

RESEARCH ARTICLE

Exploring the Impact of Cognition on Young Children's Ability to Navigate a Speech-Generating Device

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Abstract

This study examined the impact of cognition on young children's ability to navigate a speech-generating device (SGD) with dynamic paging. Knowledge of which cognitive factors impact navigational skills could help clinicians select the most appropriate SGD for children who have complex communication needs. A total of 65 typically developing children aged 48–77 months were assessed using the Leiter International Performance Scale-Revised (Leiter-R) and the Automated Working Memory Assessment (AWMA). Although significant correlations were found between the ability to navigate an SGD (using a taxonomic organization) and all cognitive factors except for cognitive flexibility, a stepwise linear regression revealed that sustained attention, categorization, and fluid reasoning were the most pragmatic set of factors to predict navigational skills. Future studies are needed to further understand the factors that impact children's navigational skills.

Keywords: *Augmentative and alternative communication (AAC); Speech-generating device (SGD); Navigation; Cognition; Children*

Introduction

One of the key components in the intervention of young children who have complex communication needs is the selection of the most suitable augmentative and alternative communication (AAC) system (Light & Drager, 2007). Indeed, selecting the appropriate speech-generating device (SGD) for a young child can be challenging, especially when deciding between dynamic paging and static overlays. The arrival of new mobile technologies has rendered this process even more complex, as more options with dynamic paging are now readily available. Good navigational skills are required to find vocabulary within SGDs that have dynamic screens (Drager & Light, 2006; Reichle & Drager, 2010). Efficient use of SGDs by young children, therefore, rests on their ability to retrieve the appropriate vocabulary (Drager & Light, 2006; Wilkinson & Coombs, 2010). Finding symbols embedded within many levels of a dynamic screen can pose a particular challenge for some children, while others seem to learn to navigate with ease and without much training. Knowing how cognitive functions affect navigation could help

clinicians during the assessment and device selection process. Wallace, Hux, and Beukelman (2010) found that cognitive flexibility impacts navigation in adults who experienced a traumatic brain injury. The influence of cognition on navigation in children remains unknown. The present study analyzed the effect of various cognitive factors (sustained attention, categorization, cognitive flexibility, fluid reasoning and working memory) on young children's ability to navigate an SGD with dynamic paging. The goal was to decipher which cognitive factors have an impact on navigation and which can better predict navigational success (see Table I for a description of the cognitive factors).

SGDs produce an electronic voice using a synthesizer or recorded speech (Lloyd, Fuller, & Arvidson, 1997). They allow active interactions by enabling a person with complex communication needs to participate in conversations (Blischak, Lombardino, & Dyson, 2003). Due to a combination of advances in empirical research and technology, there is renewed interest in the development of technology for AAC purposes (e.g., Higginbotham & Jacobs, 2011; Wilkinson & Hennig, 2007). This has contributed to the rapid evolution of SGDs, which