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Epidemiology

Effects of a Pedometer-Based Intervention on Daily Step Counts of Community-Dwelling Older Adults (pp. 401–406)
Karen A. Croteau, Nancy E. Richeson, Bonnie C. Farmer, and David B. Jones

This study investigated the effect of a 12-week pedometer-based intervention on daily step counts of 147 older adults randomly assigned to an intervention or wait-list control group (M age = 72.9 years, SD = 8.8). The intervention group significantly increased their daily step counts after 12 weeks (M = 639, SD = 2,239) and continued to significantly increase during a 12-week maintenance period (M = 680, SD = 1,721). The control group exhibited no change during the control period (M = -393, SD = 2,050) but had a significant increase in daily step counts (M = 1,580, SD = 2,305) when enrolled in the intervention. The pedometer-based intervention was effective in increasing participants' daily step counts.

What Are the Contributory and Compensatory Relationships Between Physical Education and Physical Activity in Children? (pp. 407–412)
Charles F. Morgan, Aaron Beighle, and Robert P. Pangrazi

Limited data are available on the contributory and compensatory relationships between physical education and physical activity in children. Four hundred eighty-five (280 girls) children in first through sixth grades wore sealed pedometers during waking hours, including normally scheduled physical education lessons. The least, moderately, and most active children accumulated approximately 1,700, 1,100, and 2,500 more steps/day, respectively, on school days with physical education. No compensatory increases in physical activity were found on school days that did not offer physical education. The implications of the contributory relationship are highlighted by the evidence that 50% of the least active children were at risk for overweight or overweight and that no compensatory increases in physical activity were found on school days when physical education classes were not scheduled.

Tracking Club Sport Participation From Childhood to Early Adulthood (pp. 413–419)
Rosalina Richards, Sheila Williams, Richie Poulton, and Anthony I. Reeder

This study examined the strength of tracking et sport participation from childhood to early adulthood among the Dunedin Multidisciplinary Health and Development Study cohort. Participation in sport, dance, or gymnastics as part of a club or group (outside of school) was assessed at ages 7, 9, 15, 18, and 21 years. In addition to the traditionally used correlation coefficients, summary statistics (intraclass correlations; ICC) from random effect models and stability coefficients from generalized estimating equations (GEE) were calculated using all the longitudinal data and controlling for the influence of covariates on tracking strength. Correlation coefficients revealed statistically significant tracking of club sport participation (7–21 years) at low levels (r = .07–0.28). The ICC summary statistic (0.23) was consistent with this, while the GEE suggested moderate tracking (0.59). The results of this study suggest that encouraging sport participation during childhood and adolescence may result in a modest increase in the likelihood of participation later in life. However, the substantial movement into and out of sport participation observed here and in other studies cautions against relying solely on sport promotion among youth as a strategy to promote lifelong participation.

Effects of Age, Walking Speed, and Body Composition on Pedometer Accuracy in Children (pp. 420–428)
J. Scott Duncan, Grant Schofield, Elizabeth K. Duncan, and Erica A. Hinckson

The objective of this study was to investigate the effects of age group, walking speed, and body composition on the accuracy of pedometer-determined step counts in children. Eighty-five participants (43 boys, 42 girls), ages 5–7 and 9–11 years, walked on a treadmill for two-minute bouts at speeds of 42, 66, and 90 $m \bullet min^{-1}$ while wearing a spring-levered (Yamax SW-200) and a piezoelectric (New Lifestyles NL-2000) pedometer.

The number of steps taken during each bout was also recorded using a hand counter. Body mass index (BMI) was calculated from height and mass, and percentage of body fat (%BF) was determined using hand-to-foot bioelectrical impedance analysis. The tilt angle of the pedometer was assessed using a magnetic protractor. Both pedometers performed well at 66 and 90 $m \cdot min^{-1}$, but undercounted steps by approximately 20% at 42 $m \cdot min^{-1}$. Although age group, BMI, waist circumference, and %BF did not affect pedometer accuracy, children with large pedometer tilt angles ($\geq$ 10º) showed significantly greater percent bias than those with small tilt angles (< 10º). We suggest that the style of waistband on the child's clothing is a more important determinant of tilt angle and thus pedometer accuracy than body composition. Our results also indicate that the NL-2000 pedometer provides similar accuracy and better precision than the SW-200 pedometer, especially in children with large tilt angles. We conclude that fastening pedometers to a firm elastic belt may improve stability and reduce undercounting in young people.

Pedometer-Determined Physical Activity and Its Comparison With the International Physical Activity Questionnaire in a Sample of Belgian Adults (pp. 429–437)
Katrien De Cocker, Greet Cardon, and Ilse De Bourdeaudhuij

Pedometer-determined physical activity (PA) levels in Belgian adults were provided and compared to PA scores reported in the International Physical Activity Questionnaire (IPAQ). The representative sample (N = 1,239) of the Belgian population took on average 9,655 (4,526) steps/day. According to pedometer indices 58.4% were insufficiently active. Steps/day differed significantly between gender ($F = 5.0$, $p = .026$), age groups ($F = 3.3$, $p = .01$), employment status ($F = 6.2$, $p = .013$), and days of monitoring ($F = 7.4$, $p = .007$). Steps/day were negatively correlated to the time spent sitting and positively to PA at work, in transport, and in leisure time ($p < .001$). Steps data can discriminate between PA levels reported in the IPAQ. Belgian population pedometer-determined PA levels are higher than those reported in samples of the United States; however, there is a wide distribution of ambulatory behavior.

Growth and Motor Development

Physical Fitness in Children With Developmental Coordination Disorder (pp. 438–450)
Nadja Schott, Verena Alof, Daniela Hultsch, and Dagmar Meermann

The protective effects of physical activity and fitness on cardiovascular health have clearly been shown among normally developed children. However, data are currently lacking pertaining to children with developmental coordination disorder (DCD). The purpose of this study was to examine differences in fitness measures, body composition, and physical activity among children with and without DCD. A cross-sectional design was implemented examining 261 children (118 girls, 143 boys) ages 4–12 years (mean age 7.8 ± 1.9 years). Children were categorized as having DCD if they scored less than or equal to the 5th percentile (n = 71) or between the 6th and the 15th percentile (n = 52) on the Movement Assessment Battery for Children (MABC; Henderson & Sugden, 1992). The typically developing children had scores between the 16th and the 50th percentile (n = 106) or above the 50th percentile (n = 32) on the MABC. The age-related body mass index was used to characterize body composition. Physical fitness was assessed with a 6-min run, 20-m sprint, jump-and-reach test, medicine ball throw, curl-ups, and sit-and-reach test. Physical activity was estimated with a questionnaire. The percentage of overweight and obese children ages 10–12 years were significantly higher in the DCD groups (severe: 50%, moderate: 23.1%) than in the typically developing groups (medium: 5.6%, high: 0%; p □ .05). Significant interactions (MABC x Age Group) were found for the fitness tests (p values □ .05), except flexibility; whereby specifically, compared to the children in the typically developing groups children in the DCD groups ages 4–6 years achieved significantly worse results for the 20-m sprint, and children of the DCD groups ages 10–12 years achieved significantly worse results for the 6-min run, jump-and-reach test, and medicine ball throw. The study demonstrates poorer performance in fitness tests with high demands on coordination in children with DCD compared to their typically developing peers. Furthermore, the differences in fitness increased with age between children in the DCD groups versus the typically developing groups.

Measurement and Evaluation

Using the Cumulative Common Log-Odds Ratio to Identify Differential Item Functioning of Rating Scale Items in the Exercise and Sport Sciences (pp. 451–464)
Randall D. Penfield, Peter R. Giacobbi, Jr., and Nicholas D. Myers

One aspect of construct validity is the extent to which the measurement properties of a rating scale are invariant across the groups being compared. An increasingly used method for assessing between-group differences in the measurement properties of items of a scale is the framework of differential item functioning (DIF). In this paper we introduce the concept of DIF as a validation tool for scales used in physical education and exercise science, and illustrate the use of the cumulative common log-odds ratio for assessing the presence of DIF with data from the Exercise Imagery Inventory (EII; Giacobbi, Hausenblas, & Penfield, 2005).

Motor Control and Learning
Repeated Retention Testing Effects Do Not Generalize to a Contextual Interference Protocol (pp. 465–475)
Jeffrey T. Fairbrother, John B. Shea, and T. Scott Marzilli

Three experiments examined repeated retention testing effects in a contextual interference (CI) protocol. Retention was assessed at 10 min and 24 hr following acquisition or at just 24-hr for the one-test conditions. Experiments 1 and 2 used speeded-response key-pressing tasks. Dependent measures were total time and errors. Experiment 3 used sequential-timing tasks. Dependent measures were absolute error and absolute constant error. Results revealed CI effects in each experiment. Repeated retention testing effects were not found in Experiments 1 and 3. Experiment 2 revealed superior performance by the two-test condition compared to the one-test condition. This result was qualified by possible practice effects during the 10-min test. It was concluded that repeated retention testing does not present problems for most studies of CI.

The Effect of Self-Regulated and Experimenter-Imposed Practice Schedules on Motor Learning for Tasks of Varying Difficulty (pp. 476–486)
Katherine M. Keetch and Timothy D. Lee

Research suggests that allowing individuals to control their own practice schedule has a positive effect on motor learning. In this experiment we examined the effect of task difficulty and self-regulated practice strategies on motor learning. The task was to move a mouse-operated cursor through pattern arrays that differed in two levels of difficulty. Participants learned either four easy or hard patterns after assignment to one of four groups that ordered practice in blocked, random, self-regulated, and yoked-to-self-regulated schedules. Although self-regulation provided no special benefit in acquisition, these groups showed the most improved performance in retention, irrespective of task difficulty. Although individual switch strategies for members of the self-regulated groups were quite variable, the impact of self-regulation on motor learning remained similar. These findings add to the growing body of literature suggesting that self-regulated practice is an important variable for motor learning.

Pedagogy
Experienced Physical Education Teachers Reaching Their "Use-by Date:" Powerless and Disrespected (pp. 487–499)
Peter R. Whipp, Gregory Tan, and Poh Tin Yeo

With the needs of experienced teachers potentially overshadowed by a focus on recruitment, the purpose of this study was to retrospectively explore the reasons why three experienced physical education teachers resigned. They were interviewed through Louis and Smith's (1990) quality of work life (QWL) model. Data suggested shared dissatisfactions related to the lack of "genuine" opportunities to participate in educational debate and decision making, and limited professional respect shown by administrators and parents. A physical education teacher's "use-by date" was proposed. Unless these issues are further explored and addressed, quality teachers will continue to abandon the service.

Is In-Class Physical Activity at Risk in Constructivist Physical Education? (pp. 500–509)
Ang Chen, Robert Martin, Haichun Sun, and Catherine D. Ennis

Constructivist physical education emphasizes cognitive engagement. This study examined the impact of a constructivist curriculum on in-class physical activity. Caloric expenditure in metabolic equivalents (MET) and vector magnitude count (VM) data from a random sample of 41 constructivist lessons were compared with those from a random sample of 35 nonconstructivist lessons. Statistical analyses revealed that students in both curriculum conditions were active at a similarly low-moderate level (MET = 2.6 for experimental, 2.5 for comparison, $p = .30$). Differences ($p < .05$) were found between the three units within the constructivist curriculum. The findings suggest that the constructivist approach may facilitate knowledge learning with little risk of reducing in-class physical activity.

Psychology

Effects of Aerobic Exercise on Overweight Children's Cognitive Functioning: A Randomized Controlled Trial (pp. 510–519)
Catherine L. Davis, Phillip D. Tomporowski, Colleen A. Boyle, Jennifer L. Waller, Patricia H. Miller, Jack A. Naglieri, and Mathew Gregoski

The study tested the effect of aerobic exercise training on executive function in overweight children. Ninety-four sedentary, overweight but otherwise healthy children (mean age = 9.2 years, body mass index ≥ 85th percentile) were randomized to a low-dose (20 min/day exercise), high-dose (40 min/day exercise), or control condition. Exercise sessions met 5 days/week for 15 weeks. The Cognitive Assessment System (CAS), a standardized test of cognitive processes, was administered individually before and following intervention. Analysis of covariance on posttest scores revealed effects on executive function. Group differences emerged for the CAS Planning scale ($p = .03$). Planning scores for the high-dose group were significantly greater than those of the control group. Exercise may prove to be a simple, yet important, method of enhancing aspects of children's mental functioning that are central to cognitive and social development.

Influence of Involvement in the Girls on Track Program on Early Adolescent Girls' Self-Perceptions (pp. 520–5301)
Jennifer J. Waldron

The Model of Competence Motivation (Harter, 1978) highlights how self-perceptions are influenced by individual and socialization factors. Using this model, the present study investigated, quantitatively with a pretest and posttest design (N = 34) and qualitatively via individual interviews (N = 8), how involvement in the Girls on Track program (GOT) influenced the perceived competence and self-worth of sixth-grade girls. GOT is a program that uses training for a 5-km race as a means to teach life skills. The self-perceptions of the participants showed increasing trends from pre- to posttest. Interviewed girls discussed their acquisition of interpersonal skills and of positive feelings about themselves. The discussion emphasizes how program involvement can influence the development of self-perceptions in early adolescent girls.

Ethnicity as a Moderator of the Theory of Planned Behavior and Physical Activity in College Students (pp. 531–541)
Chris M. Blanchard, Janet Kupperman, Phil Sparling, Eric Nehl, Ryan E. Rhodes, Kerry S. Courneya, Frank Baker, and Tiffany Hunt

Most college students do not meet physical activity (PA) guidelines, and ethnic disparities exist. The present study examined the utility of the theory of planned behavior (TPB) in explaining PA intentions and behavior in black and white college students and whether any TPB relationships were moderated by ethnicity. Black (n = 170) and white (n = 180) students completed a baseline TPB questionnaire and PA assessment 2 weeks later. Hierarchical latent variable regression analyses showed that affective attitude, subjective norm, and perceived behavioral control (PBC) were significant predictors of intention for both ethnic groups, whereas the PBC-intention relationship was significantly stronger for white students. Intention significantly predicted PA for both ethnic groups. Furthermore, common and ethnic-specific beliefs were identified.

Research Note
Accuracy of Step Recording in Free-Living Adults (pp. 542–547)
Timothy K. Behrens, Mary K. Dinger, Sara K. Vesely, and David A. Fields