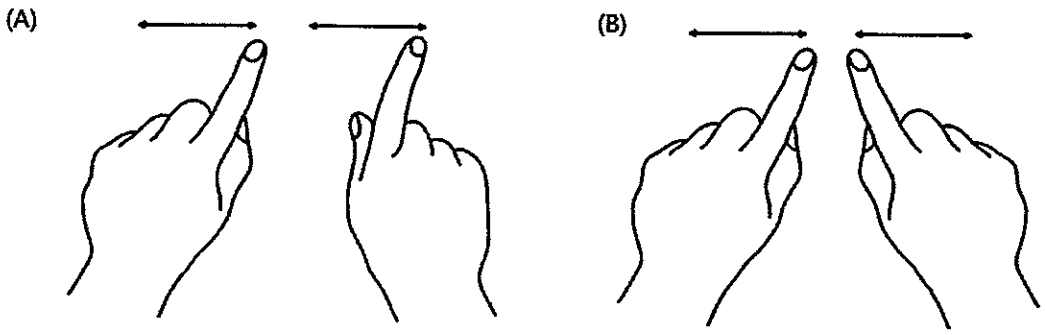
請閱讀該文獻內容並回答問題 1、2。(摘錄自 Front Aging Neurosci. 2023;15:1124109；Biology & Philosophy. 2020;35:48)

In a laboratory context, bimanual coordination is frequently characterized by two stable and flexible patterns [in-phase (IP) and anti-phase (AP)] (Kelso, 1984). Conventionally, the in-phase (IP) pattern is achieved through the simultaneous activation of homologous forearm muscles groups thereby giving rise to mirror-symmetrical movements concerning the body midline; while the anti-phase pattern (AP) is achieved through the simultaneous activation of non-homologous muscles groups thereby one limb moves toward the body midline, while the other limb moves away from it and vice versa (e.g., Temprado et al., 2010, 2020).



1. **請解釋何謂 in-phase pattern、何謂 anti-phase pattern？(20%)**
2. **請問(A)圖與(B)圖，何者動作為 in-phase pattern、何者動作為 anti-phase pattern。(5%)**

請閱讀該文獻內容並回答問題 3、4。(摘錄自 Clin Neurophysiol. 2016;127(1):693-697.)

Abstract

Objective: Recently, arm facilitation has been interested in gait rehabilitation. However, there have been few studies concerning arm facilitation in patients with Parkinson's disease (PD). The aim of our study was to investigate the effect of increasing arm weights on gait pattern in patients with PD.

Methods: Twenty-seven patients with PD were enrolled, and they underwent gait analysis using a three-dimensional motion capture system. Sandbags were applied to the distal forearms in all participants. We compared gait parameters including arm swing, pelvic motion, spatiotemporal data, and relative rotational angle between the weighted and unweighted gaits.

Results: The total arm-swing amplitude and pelvic rotation were significantly higher when walking with additional arm weights than without arm weights. Cadence, walking speed, stride length, and swing phase were significantly higher, whereas stride time, double-support time, and stance phase were significantly lower, when walking with additional arm weights than without arm weights.

Conclusions: We conclude that adding weights to the arm during walking may facilitate arm and pelvic movements, which results in changes to gait patterns. The therapeutic use of additional arm weights could be considered for gait rehabilitation in PD to improve gait impairment.

3. **請為此摘要下一個英文與中文標題。(10%)**
4. **請用中文解釋該研究的重要結果，並說明您會如何於臨床應用此篇研究的發現。(15%)**

見背面

請閱讀以下文獻的標題和研究摘要，並回答問題 5、6。(摘錄自 J Autism Dev Disord. 2023;53(2):633-647)

Promoting Positive Health Outcomes in an Urban Community-Based Physical Activity Intervention for Preschool Aged Children on the Autism Spectrum

Abstract

While there is wide consensus regarding the importance of early intervention, health is rarely considered within priorities. Twenty-five children on the autism spectrum (*M*age = 4.67, SD = 0.82) participated in a 12-week physical activity intervention. Primary objective was to examine impact of a physical activity intervention on physical activity, fitness and motor competence. Secondary objective was to examine associations between motor behavior and ASD symptoms. Ball skills ($p < .001$) and isometric push-up performance ($p = .02$) improved. Autism symptoms were associated with motor skills ($r > -.49, p < .05$). Study outcomes provide new knowledge regarding design, delivery, and measures for early interventions targeting health disparities in young children on the autism spectrum.

Procedures

All study procedures were approved by the Institutional Review Board at a large urban university in Southeast Michigan. Pre-measures were evaluated over 2 separate meetings prior to study commencement. In the first meeting, approximately 1-month pre intervention, parents consented their child's participation in the study, and completed a questionnaire regarding their child's extracurricular and physical activity behavior (including community services, occupational and physical therapy). Following completion of the paperwork, all participants were administered the Mullen Scales of Early Learning (MSEL). In the second meeting, all components of health were administered to study participants one week prior to intervention commencement. Upon arrival research participants were paired with their instructional coach and were shown a picture schedule outlining each of the stations to be completed. The stations were set up around the perimeter of a large gymnasium; instructors were encouraged to allow the participant to select the order of activities. Each station was equipped with stickers and food reinforcers that were awarded (if needed) at the completion of each activity. Stations included height, weight and waist circumference, 20-m PACER, muscular strength and endurance, and ball and locomotor skills. To ensure minimal distractions within the gymnasium, participants were scheduled to arrive in a pre-arranged block of time to reduce the number of individuals in the gym at one time. Once all measures were completed, parents were provided the physical activity monitor along with instructions for adherence to wear time protocols. These procedures were operationalized again 1 week following the completion of the intervention.

Intervention

The intervention was originally designed as a two-year longitudinal intervention, where participants would have received dosage in six 12-week blocks. Pre and post measures were planned throughout the longitudinal intervention and would have resulted in a trajectory of change with 6 timepoints of measures. However, due to social distancing circumstances that arose with COVID-19, the methodology for the intervention was altered to a pre and post design consisting of 12, 1-h sessions per week. The intervention followed a consistent routine each day. All intervention sessions were conducted in a gymnasium in a large and public urban university located in Southeast Michigan. The primary focus of the intervention was on the acquisition and reinforcement of the 13 fundamental motor skills that are included in the TGMD-3. Given best practices in instructional methods for

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physical education (Michigan Fitness Foundation: Michigan's Exemplary Physical Education Curriculum 2002), two skills (1 locomotor and 1 ball) were selected each session as the primary focus.

The intervention included two different types of instructors; coaches who worked in 1:1 dyads with research participants, and lead teachers. All coaches were pre-service health and physical education teachers enrolled in an adapted physical education college course with an embedded practicum component. Their role primarily consisted of direct individualized instruction on motor behavior skills during individual, small and large group activity. For consistency, coaches remained paired with the same participant for each of the 12 sessions. Next, two lead teachers with Board Certified Behavioral Analysts (BCBA's) credentials were responsible for the management, timing and delivery of group direction. Moreover, once activities began, the lead teachers circulated to coach and participant dyads in order to provide feedback that promoted participant time on task.

5. 請以中文翻譯此篇研究的標題及摘要。(25%)

6. 請閱讀 Procedures 及 Intervention 內容，以中文重點摘錄重要內容。(25%)

試題隨卷繳回