

Outcome Measure	Contingency Naming Test (CNT)
Sensitivity to Change	Yes
Population	Paediatrics
Domain	Neuropsychological Impairment
Type of Measure	Objective Assessment
ICF-Code/s	B1
Description	<p>The Contingency Naming Test (CNT) is a test for the assessment of the aspects of executive functions, which deals with concentration, cognitive flexibility and working memory. The CNT is estimated to be sensitive to the common brain-related maturation as well as brain damage and may be advantageously used in children with acquired brain injury, intellectual disabilities, developmental disabilities or specific cognitive difficulties identifying the executive difficulties in children between 7 and 15 years. It consists of four trials of increasing difficulty that are applied to a stimulus set of 9 practice items and 27 test items. Each item consists of a circle, triangle, or square drawn in bold black ink. Each of these “outer” shapes contains a smaller shape also outlined in black. The entire outer shape (including the inner shape) is completely coloured in (in either green, pink, or blue). Some of the items include a backwards arrow that appears directly above the outer shape. All of the items are named during each of three subtests, by either their outer shape or colour.</p> <p>The CNT is sensitive and useful in testing the function of the frontal lobe i.e., speed of retrieving names and mental set shifting with changing rules / instructions. The first two trials are simple as they involve automatic naming of colours, both of which requires making of a decision under a contingency rule in the third and fourth trial. In trial 1, children are asked to name the colours of the shapes while in trial 2, the child names the external shape. In trial 3, which is a switching task, children are asked to name the colour of the shape if the internal and external shapes matched and to name the external shape if the shapes didn’t match. Finally, in trial 4 children retain the rules of trial 3 but the rules are reversed i.e., if the internal and external shapes match, the shape is to be named and if they don’t, the colour is to be named. Due to the complexity of the task, total errors, time and efficiency was computed for the first three tasks separately and then again for all the four tasks.</p> <p>The CNT is suitable in cases where a more precise identification of concentration, processing speed for shape / colour recognition, working memory and cognitive flexibility is needed. The test can therefore be used in conjunction with cognitive disorders of mental as well as physical nature and gives a good insight into, first, whether there is cognitive disturbances and at what level of complexity that is most concisely (due to the increasing difficulty).</p>

<p>Properties</p>	<p>Ages: for children aged 6 to 16, although can be used in older adolescents</p> <p>Administration Time: ~ 5 minutes</p> <p>Description: assesses response switching with four different tasks. Each task has a different rule by which the subject must identify coloured shapes (i.e. according to its colour or to its shape) – tests executive functions and cognitive flexibility</p> <p>Scoring: A cognitive flexibility index, numbers of errors and self-corrections, and response latency are scored</p> <p>Administration: The child is presented with a stimulus passed a series of geometric shapes with different colours, then he / she must name either the shape or the colour from four different principles. The principles are initially very simple and only tests of concentration and shape / colour recognition coupled with language generation. The principles will be continuously more complex and changes from simple concentration to provide a measure of working memory. Since the principles constantly changing, the test beyond good measure of concentration, processing speed for shape / colour recognition and working memory, and also a measure of cognitive flexibility and adaptability in terms of being able to switch between rules and strategies.</p> <p>Psychometric Properties:</p> <p>The CNT is tested on 381 healthy Australian, Canadian and American children, and test clinical validity is also tested on 111 children of the same origin with acquired brain injury and pilot tested in Danish children, also with acquired brain injury. The immediate assessment to be applied to Danish children without further adaptation and with the available standards.</p> <p>The CNT has good sensitivity to TBI in children, and its availability in the public domain. The CNT has been used to study short and long term outcomes of moderate to severe TBI in children and it has been shown to predict social problem-solving skills.</p>
<p>Advantages</p>	<p>“The CNT was selected as a Supplemental measure based on its good psychometric features, its sensitivity to TBI in children, and its availability in the public domain. The CNT has been used to study short and long term outcomes of moderate to severe TBI in children and it has been shown to predict social problem-solving skills.” – McCauley et al. 2012.</p>
<p>Disadvantages</p>	<p>The Contingency Naming Test (CNT) was initially designed to assess aspects of executive functioning, such as processing speed and response inhibition, in children. The measure has shown initial utility in identifying differences in executive function among child clinical groups; however, there is an absence of adequate psychometric data for use with adults.</p>

Additional Information	Some tests such as CNT may have been difficult to all children and thus the lack of significant differences should be interpreted carefully.
Reviewers	Vicki Anderson Cathy Catroppa

References

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Anderson, V., Anderson, P., Northam, E., Jacobs, R., and Mikiewicz, O. (2002). Relationships between cognitive and behavioral measures of executive function in children with brain disease. *Child Neuropsychol* 8(4), 231-240.

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