# ADVANCING COGNITIVE ASSESSMENTS: A SCOPING REVIEW OF COMPUTERIZED TOOLS FOR CHILDREN WITH DEVELOPMENTAL DISABILITIES

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## Background

Cognitive function (CF) plays a crucial role in daily activities and rehabilitation outcomes for children with developmental disabilities (CDD). Evaluating CF in this population is challenging due to the diversity of disabilities and limitations in current assessment tools. Over the past decade, computerized cognitive assessments (CCAs) have emerged as an innovative alternative, offering adaptive and accessible methods.

## Methods

This scoping review included experimental studies utilizing CCAs to assess CF in children with CDD. Literature was searched in PubMed, Scopus, ScienceDirect, and Web of Science databases.
Inclusion criteria focused on studies involving CCAs, targeting CF domains such as executive functions and learning/memory, and involving participants diagnosed with CDD. A total of 25 articles covering 19 CCAs and 2455 participants were included.

## Results

The review identified that 80% of CCAs were computer- or tablet-based, frequently assessing executive functions (see *Fig.1*). Innovations like brain-computer interfaces, eye tracking, and virtual reality were utilized in 6 CCAs.
Psychometric properties were reported in 42.1% of studies, highlighting gaps in reliability and validity reporting. Comprehensive tools like the CANTAB and WebNeuro were noted for their versatility in assessing multiple CF domains.

## Conclusions

CCAs demonstrate promise as tools for assessing CF in CDD, offering benefits such as scalability and user-friendliness.

However, better reporting on psychometric properties and administration protocols is essential to improve their application in clinical and research contexts.

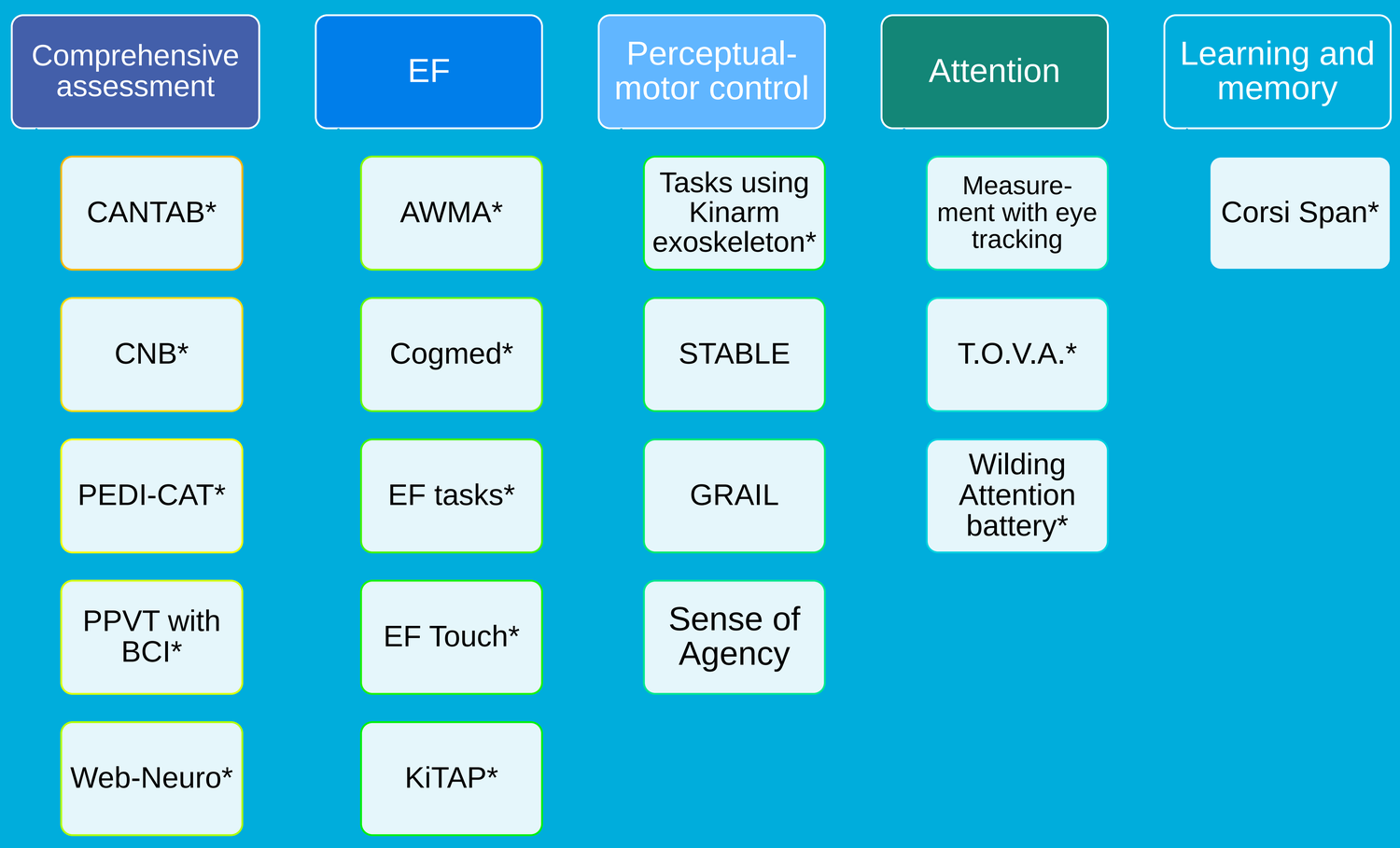



FIGURE 1. OVERVIEW OF CCAS FROM THE SELECTED ARTICLES IN TERMS OF THE DOMAIN OF COGNITIVE FUNCTION
AWMA – Automated Working Memory Assessment; CANTAB – Cambridge Neuropsychological Test Automated Battery; CNB – Computerized Neurocognitive Battery; EF – executive function; GRAIL – The Gait Real-time Analysis Interactive Lab; Kinarm – Kinesiological Instrument for Normal and Altered Reaching Movement; KiTAP – Kiddie Test of Attentional Performance; STABLE – STability And Balance Learning Environment; T.O.V.A – Test of Variables of Attention; PEDI-CAT – Pediatric Evaluation of Disability Inventory Computer Adaptive Test; PPVT with BCI – Peabody Picture Vocabulary Test with a brain-computer interface; * - CCAs with reported psychometric properties

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