

- [Articles](#)
- [Research Notes](#)

ARTICLES

206

Epidemiology

Leisure Time Physical Activity in Australian Women: Relationships With Well Being and Symptoms Wendy J. Brown, Gita Mishra, Christina Lee, and Adrian Bauman

This paper explores the association between moderate levels of physical activity (PA) and health benefits in well being and symptoms such as tiredness, back pain, and constipation. Participants in the Australian Longitudinal Study on Women's Health, 14,502 young women (ages 18-23 years), 13,609 middle-age women (45-50 years), and 11,421 older women (ages 70-75 years), answered questions about vigorous and less vigorous exercise (used to determine a physical activity score), well being (SF-36), symptoms, and medical conditions. There were significant associations between the PA score and SF-36 in each cohort. Odds ratios (OR) for a range of symptoms and conditions were lower for women who reported low to moderate activity than for sedentary women, for example, for young women or for constipation = 0.76 (CI, 0.65-0.89), for middle-age women or for tiredness = 0.70 (0.63-0.78). There was no threshold of PA at which health benefits increased significantly. Although cross-sectional, the findings suggest that low-to-moderate levels of exercise are associated with a range of health benefits for women of all ages. These preliminary findings will be followed up during the longitudinal study.

217

Motor Control and Learning

Practicing a Maximal Performance Task: A Cooperative Strategy for Muscle Activity David A. Gabriel and Jean P. Boucher

The effect of practice on predicting elbow flexion movement time was studied. Participants (N = 18) performed 400 elbow flexion trials to a target in the horizontal plane. The trials were distributed equally over four sessions. The goal was to decrease the movement time (MT) for the same degree of accuracy. The electromyographic (EMG) activity of the biceps and triceps brachii was monitored with standard Beckman Ag/AgCl surface electrodes. The EMG measures formed two variable sets within one prediction equation. One variable set was composed of the onset of muscle activity relative to the start of movement (motor time) and the duration of muscle activity. The other variable set consisted of the mean amplitude value of the entire burst and of the first 30 ms (Q30) of activity. As the maximal speed of limb movement increased, the duration of muscle activity (motor time and EMG duration) decreased, and the magnitude of muscle activity (MAV and Q30) increased. Most of the change in the duration of muscle activity occurred in Session 1, while the magnitude of muscle activity continued to increase until Session 3. Multiple regression analysis revealed a cooperative strategy between the magnitude and duration of muscle activity. Early in learning, participants adjusted the magnitude of muscle activity to increase limb movement speed. As practice continued, alterations in the duration of muscle activity became more important, while the magnitude changes were less involved. Late in learning, both dimensions of

muscle activity were used to decrease MT. We suggest that the interplay between the magnitude and duration of muscle activity may be due to: (a) cognitive factors related to the division of attention in a motor skill, (b) an increase in the frequency of motor unit firing that affects both dimensions of muscle activity, or (c) some combination of (a) and (b).

229

Attentional Focus in Complex Skill Learning Gabriele Wulf, Nancy H. McNevin, Thomas Fuchs, Florian Ritter, and Tonya Toole

Experiment 1 examined whether it is more advantageous to direct learners' attention to the external effects of their movements relative to other external cues. Two groups of participants hit tennis balls at a target, with one group focusing on the ball coming toward them (antecedent) and the other group focusing on the ball leaving the racket (effect). The effect group demonstrated more effective learning. Experiment 2 examined whether it is more beneficial if the movement effect is related to the movement technique, relative to other movement effects (e.g., outcome). Two groups of participants hit golf balls at a target. The attention of these groups was directed to the club or the ball trajectory, respectively. The club group showed more effective learning than the target group, suggesting that focusing on technique-related effects is more effective.

240

Pedagogy

Restricting Opportunities to Be Active During School Time: Do Children Compensate by Increasing Physical Activity Levels After School? Darren Dale, Charles B. Corbin, and Kathleen S. Dale

Opportunities for children to be physically active during school time are sparse and becoming increasingly so. The purpose of this investigation was to determine if children would compensate for school days (9 a.m. - 3 p.m.) of restricted physical activity opportunities by increasing activity levels after school (3 p.m. - 7:30 p.m.). Third and fourth grade children (N = 76) each wore a CSA accelerometer for 4 nonconsecutive days. Two days were categorized as active-during school, all children participated in outdoor recess and physical education class. Two days were categorized as restricted-all children spent their recess time indoors at a computer terminal, and no physical education class was scheduled. Dependent t tests revealed that children did not compensate for a sedentary school day by increasing their levels of physical activity after school. In fact, average movement counts per minute were higher in the 3 p.m. - 7:30 p.m. period following the active day (525 counts·min⁻¹) versus the restricted day (186 counts·min⁻¹). These findings suggest cause for concern if children's opportunities to be active within school time are limited. Several reasons are given as to why children did not compensate or "make up" for the physical activity opportunities missed during the restricted school day.

249

Student Activity Levels, Lesson Context, and Teacher Behavior During Middle School Physical Education Thomas L. McKenzie, Simon J. Marshall, James F. Sallis, and Terry L. Conway

There is little research on students' engagement in physical activity in middle school physical education (PE). We observed student activity, lesson context, and teacher behavior in 430 PE lessons taught by 126 teachers in 24 schools. Variables were analyzed by mixed-model nested analyses of covariance. Boys were more active than girls overall and during skill drills, game play, and free play. Student activity varied by lesson context, with fitness activities producing the most activity. Class size was negatively associated with student activity. Daily PE contributed a weekly total of 25 min of vigorous activity and 83 min of moderate-to-vigorous activity-much less than

national objectives. Results suggest that numerous opportunities exist for increasing student physical activity during middle school PE.

260 Physiology

The Effects of Repeated Maximal Voluntary Isokinetic Eccentric Exercise on Recovery From Muscle Damage Trevor C. Chen and Sandy S. Hsieh

This study investigated whether performing repeated bouts of maximal voluntary isokinetic eccentric exercise (MAX1) on 3 (MAX3) and 6 days (MAX6) after the initial bout would produce significant changes in the indirect markers of muscle damage and total work. A secondary purpose was to determine whether participants' psychological maximal effort was equivalent to the physiological maximal effort during muscle soreness. Male university students were assigned randomly to a control group ($n = 12$) and a group that repeated the exercise (EX; $n = 12$). The MAX1 was 3 x 10 repetitions of the nondominant elbow flexors on the Cybex 6000 system at a speed of 60 deg/s. The EX group performed the same exercise 3 days and 6 days after MAX1. The range of motion and maximal isometric force (MIF), muscle soreness index, plasma creatine kinase, and glutamic-oxaloacetate transaminase activities were measured before and every 24 hr for 9 days after MAX1 for both groups. MIF was also assessed once before and immediately after each MAX for the EX group. There were no significant changes ($p > .05$) between the groups for all criterion measures, except for total amount of work ($p < .05$). It is concluded that strenuous voluntary isokinetic eccentric exercise performed with damaged muscles does not appear to exacerbate damage or influence the recovery process. Although individuals could perform repeated MAXs, the total work performed was significantly reduced. This has practical implications in strength training for coaches and athletes during muscle damage.

267 Psychology

Predictors of Intrinsic Motivation Among Adolescent Students in Physical Education Emilio Ferrer-Caja and Maureen R. Weiss

This study examined the relationships among social factors, individual differences, intrinsic motivation, and effort and persistence in the physical education context using cognitive evaluation theory as a framework. Female ($n = 201$) and male ($n = 206$) high school students completed measures of motivational climate, teaching style, perceived competence, self-determination, goal orientations, and intrinsic motivation. Teachers rated the students on effort and persistence in the class activities. Hypothesized relationships among the variables were tested using structural equation modeling. Results revealed that perceived competence and goal orientations directly predicted intrinsic motivation and mediated the effects of motivational climate and teaching style on intrinsic motivation. Intrinsic motivation directly predicted effort and persistence. Task goal orientation mediated the effects of learning climate on perceived competence and self-determination. The strongest predictors of intrinsic motivation and effort and persistence were task goal orientation, perceived competence, and learning climate.

280

The Relation of Self-Efficacy Measures to Sport Performance: A Meta-Analytic Review Sandra E. Moritz, Deborah L. Feltz, Kyle R. Fahrenbach, and Diane E. Mack

This meta-analysis examined the relationship between self-efficacy and performance in sport. Based on 45 studies (102 correlations), the average correlation between self-efficacy and sport performance was .38. Given the heterogeneity of findings, follow-up univariate and multivariate moderator analyses were conducted. Results indicated that the most important moderator was concordance, thereby highlighting the importance of matching the self-efficacy and performance measures. Additional

moderators we examined included the types of self-efficacy measures, the types of performance measures, the nature of the task, and the time of assessments. These variables accounted for approximately 44% of the variance in the self-efficacy-performance relationship. Practical implications of the findings are discussed

RESEARCH NOTES

p. 295

(Un)Informed Consent in Exercise and Sport Science Research? A Comparison of Forms Written for Two Reading Levels

Bradley J. Cardinal

p. 302

Preparticipation Physical Activity Screening Within a Racially Diverse, Older Adult Sample: Comparison of the Original and Revised Physical Activity Readiness Questionnaires

Bradley J. Cardinal and Marita K. Cardinal

p. 308

Activity Involvement, Goal Perspective, and Self-Esteem Among Mexican American Adolescents

Bobby Guinn, Vern Vincent, Tom Semper, and Layne Jorgensen

Commentary

p. 312

Errata