body mass index (BMI); perceived functional ability (PFA) to walk, jog, or run given distances; and current physical activity (PA-R) level. Multiple linear regression generated the following N-EX prediction equation (R = .93, SEE = 3.45 mL · kg⁻¹ · min⁻¹, % SEE = 8.62): VO₂max (mL · kg⁻¹ · min⁻¹) = 48.0730 + (6.1779 × gender; women = 0, men = 1) - (0.2463 × age) - (0.6186 × BMI) + (0.7115 × PFA) + (0.6709 × PA-R). Cross validation using PRESS (predicted residual sum of squares) statistics revealed minimal shrinkage (R_p = .91 and SEE_p = 3.63 mL · kg⁻¹ · min⁻¹); thus, this model should yield acceptable accuracy when applied to an independent sample of adults (ages 18–65 years) with a similar cardiorespiratory fitness level. Based on standardized b-weights, the PFA variable (0.41) was the most effective at predicting VO₂max followed by age (-0.34), gender (0.33), BMI (-0.27), and PA-R (0.16). This study provides a N-EX regression model that yields relatively accurate results and is a convenient way to predict VO₂max in adult men and women.

Reliability of Heart Rate Responses at Given Ratings of Perceived Exertion in Cycling and Walking (pp. 433–439)

Christos S. Katsanos and Robert J. Moffatt

Eleven healthy men (M age = 27 years, SD = 4) completed three cycling and three walking trials in an alternating order. During each trial, participants were allowed, within 3 min, to adjust the work rate to correspond to given rating of perceived exertion (RPE) values according to the following order: RPE 11, 13, and 15. For cycling as well as walking, at each RPE there were no significant differences between mean heart rate responses across the three trials (p > .05). Mode-specific estimates for heart rate intraclass correlation coefficient and coefficient of variation ranged between .80 and .91, and 5.6% and 8.3%, respectively. This study provides absolute reliability estimates for heart rate responses when using RPE in a production format and suggests there may be RPE- (and mode) specific practice requirements for achieving a reliable heart rate response at a given RPE.

Reliability of Near-Infrared Spectroscopy for Determining Muscle Oxygen Saturation During Exercise (pp. 440–449)

Krista G. Austin, Karen A. Daigle, Patricia Patterson, Jason Cowman, Sara Chelland, and Emily M. Haymes

Near-infrared spectroscopy is currently used to assess changes in the oxygen saturation of the muscle during exercise. The primary purpose of this study was to assess the reliability of near-infrared spectroscopy in determining muscle oxygen saturation (StO₂) in the vastus lateralis during cycling and the gastrocnemius during running for exercise intensities at lactate threshold and maximal effort. Test-retest reliability was determined from an intraclass correlation coefficient obtained from a one-way analysis of variance. Reliability of muscle StO₂ for the gastrocnemius at lactate threshold was R = .87, and R = .88 at maximal effort. Reliability of muscle StO₂ for the vastus lateralis at lactate threshold was R = .94 and R = .99 at maximal effort.

Effect of a Marathon Run on Serum Lipoproteins, Creatine Kinase, and Lactate Dehydrogenase in Recreational Runners (pp. 450–455)

Yoshio Kobayashi, Toshiko Takeuchi, Teruo Hosoi, Hidekiyo Yoshizaki, and Jack A. Loepky

The objective of this study was to determine the effect of a marathon run on serum lipid and lipoprotein concentrations and serum muscle enzyme activities and follow their recovery after the run. These blood concentrations were measured before, immediately after, and serially after a marathon run in 15 male recreational runners. The triglyceride level was significantly elevated postrace, then fell 30% below baseline 1 day after the run, and returned to baseline after 1 week. Total cholesterol responded less dramatically but with a similar pattern. High-density lipoprotein cholesterol remained significantly elevated and low-density lipoprotein cholesterol was transiently reduced for 3 days after the run. The total cholesterol/high-density cholesterol ratio was significantly lowered for 3 days. Serum lactate dehydrogenase activity significantly doubled postrace and then declined but remained elevated for 2 weeks. Serum creatine kinase activity peaked 24 hr after the run, with a 15-fold rise, and returned to baseline after 1 week. The rise of these enzymes reflects mechanically damaged muscle cells leaking contents into the interstitial fluid. It is concluded that a prolonged strenuous exercise bout in recreational runners, such as a marathon, produces beneficial changes in lipid blood profiles that are significant for only 3 days. However, muscle damage is also evident for 1 week or more from the dramatic and long-lasting effect on enzyme levels. Laboratory values for these runners were outside normal ranges for some days after the race.

Psychology

Sport Participation Motivation in Young Adolescent Girls: The Role of Friendship Quality and Self-Concept (pp. 456–467)

Meghan H. McDonough and Peter R. E. Crocker

This study examined the factor structure of the Sport Friendship Quality Scale (SFQS; Weiss & Smith, 1999) and compared two models in which (a) self-worth mediated the relationship between physical self/friendship quality and sport commitment and (b) friendship quality and physical self-perceptions directly predicted self-worth and sport

commitment. Female team sport participants (N = 227) between the ages of 11 and 14 years completed measures of sport commitment, enjoyment, athletic competence, physical attractiveness, self-worth, and friendship qualities. A confirmatory factor analysis found an inadequate fit for the SFQS, mainly due to problems with the loyalty and intimacy subscale. Separating the loyalty and intimacy factor into two subscales provided an adequate fit. Examination of the two structural models indicated that both models provided an adequate overall fit but that self-worth only weakly predicted sport commitment, suggesting the mediator model was impractical. Friendship quality had a weak relationship with self-worth and sport commitment. Results are discussed in light of issues in measuring sport friendship quality and future directions in this developing field.

Effects of a 12-Week Physical Activity Protocol Delivered by YMCA After-School Counselors (Youth Fit For Life) on Fitness and Self-Efficacy Changes in 5–12-Year-Old Boys and Girls (pp. 468–476)

James J. Annesi, Wayne L. Westcott, Avery D. Faigenbaum, and Jennifer L. Unruh

To address reduced physical education (PE) in elementary schools, a 12-week physical activity protocol was tested on 5–12-year-old, primarily African American, girls (n = 226) and boys (n = 344) at 14 YMCA after-school care sites. The 3 times/week, 45-min session curriculum included cardiovascular, resistance, and flexibility training, in which all children could participate simultaneously, and a behavioral skills education component. After-school counselors, formerly untrained in PE methods, administered the sessions, with periodic supervision by YMCA wellness staff members. Analyses of the eight Age x Sex subsamples indicated significant improvements on body composition, strength, and endurance, both within-groups and when predicted changes due to maturation were accounted for. Exercise barriers self-efficacy significantly increased in subsamples of 9–10- and 11–12-year-old girls only. The need for replication across ethnic groups was suggested. Limitations and the need for extension of research on supplementation of elementary school PE were discussed.

Team-Referent Attributions Among Sport Performers (pp. 477–487)

Iain Greenlees, Andrew Lane, Richard Thelwell, Tim Holder, and Gina Hobson

The aim of this study was to develop and validate a team-referent attribution scale. Conducted over three studies, Study 1 modified items from McAuley, Duncan, and Russell's (1992) Causal Dimension Scale II by rewording items to reflect team attributions and adding one item per factor. This led to the development of a 16-item scale (Causal Dimension Scale-T, CDS-T). Study 2 tested competing models of attribution theory among a sample of 433 team sport players. Confirmatory factor analysis indicated strongest support for a four-factor model (robust comparative fit index = .961; root mean squared error of approximation = .054). Study 3 tested the predictive validity of the scale among a sample of 201 team players. Results indicated that winners reported more internal and stable attributions than losers. Further, performances perceived as successful

were associated with stable attributions. The results of the study, therefore, suggest that the CDS-T provides a valid measure of team-referent attributions in sport.

Research Notes

Does the Throwing "Gender Gap" Occur in Germany? (pp. 488–493)

Tanja Ehl, Mary Ann Robertson, and Stephen J. Langendorfer

Does Data Distribution Change as a Function of Motor Skill Practice? (pp. 494–499)

Jin H. Yan, Ward A. Rodriguez, and Jerry R. Thomas

Strength Inhibition Following an Acute Stretch Is Not Limited to Novice Stretchers (pp. 500–506)

Arnold G. Nelson, Joke Kokkonen, and Carol Eldredge

Examining the Moderating Effect of Appearance Impression Motivation on the Relationship Between Perceived Physical Appearance and Social Physique Anxiety (pp. 507–513)

Anthony J. Amorose and Jill Hollembeck