Title: Cognitive and Navigational Skills of Children who have Complex Communication Needs

Extended abstract

The present study examined the cognitive skills required to navigate a speech-generating device (SGD) with dynamic paging and a taxonomical organization, among children and adolescents (ages 3-21) who have complex communication needs (CCN). Just like their typically developing peers, children who have CCN have a need and a right to socialise, share their feelings and ideas, as well as ask and answer questions (Robillard, Mayer-Crittenden, Roy-Charland, Mayer-Crittenden, & Bélanger, 2013). Without AAC intervention, children who have CCN could experience difficulties in terms of learning, literacy and socialisation (Robillard et al., 2013).

SGD’s produce an electronic voice output allowing an individual who has CCN to actively participate in conversations (Blischak, Lombardino, & Dyson, 2003). SGDs with dynamic paging are equipped with a screen that can display new symbols/vocabulary by liking different pages (Reichle & Drager, 2010). Words are organized taxonomically when they are programmed in hierarchical categories within an SGD (Light et al., 2004). Good navigational skills are required to efficiently locate desired vocabulary programmed within SGDs with dynamic paging and a taxonomical organization (Reichle & Drager, 2010). Some individuals have difficulty understanding the relationship between symbols found on the main screen of the SGD, and those found on subsequent pages. In such situations, communication efficiency is reduced (Light & Drager, 2007; Robillard et al., 2013; Wallace, Hux, & Beukleman, 2010), and the user can become frustrated and even abandon the device (Light & Drager, 2007).

Effective AAC intervention with this population relies on the selection of the most appropriate SGD (Light & Drager, 2007; Robillard et al., 2013). However, this can be a challenging task for clinicians, especially because of the array of systems that are now readily available (i.e. dynamic paging and static overlays) (Robillard et al., 2013). Although many individuals seem to be drawn to high-tech devices, they are not always the most suitable choice when considering the user’s cognitive abilities (Wilkinson & Hennig, 2007). If a user struggles while navigating within an SGD, it may be necessary to reduce the cognitive and visual demands by decreasing the number of symbols per page, or by using another communication modality (Wilkinson & Hennig, 2007).

Previous studies have underlined the implication of cognitive abilities during navigation (i.e. attention, categorisation, reasoning etc.), and more interestingly, the fact that they can predict navigational success (Robillard et al., 2013; Wallace, Hux, & Beukelman, 2010). However, the role of specific cognitive abilities differs according to the population studied (Robillard et al., 2013; Wallace, Hux, & Beukelman, 2010). Many questions regarding the selection of an SGD for children who have CCN have not yet been answered (Robillard et al.,
In fact, no study has examined the cognitive demands associated with navigating an SGD among children who have CCN. Seeing as children who have CCN depend on AAC to meet their daily communication needs, it was imperative to conduct a study among this population.

With this in mind, the goal of this study was to identify the cognitive factors that can best predict navigational success among children who have CCN. Given that children with CCN represent a very heterogeneous group (i.e. various disorders, individual characteristics), they could respond very differently to a same AAC device (Thistle & Wilkinson, 2013).

The recruitment process began with approaching various speech-language pathologists, other health professionals and AAC Clinics in Northern Ontario (i.e. Greater Sudbury, North Bay and Sault Ste Marie), in order to identify clients that would be eligible to participate in this study. Families who were interested in participating contacted the researcher. In the current study, some participants had a congenital, neurological or acquired disorder (i.e cerebral palsy, autism), and some had a severe speech disorder such as apraxia.

The evaluation process included a navigational task and a cognitive assessment, and took approximately an hour and a half for each participant. To measure navigational success, an iPad with the Proloquo2Go application was used. The participants were also assessed using 7 subtests of the Leiter-3 (Roid, Miller, Pomplun, & Koch, 2013), a non-verbal cognitive test in which neither the researcher nor the child speaks during the assessment. The subtests included: Attention Sustained (sustained attention), Classification and Analogies (categorization), Figure Ground (cognitive flexibility), Form Completion (fluid reasoning), Sequential Order (fluid reasoning), Forward Memory (working memory) and Reverse Memory (working memory). Finally, relationships between navigation scores, age and the cognitive variables were examined using statistical analysis.

Preliminary results showed strong correlations between sustained attention (Attention Sustained), categorisation skills (Classification), and the ability to navigate an SGD. In other words, the higher the scores obtained in these cognitive subtests, the better the performance in navigation. The results obtained on the subtests of the Leiter-3 could be used to predict the user’s ability to navigate an SGD. The use of these subtests of the Leiter-3 could be an ideal evaluation tool to use in a clinical setting when working with children who have CCN, as it is a non-verbal test. The knowledge of the implication of cognition on the ability to navigate an SGD could help clinicians take an individualized approach during the device selection process for this population. This information could thus help clinicians be more efficient at selecting an appropriate SGD (Robillard et al., 2013). In return, this could essentially maximize the communication development of children who have CCN by allowing them to have active interactions. More in depth results will be presented at the conference.

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References


