

Epidemiology

Tracking and Explanation of Physical Activity in Young Adults Over a 7-Year Period (pp. 376–385)
Ilse De Bourdeaudhuij, James Sallis, and Corneel Vandelanotte

Tracking and explaining physical activity in young adults was investigated in a 7-year longitudinal design. From a representative sample of 980 respondents at baseline (M age = 21 years), 172 respondents, comprising 18% of the original sample, completed psychosocial questionnaires and were interviewed at home to assess their level of physical activity at follow-up. Psychosocial variables were grouped into four groups: social variables, self-efficacy, perceived benefits, and perceived barriers. Drop-out analyses showed no major differences between the baseline and follow-up samples. The aims of the present study were: (a) to investigate tracking in physical activity and psychosocial determinants over a 7-year period, and (b) to examine baseline determinants and change in determinants in predicting physical activity change in men and women. No significant tracking of physical activity level was found for men. For women, moderate tracking scores were found for total energy expenditure and moderate-intensity energy expenditure ($r = .34$ and $.41$, respectively). There was higher tracking in psychosocial determinants than in physical activity. Relatively high tracking scores for perceived benefits and barriers suggest that cognitions related to physical activity are more stable than the behavior itself. Although baseline psychosocial variables were poor predictors of physical activity change, determinants' change scores accounted for 16–19% of the variance in physical activity in men and 7–24% in women. Significant predictors were different for men and women. Present results can inform the design of physical activity interventions for these populations.

Growth and Motor Development

Age-Related Differences in Vision and Proprioception in a Lower Limb Interceptive Task: The Effects of Skill Level and Practice (pp. 386–395)

A. Mark Williams, Cornelia Weigelt, Mark Harris, and Mark A. Scott

This study examined age-related differences in the role of visual proprioception during a lower limb interceptive action and how this varies as a function of skill and practice. In Experiment 1, skilled and less-skilled 8-, 10-, and 12-year-old boys controlled a soccer ball using their preferred foot under full vision and when sight of the effector was occluded. With the exception of the high-skilled 12-year-olds and low-skilled 8-year-olds, participants showed a decrement in performance when denied access to visual proprioception. In Experiment 2, the effect of practicing under different informational constraints was examined for 12 year-old boys. Children performed varying amounts of practice under full vision, or in a condition where sight of the foot was occluded, before being transferred to the alternative viewing condition. Participants who practiced under occluded viewing conditions showed greater relative improvement in performance over practice and transfer sessions compared with a full vision control group. Some support is provided for the manipulation of visual informational constraints as an effective pedagogical approach to motor learning.

Change in Throwing Pattern: Critical Values for Control Parameter of Velocity (pp. 396–407)

Dan Southard

The purpose of this study was to determine the critical values at which throwing patterns change when scaling up on the control parameter of velocity. Thirty-six participants (ages: 6–12 years) were categorized into four throwing levels according to patterns represented by temporal joint lag. Each participant was required to complete 5 overhand throws at each of 10 relative velocities for a total of 50 trials per participant. The lowest velocity was 10% of maximum, with increases in increments of 10% up to a maximum effort. Quantitative and qualitative analyses indicated that critical values varied according to throwing category and joint. Generally, lower skilled throwers (Levels 1 and 2) had less stable joint lag and changed patterns at lower velocities than higher skilled (Levels 3 and 4) throwers.

Motor Control and Learning

Self-Controlled Feedback: Does It Enhance Learning Because Performers Get Feedback When They Need It? (pp. 408–415)

Suzete Chiviakowsky and Gabriele Wulf

This paper examines whether self-controlled feedback schedules enhance learning, because they are more tailored to the performers' needs than externally controlled feedback schedules. Participants practiced a sequential timing task. One group of learners (self-control) was provided with feedback whenever they requested it, whereas another group (yoked) had no influence on the feedback schedule. The self-control group showed learning benefits on a delayed transfer test. Questionnaire results revealed that self-control learners asked for feedback primarily after good trials and yoked learners preferred to receive feedback after good trials. Analyses demonstrated that errors were lower on feedback than no-feedback trials for the self-control group but not for the yoked group. Thus, self-control participants appeared to use a strategy for requesting feedback. This might explain learning advantages of self-controlled practice.

Physiology

Comparison of 1 and 2 Days Per Week of Strength Training in Children (pp. 416–424)

Avery D. Faigenbaum, Laurie A. Milliken, Rita LaRosa Loud, Bernadette T. Burak, Christina L. Doherty, and Wayne L. Westcott

The purpose of this study was to compare the effects of 1 and 2 days per week of strength training on upper body strength, lower body strength, and motor performance ability in children. Twenty-one girls and 34 boys between the ages of 7.1 and 12.3 years volunteered to participate in this study. Participants strength trained either once per week ($n = 22$) or twice per week ($n = 20$) for 8 weeks at a community-based youth fitness center. Each training session consisted of a single set of 10–15 repetitions on 12 exercises using child-size weight machines. Thirteen children who did not strength train served as age-matched controls. One repetition maximum (1RM) strength on the chest press and leg press, handgrip strength, long jump, vertical jump, and flexibility were assessed at baseline and posttraining. Only participants who strength trained twice per week made significantly greater gains in 1RM chest press strength, compared to the control group (11.5 and 4.4% respectively, $p < .05$). Participants who trained once and twice per week made gains in 1RM leg press strength (14.2 and 24.7%, respectively) that were significantly greater than control group gains (2.4%). On average, participants who strength trained once per week achieved 67% of the 1RM strength gains. No significant differences between groups were observed on other outcome measures. These findings support the concept that muscular strength can be improved during the childhood years and favor a training frequency of twice per week for children participating in an introductory strength training program.

Psychology

Exerted Effort and Performance in Climbing Among Boys: The Influence of Achievement Goals, Perceived Ability, and Task Difficulty (pp. 425–436)

Philippe Sarrazin, Glyn Roberts, François Cury, Stuart Biddle, and Jean-Pierre Famosé

In achievement contexts such as sport, achievement goal theory assumes that an individual's major concern is to demonstrate competence. However, competence may be expressed in two ways: as task and ego involvement (Nicholls, 1989). Seventy-eight boys (M age = 13.6 years) performed five climbing courses, and the influence of achievement goals, perceived ability, and task difficulty on effort and performance was studied. According to the achievement goal theory: (a) task-involved boys exerted more effort and performed better than ego-involved boys; and (b) exerted effort was determined by an interaction of one's achievement goal, perceived ability (PA), and task difficulty. Ego-high PA boys and task-low PA boys exerted the most effort on the moderate course; ego-low PA boys exerted least effort on the moderate and very difficult courses. Finally, task-high PA boys exerted more effort on the most difficult courses. The motivational processes underlying these findings are discussed.

Evidence for the Importance of Openness to Experience on Performance of a Fluid Intelligence Task by Physically Active and Inactive Participants (pp. 437–444)

Marc R. Lochbaum, Paul Karoly, and Daniel M. Landers

The cross-sectional relationship between exercise training history and performance on a fluid intelligence test was examined. In addition, openness to experience was included as a potential trait-based contributor to predicting cognitive performance. Results supported past literature demonstrating that aerobically trained or active participants performed significantly better on the fluid intelligence task than aerobically untrained or inactive participants. Hierarchical regression analysis results revealed, as predicted, that openness to experience was a significant predictor of fluid intellectual performance. When entered into the hierarchical regression equation, openness to experience accounted for 16.0% of unique variance in Culture Fair Intelligence Test performance. By contrast, participants' exercise training history, which initially and significantly ($p < .05$) accounted for approximately 12.0% of the variance

in cognitive performance, accounted for 5.0% ($p > .05$) after openness was entered. Participants were, on average, more open than inactive participants. Results are discussed in terms of the possible mechanisms aerobic exercise training and openness to experience share in regard to brain functioning and performance of fluid intelligence tasks. Future research is suggested that examines biological factors known to influence cognitive performance in exercise settings.

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