

Cognitive Orientation to daily Occupational Performance (CO-OP) to improve occupational performance goals for children with executive function deficits after acquired brain injury



Lebrault H.^{1,2,3}, OT-PhD ; Martini R.⁴, OT-PhD ; Manolov R. ⁵, PhD; Chavanne C.¹, OT; Krasny-Pacini A.^{6,7,8}, MD-PhD; Chevignard M.^{1,2,3}, MD-PhD

¹Rehabilitation department for children with acquired brain injury, Hôpitaux Paris-Est Val-de-Marne; Saint-Maurice (France); ²Sorbonne Université, INSERM, CNRS, Laboratoire d'Imagerie Biomédicale, LIB, Paris (France); ³GRC 24, Handicap Moteur et Cognitif et Réadaptation (HaMCRé), Sorbonne Université, Paris (France); ⁴Occupational Therapy Program, School of Rehabilitation Sciences, Faculty of Health Sciences, University of Ottawa (Canada); ⁵Department of Social Psychology and Quantitative Psychology, University of Barcelona, Barcelona (Spain); ⁶Pôle de Médecine Physique et de Réadaptation, Institut Universitaire de Réadaptation Clemenceau, Strasbourg (France) ; ⁷Hôpitaux Universitaires de Strasbourg, Strasbourg (France); ⁸Unité INSERM 1114 Neuropsychologie Cognitive et Physiopathologie De La Schizophrénie, Université de Strasbourg, Strasbourg (France)

INTRODUCTION

Childhood acquired brain injury (ABI) is a leading cause of death and lifelong disability. Executive functions (EF) deficits are frequent and negatively impact participation in many activities of daily living. Despite the need, there are few validated interventions methods for improving EF. Challenges include transferring session-learned skills to untrained daily activities. Key principles for effective intervention involve engaging parents and caregivers in cognitive coaching and adopting ecological, context-sensitive approaches. Cognitive Orientation to daily Occupational Performance (CO-OP) is an intervention that incorporates these principles. CO-OP is task-oriented, helping individuals solve performance-related problems using metacognitive strategies. Its effectiveness has been demonstrated across various populations.

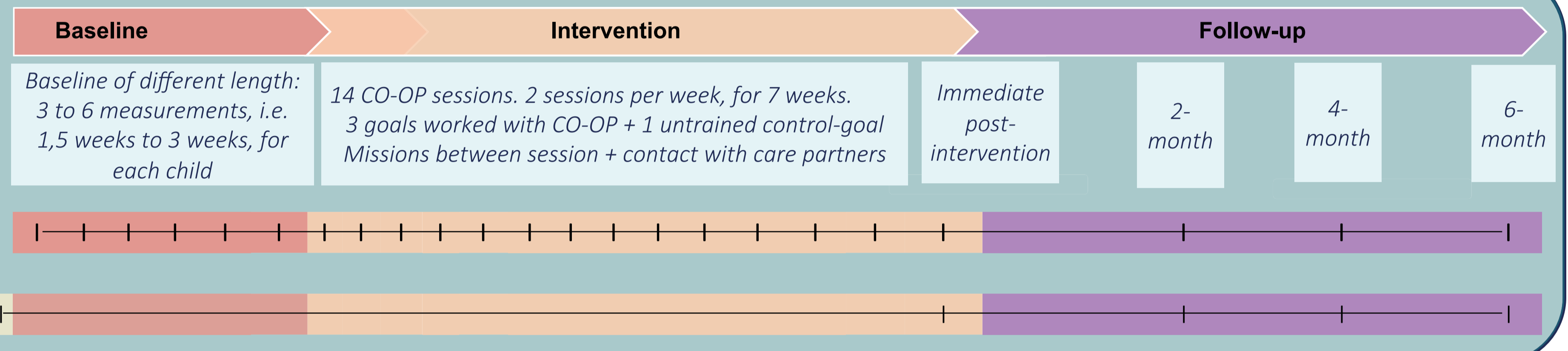
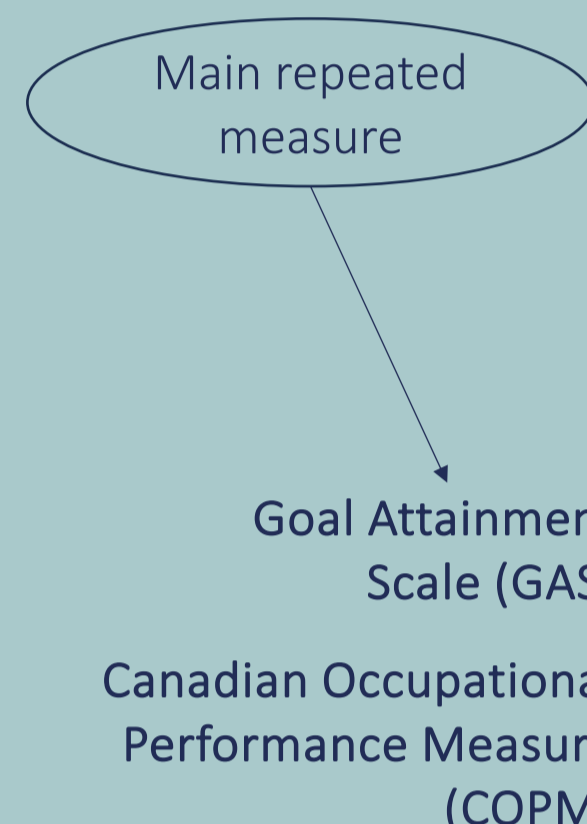
However, research on CO-OP's use in children with cognitive deficits post-ABI is limited. While promising results have been seen in adults with executive dysfunction post-ABI, these cannot be generalized to younger populations due to their ongoing EF and metacognition development. The current study follows up on the findings of our pilot study (which showed positive results) to determine the effectiveness of the CO-OP approach in improving occupational performance goals in young people with EF deficits after an ABI.

OBJECTIVE

To evaluate the improvement in occupational performance (= the achievement of the goals the participants have chosen to improve, as assessed by the Goal Attainment Scale, GAS, and the Canadian Occupational Performance Measure, COPM) following CO-OP intervention.

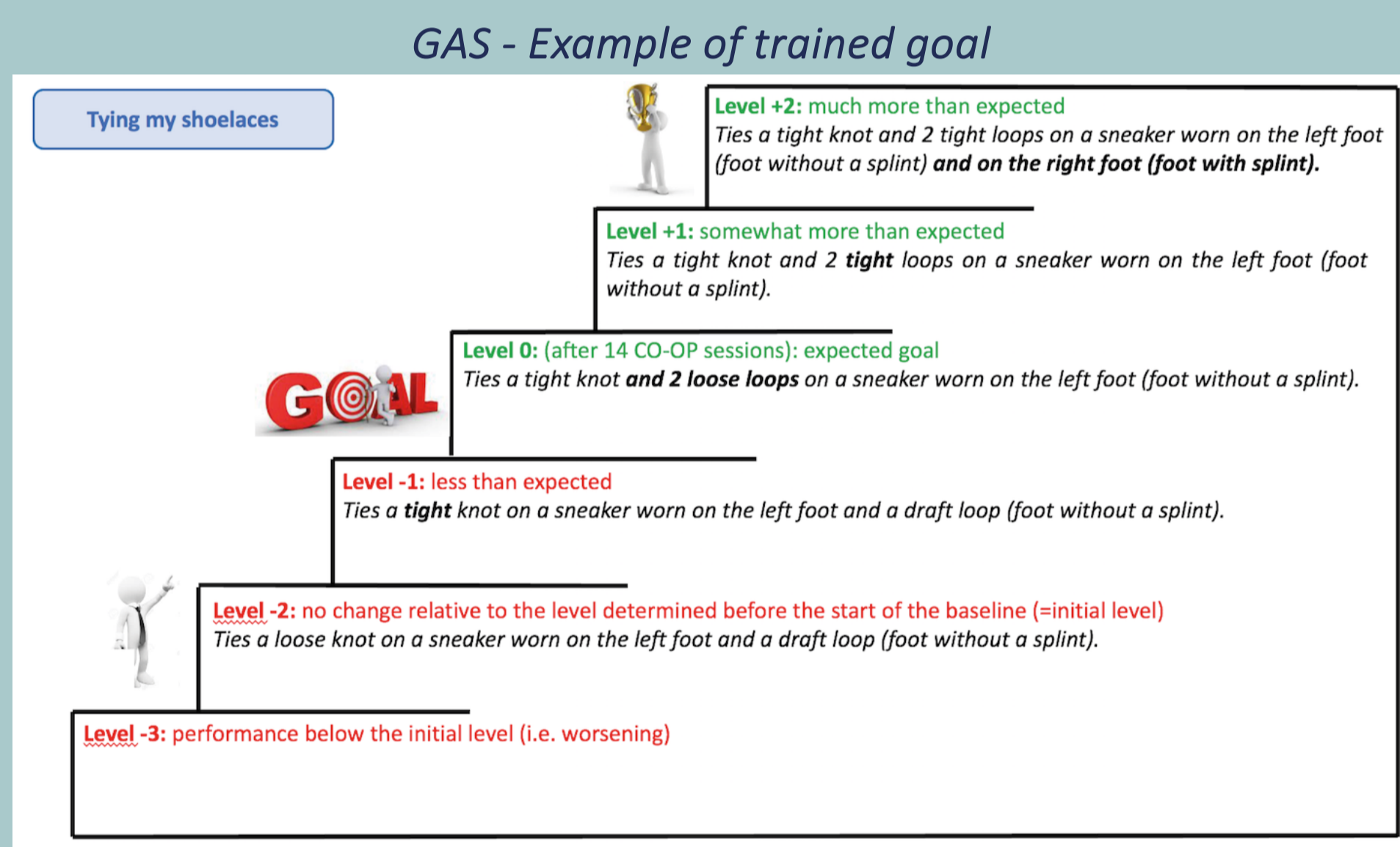
METHODS

- ✓ Replicated, randomized, Single-Case Experimental Design (SCED) with multiple baselines across individuals and behaviours (goals).
- ✓ The first original SCED (n=4) was replicated with two clusters (i.e. different participants, different settings, different clinicians).

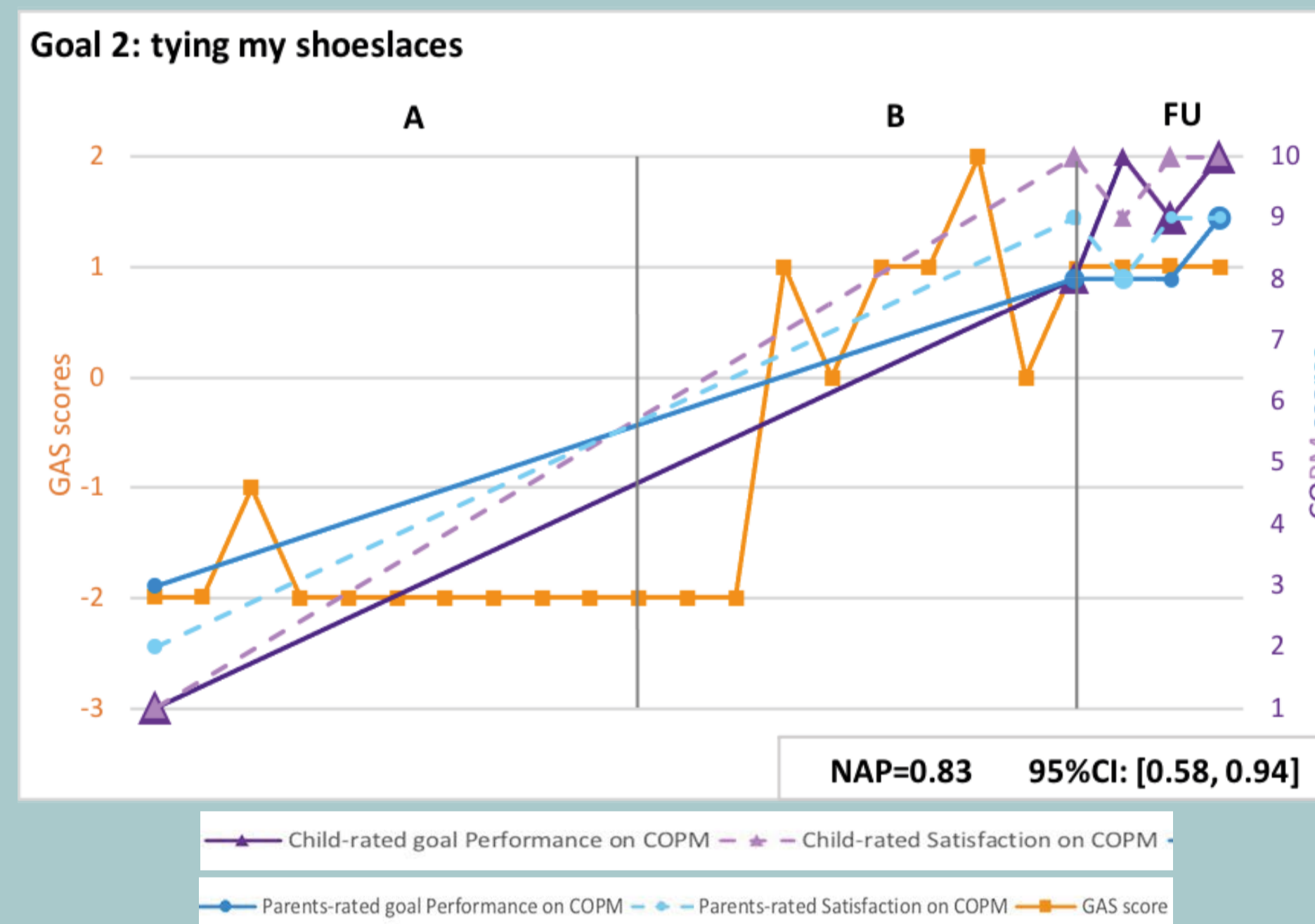


RESULTS

12 participants, 8-16 years-old



Evolution of GAS and COPM scores – Example of a trained goal



Combined NAP p-values effect sizes

Combined NAP p-values effect size for the 12 goals worked on first, by the 12 participants	p=0.0002
Combined NAP p-values effect size for the 12 goals worked on second, by the 12 participants	p=0.0005
Combined NAP p-values effect size for the 12 goals worked on third, by the 12 participants	p<0.0001
Combined NAP p-values effect size for the 12 untrained control- goals, by the 12 participants	p=0.09

NAP=Non Overlapping of All Pairs

GAS: statistically significant improvements for 26 of the 35 trained goals.
COPM: perceived occupational performance and satisfaction improved significantly for the trained goals: 30/35 goals for participants' performance and satisfaction; 26/31 goals for parents' performance; 24/31 goals for parents' satisfaction.

Significant statistical results

- Non-Overlapping of All Pairs (NAP)
- Combined NAP p-values effect sizes
- Multilevel test

DISCUSSION

For most goals, the intervention effect, calculated using different measures, showed statistically significant improvement in occupational performance. These improvements in performance were still evident at the follow-up phase, indicating that the intervention effects were maintained over time.

The significant improvements reported in this study suggest that teaching participants how to problem-solve issues in occupational performance using CO-OP is a beneficial approach. These results confirm previous research (Missiuna et al., 2010; Hunt et al., 2019; Jackman et al., 2018; Lebrault et al., 2021) which showed that participants with ABI can improve on self-selected tasks using a CO-OP approach.

Bjorklund (2011) noted that the development of EF, strategies, and problem-solving is a complex process that is often disrupted by ABI, as was the case with all participants included in this study. Metacognitive processes are immature in childhood and undergo protracted maturation, which can limit the use of metacognitive strategies in children and young people with severe cognitive deficits.
→ Despite these potential limitations, the CO-OP approach was effective for the participants in the study.

Camm et al. (2021) deplored the lack of studies with a follow-up phase, bearing in mind that the primary objective of rehabilitation is its impact on real life (Stubberud, and al., 2021).
→ In the current study, positive results were maintained throughout the 6-month follow-up post-intervention, indicating that the tasks were acquired durably. Some goals even continued to improve during the follow-up phase, suggesting that participants practiced these occupations in daily life outside the intervention sessions and probably internalized the strategy used.

While previous studies suggested that metacognitive approaches are not appropriate for children with severe impairments (Stubberud et al., 2021; Krasny-Pacini et al., 2014), all participants in the current study can be described as having severe EF profiles, yet they made significant progress.

While the quality of the family environment can moderate the deleterious effects of ABI on EF (Durish et al., 2018) unfavourable family circumstances can also exacerbate these effects (Chavez-Arana et al., 2018). In our group, many achieved their goals, but others had more contrasting results.
→ One explanation could be the influence of the family environment.

PERSPECTIVES AND CONCLUSION

- ✓ The findings of this SCED study suggest that the CO-OP approach may be effective for children and young people with EF deficits after severe ABI.
- ✓ Not only do the findings show significant improvements in achieving personal goals and perceived occupational performance and satisfaction, these results were also maintained at the follow-up phase, up to 6 months after the intervention.
- ✓ Further studies are required to confirm these findings and recommendations because of the complexity of deficits in EF (and eventual associated disorders) and their expression.

Read our article in DMCN! (open access)

