

## Video Article

# Practical Methodology of Cognitive Tasks within a Navigational Assessment

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## Abstract

This paper describes an approach for measuring navigation accuracy relative to cognitive skills. The methodology behind the assessment will thus be clearly outlined in a step-by-step manner. Navigational skills are important when trying to find symbols within a speech-generating device (SGD) that has a dynamic screen and taxonomical organization. The following skills have been found to impact children's ability to find symbols when navigating within the levels of an SGD: sustained attention, categorization, cognitive flexibility, and fluid reasoning<sup>1,2</sup>. According to past studies, working memory was not correlated with navigation<sup>1,2</sup>.

The materials needed for this method include a computerized tablet, an augmentative and alternative communication application, a booklet of symbols, and the Leiter International Performance Scale-Revised (Leiter-R)<sup>3</sup>. This method has been used in two previous studies. Robillard, Mayer-Crittenden, Roy-Charland, Minor-Corriveau and Bélanger<sup>1</sup> assessed typically developing children, while Rondeau, Robillard and Roy-Charland<sup>2</sup> assessed children and adolescents with a diagnosis of Autism Spectrum Disorder. The direct observation of this method will facilitate the replication of this study for researchers. It will also help clinicians that work with children who have complex communication needs to determine the children's ability to navigate an SGD with taxonomical categorization.

## Video Link

The video component of this article can be found at <http://www.jove.com/video/52286/>

## Introduction

The methodology used to assess cognitive and navigational skills can vary widely. Few studies have been published regarding cognitive and navigational skills. Previously, Wallace, Hux, and Beukelman (2010) studied the impact of cognition on navigation with adults who experienced a traumatic brain injury<sup>4</sup>. They found that cognitive flexibility impacted navigational skills for this population. The method described in this paper conducted by Robillard, Mayer-Crittenden, Roy-Charland, Minor-Corriveau and Bélanger has been published in 2013<sup>1</sup>. Rondeau, Robillard and Roy-Charland also used this method in a similar study<sup>2</sup>. For the purpose of this paper, step-by-step instructions with visual supports will demonstrate the methodology used in order to encourage duplication of this technique with other populations for research purposes, and to support clinicians who want to assess navigational and cognitive skills for clients who have complex communication needs.

Speech-generating devices (SGD) produce an electronic voice using a synthesizer and can have dynamic levels with links that allow the user to access new words by changing levels (*i.e.* to change from a page of symbols to another)<sup>5,6</sup>. The ability to navigate between these levels is required in order to find symbols within the multiple levels of an SGD<sup>6,7</sup>. The importance of cognitive skills in the ability to navigate the levels of an SGD has been demonstrated<sup>1,2,4</sup>. Results of a study that analyzed the impact of language abilities on navigational skills revealed that language skills were not a good predictor of navigational skills among children<sup>8</sup>. By having a better understanding of the cognitive factors that can impact navigation, clinicians can offer a more reliable assessment of children with complex communication needs. The cognitive factors that will be addressed in this study are: sustained attention, categorization, cognitive flexibility and fluid reasoning. See Robillard and collaborators for a description of these cognitive factors<sup>1</sup>.

Since very few studies have looked at the impact of cognitive factors on navigation, an assessment protocol has not yet been put into practice. Over the years, other fields in speech-language pathology have established assessment batteries in order to better identify children in need of those services. For example, it is a well-known fact that non-word repetition and sentence imitation, two tasks that rely heavily on verbal working memory, along with select language assessment tools, can successfully identify children with language impairments<sup>9-14</sup>. However, in the field of augmentative and alternative communication (AAC), very little attention has been given to the relation between cognition and the ability to navigate an AAC device. Even less attention has been given to the development of a systematic method to follow. Very few tools exist for the assessment of navigation skills in children. Since there exist a variety of assessment tools that can be used to assess nonlinguistic cognitive skills, it is understandable that determining which tools or tasks to use could be very overwhelming for a clinician<sup>15</sup>. Clinicians commonly use feature matching with individuals who use AAC. It involves matching the person's abilities to the design features of the SGD. It is therefore important that clinicians are best able to match the cognitive skill levels and the person's navigation abilities to the appropriate device.