

題號： 140

國立臺灣大學 112 學年度碩士班招生考試試題

科目： 兒童物理治療學

題號：140

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【第一題，本題佔 35%】

請回答下列問題：

- (1) 請列出一項多面向兒童發展評估工具，並簡要說明其施測項目，與施測方法(15%)。
- (2) 請閱讀以下一篇有關於兒童論文摘要，請以中文 500 字簡述本研究的概況(10%)，請提出此研究的評估工具為何(10%)。

摘要出自：Pool D, Valentine J, Taylor NF, Bear N, Elliott C. Locomotor and robotic assistive gait training for children with cerebral palsy. *Dev Med Child Neurol.* 2021 Mar;63(3):328-335.

Aim: To determine if robotic assisted gait training (RAGT) using surface muscle electrical stimulation and locomotor training enhances mobility outcomes when compared to locomotor training alone in children with cerebral palsy (CP).
Method: Forty children (18 females, 22 males; mean age 8y 1mo, SD 2y 1mo; range 5y 1mo-12y 11mo) with CP in Gross Motor Function Classification System levels (GMFCS) III, IV, and V were randomly assigned to the RAGT and locomotor training (RAGT+LT) group or locomotor training only group (dosage for both: three 1-hour sessions a week for 6 weeks). Outcomes were assessed at baseline T1 (week 0), post-treatment T2 (week 6), and retention T3 (week 26). The primary outcome measure was the Goal Attainment Scale. Secondary outcome measures included the 10-metre walk test, children's functional independence measure mobility and self-care domain, the Canadian Occupational Performance Measure, and the Gross Motor Function Measure. **Results:** There were no significant differences between the groups for both the primary and secondary outcome measures. All participants completed the intervention in their original group allocation. There were no reported adverse events. **Interpretation:** The addition of RAGT to locomotor training does not significantly improve motor outcomes in children with CP in GMFCS levels III, IV, and V. Future studies could investigate health and well-being outcomes after locomotor training. **What this paper adds:** Marginally ambulant and non-ambulant children with cerebral palsy can participate in locomotor training. Robotic assisted gait training when added to locomotor training does not appear to be any more effective than locomotor training alone.

【第二題，本題佔 30%】

有位矯正年齡八個月大的早產兒男生，住院期未罹患嚴重腦部損傷，但是直至孕後週數 36 週尚須使用微量氧氣。母親主訴孩子在扶站時，會墊腳尖，且情緒易激動。乃經新生兒科門診轉介至物理治療中心進行發展評估與介入。你是他的小兒物理治療師，經面談了解，該名早產兒曾經在矯正年齡 3-6 個月期間進行多次輔以達治療(Vojta therapy)。再經發展檢查發現，該名個案並無肌肉張力異常，各種姿勢下僅站立動作項目有落後現象；至於給予身體觸摸時，容易出現生氣反應。請根據以上個案狀況回答以下問題：

- (1) 你懷疑輔以達治療與以上發展現象可能有關，希望應用實證物理治療的方法來了解『早產兒在嬰兒時期是否適合使用輔以達治療？』之議題，以提供家長適切的協助，請你以此案例敘述如何進行實證物理治療的步驟(15%)。
- (2) 請以此個案的狀況為基礎，設計一項最高等級品質的實驗，以探討早產兒的輔以達治療使用與動作及感知情緒發展間的關係(15%)。

【第三題，本題佔 35%】

請閱讀以下論文，包含摘要、及研究結果，並回答以下問題：

- (1) 研究中發展的 Object Permanence Scale (OPS)，是一種測量何種發展能力的工具(參考 Table 2)，請簡要對此評量內容說明(10%)。
- (2) 請說明 Table 3、figure 1、figure 2，此三個圖表呈現的重要結果為何？(15%)
- (3) 若臨床上治療一位生理年齡 10 個月大、動作發展年齡約 6 個月大的兒童，根據這篇研究結果的應用，設計一個可行的介入計畫，以及如何測量療效(10%)。

論文出自：An M, Marcinowski EC, Hsu LY, Stankus J, Jancart KL, Lobo MA, Dusing SC, McCoy SW, Bovaird JA, Willett S, Harbourne RT. Object Permanence and the Relationship to Sitting Development in Infants With Motor Delays.

見背面

Pediatr Phys Ther. 2022 Jul 1;34(3):309-316.

Abstract

Purpose: This study examines how object permanence develops in infants with motor delays (MD) compared to infants with typical development (TD) and in relation to sitting skill.

Methods: 56 infants with MD (mean age = 10 months) and 36 with TD (mean age = 5.7 months) were assessed at baseline then 1.5-, 3- and 6-months post-baseline. A scale was developed to measure object permanence (OPS), the Gross Motor Function Measure sitting subsection (GMFM-SS), and the Bayley Scales of Infant and Toddler Development, Third Edition (BayleyIII) were administered.

Results: Inter-rater reliability of the OPS was excellent (ICC=0.92), and correlation between the OPS and Bayley-III cognitive scores was moderately positive. Compared to TD, infants with MD were delayed in development of object permanence but demonstrated increased understanding over time and as sitting skills improved.

Conclusion: In children with MD, object permanence, as quantified by the OPS, emerges in conjunction with sitting skill.

Result

Descriptive statistics of the OPS scores are presented in Table 3. When infants enrolled in the study, the development of object permanence skills varied from 0 (no response to a moving object) to 10 (find an object after double visible displacements). On average at baseline, infants in both groups noticed the disappearance of a toy and attempted to retrieve the toy dropped inside a container (OPS score of 4). The scores on the OPS increased in both groups over 6 months. On average, at the 6-month follow up assessment, infants with MD were able to find a toy completely covered with a washcloth (OPS score of 6). Infants with TD were able to go one step further and find a toy completely covered in one of two identical washcloths (OPS score of 7).

Inter-rater reliability and validity The intra-class correlation coefficient, ICC (2, 1) was 0.92 (95% CI: 0.84-0.96), indicating excellent inter-rater reliability for the OPS scoring. The correlation between the OPS and the Bayley-III cognition scores in infants with MD, correlation r coefficient was 0.554 (p <0.05). However, as infants entered the study when they had the ability to sit, infants with MD were significantly older than infants with TD (mean age at baseline = 5.7 months in infants with TD and 10.2 months in infants with MD, p < 0.001, Table 1). The finding suggests that development of object permanence as well as emergence of sitting were delayed by approximately 5 months in infants with MD compared to infants with TD.

Progression of object permanence in infants with MD as compared with infants with TD The Friedman test showed a significant increase in OPS score over time: for infants with MD, $\chi^2(3, n=47)=19.91, p < 0.001$ at all 4 assessment visits. The OPS scores increased as sitting skill increased in infants with MD (Figure 2).

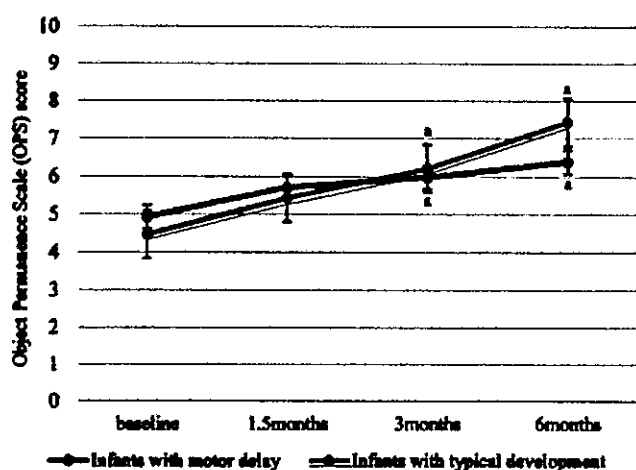


Fig. 1. Progression of object permanence in infants with motor delays as compared with infants developing typically. *Significantly higher OPS score compared with baseline score (P < .008). Bars represent standard errors of the mean.

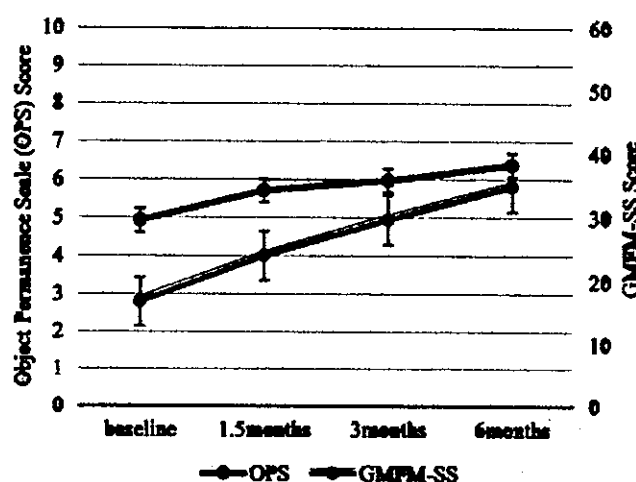


Fig. 2. Progression of object permanence in relation to sitting development in infants with motor delays. GMFM-SS Indicates Gross Motor Function Measure sitting subsection. Bars represent standard errors of the mean.

TABLE 2
 Description of Tasks of Object Permanence Scale and Scoring Criteria^a

| Task Description | Score |
|--|--|
| 1. Hold a toy at infant's eye level. Make sure that the infant is looking at the toy. Move the toy to the left and right sides of the infant (at least 45°) and observe whether the infant is tracking the toy. | <p><i>Score of 0:</i> Infant does not look at the toy when given visual cue or auditory cue to follow toy.</p> <p><i>Score of 1:</i> Infant looks at the toy in one location, then shifts gaze to new location to find the toy when the toy is moved 45° to side or vertically.</p> <p><i>Score of 2:</i> Infant reorients body part other than head to gaze at moved toy when toy shifted in space as in previous item.</p> <p><i>Score of 3:</i> Infant reorients body posture to follow moving toy of interest.</p> |
| 2. Place a wide nontransparent container in front of the infant and then place a toy inside the container. Make sure that the infant looks at the toy and put the toy in the container. | <i>Score of 4:</i> The infant looks inside of the container and attempts to retrieve the toy dropped inside. |
| 3. Put one washcloth on the table. Show the toy to the infant and make sure that the infant is watching the toy. Hide the toy completely under the washcloth. Observe whether the infant retrieves the toy by pulling the washcloth off. If the infant does not do this, repeat the same procedure with the half of the toy visible from underneath the washcloth. | <p><i>Score of 5:</i> Pulls cloth off the toy after watching cloth being placed and the toy partially visible.</p> <p><i>Score of 6:</i> Pulls cloth off the toy after watching the toy being slid under cloth.</p> |
| 4. Put 2 identical washcloths on the table (not overlapping). Show the toy to the infant and make sure that the infant is watching. Hide the toy under one of the washcloths. Observe whether the infant retrieves the toy by pulling off the washcloth. | <i>Score of 7:</i> Pulls cloth off the toy after watching cloth being placed and toy completely covered, with identical cloth nearby. |
| 5. Put 2 identical cups on the table side by side. Show the toy to the infant and make sure that the infant is watching. Hide the toy under one of the cups. Observe whether the infant finds the toy. Perform the task 2 times (once under each of the left and right cups). If the infant failed on either side, perform the task again for both sides. | <i>Score of 8:</i> Infant finds toy hidden under 1 of 2 cups. |
| 6. Put 2 cups on the table side by side. Show the toy to the infant and make sure that the infant is watching. Hide the toy under one of the cups. Reverse the cups while the infant is watching. Observe whether the infant looks for the toy. Perform the task 2 times (left and right). If the infant failed on either side, perform the task again for both sides. | <i>Score of 9:</i> Infant finds the toy while hidden 1 of 2 cups when the cups are reversed after the toy is hidden. |
| 7. Put 2 cups on the table side by side. Show the toy to the infant and make sure that the infant is watching. Hide the toy under one of the cups. Remove the toy and hide it under the other cup while the infant is watching. Observe whether the infant looks for the toy. Perform the task 2 times (left and right). If the infant failed on either side, perform the task again for both sides. | <i>Score of 10:</i> Double visual displacement used as the toy is hidden under one cup, removed and hidden a second time under the second cup. |

^aThe materials for the assessment: 1 table and 1 chair, 1 small toy, 1 wide nontransparent container (5-in high), 2 identical washcloths (8 in × 8 in), and 2 identical nontransparent cups.

TABLE 3
 Descriptive Statistics for Object Permanence Scale Score at Each Assessment

| | Infants With Motor Delays | | | Infants With Typical Development | | | P |
|----------|---------------------------|-----------|-----------------|----------------------------------|-----------|-----------------|------|
| | N | Mean (SD) | Minimum-Maximum | N | Mean (SD) | Minimum-Maximum | |
| Baseline | 56 | 4.9 (2.8) | 0-10 | 34 | 4.5 (1.5) | 1-7 | .277 |
| 1.5 mos | 51 | 5.7 (2.7) | 0-10 | 35 | 5.4 (1.8) | 2-9 | .307 |
| 3 mo | 51 | 6.0 (2.7) | 0-10 | 33 | 6.2 (2.0) | 2-10 | .981 |
| 6 mo | 49 | 6.4 (2.5) | 1-10 | 32 | 7.4 (1.8) | 4-10 | .075 |