

Semantic Cueing and Lexical Retrieval

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Abstract

Semantic cueing has been used by speech and language therapists, as a facilitatory method to stimulate word recall, in young children as well as adults having speech and language disorders, of neurogenic origin and otherwise. The therapist provides relevant and meaningful contextual information about the category of the word (fruits), or its attributes (red fruit, a red fruit that you cut with a knife before eating) or any other features (grows on a tree), as a prompt to recall the target word (apple). In children having language disorder (DLD), or adults with aphasia having word-finding difficulties, who have trouble accessing the complex neural network where concepts and experiences are stored, this technique helps organize the stored mental lexicon, for word retrieval.

Research supports semantic cueing as an effective technique for accuracy in word recall in comparison with phonological cues. Though efficacy of semantic cueing is dependent upon the type and severity of the language impairment, it is known to improve linguistic skills and communication in pediatric and adult population. Cueing can be very effective for vocabulary development in bi/multilingual children. Semantic Feature Analysis supports cueing as a method that reactivates weakened lexical-semantic neural connections, post brain-injury.

Keywords: semantic cues; lexical retrieval; prompts; vocabulary; children

1. Introduction

Children acquire language innately through experiences they gain from socio-communicative interactions and manipulations with people and objects around them. A stimulating and rich linguistic environment and typically developing neurobiological processes are essential. Babies acquire and internalize the meaning of words long before they can speak them (Novogrodsky & Kreiser, 2015). Understanding how children make sense of words' meanings is essential to language acquisition. Cognitive skills of attention, memory (recall and retrieval), visual and auditory discrimination, and judgement, are critical to this process.

The components of language form (phonology, morphology, syntax, prosody), content (meaning) and use (function) are interdependent and simultaneously acquired. Nouns are the first and most significant category of words acquired by young children. The vocabulary of Nelson's referential children consists of more nouns. Children use nouns to label objects and people around them (Alt et al., 2019; Nelson, 1981). They are also used for requests and making demands from people within the environment (Lieven et al., 1992). Adults' speech consisting of words, phrases and sentences often becomes the cues and prompts to support language acquisition in typically developing children.

The prototype theory explains that children establish a mental prototype of an object or person based on physical features, location or function. They can generalize the same prototypical features to more objects or persons in the same category. E.g. every round thing that can roll is a prototypical ball. The same elements may be applied to the fruit orange or apple as an overextension until the feature of eating the apple and orange becomes associated with the fruits (Cruse, 2014; Geeraerts, 1989, 2006; Lawry & Tang, 2008; Qin & Tang, 2014; Taylor, 2015).

Children identify the physical features of objects in terms of size, shape, colour, and use or function whilst discriminating their phonological features to name them. Younger babies can discriminate among more phonemes than older babies who lose this skill around 10-12 months, as the neural pathways for

the native language they hear in their environment get established. Babies can also discriminate prosodic features of stress and tone specific to their native language (Kuhl, 2004, 2010). Pre-school teachers have also used phonological (phonetic or phonemic) cues to facilitate children's early literacy skills. Although phonological cues make it easier to retrieve a word, semantic cues remain more useful in lexical development through early childhood (Culbertson et al., 2017; Mathur et al., 2020).

Children aged five and nine were compared with adults in a study by (Fallon et al., 2002) for their ability to identify the final word of an utterance in the presence of background noise. Children had more difficulty listening and understanding the utterances when the background noise was louder. The sentences with high context cues (*At the farm, I saw a cow*) were easier for the children than the sentences with low context cues (*She read about the cow*). But, regardless of age, all the participants of this study benefitted equally from contextual cues about the word. All participants were able to decode the word with similar accuracy when provided with a semantic cue about the picture. Children and adults who had difficulty understanding the speaker wearing a face mask (during Covid19) also had enhanced understanding sentences and words with high semantic cues, that tapped on prior phonological, lexical, and syntactic knowledge (Schwarz et al., 2022).

2. Use of Cues and Prompts in Speech-Language Therapy

The use of cues and prompts with children and adults having speech and language disorders, is found in the literature. Children with specific language impairment (SLI) or developmental language delay (DLD) may present longer latency periods for word retrieval. Research by (Novogrodsky & Kreiser, 2015) showed that semantic knowledge is essential for word retrieval. They said that children who were given semantic cues about the object's category or function had better word retrieval than children who were given morphological cues. E.g. I eat with a ____ (spoon), or This is a pet animal ____ (cat) would be easier than The girl is ____

(eating). These sentences display high cloze probability, that stimulates predictive speech processing, because it stimulates prior linguistic knowledge (Mathur et al., 2020; Soomro, 2022). Every object can be represented on paper through a semantically rich image. However, the image must be precise to enable a child to name it correctly. E.g. a picture of the moon or sun, when shown in the sky with clouds, is likely to elicit the word sky, whereas a picture of only the sun or the moon may produce the words sun and moon, respectively. However, if the child does not name the images spontaneously, but has semantic knowledge about them, then giving a cue that describes them might elicit the picture's name (Li et al., 2008).

In their extensive experiments, Goujon et al. (2007) have tried to determine word retrieval through contextual cueing, specifically for semantic categories have concluded that subtle learning experiences develop a semantic memory. When an individual cannot actively and immediately name a particular picture or object, semantic cues about its function, location or category may facilitate the retrieval process. In the case of a scene shown to an individual, the person may consciously or sub-consciously establish spatial relations or contextual relations about the semantic elements and categories of items in the scene. Appropriate cues about the images stimulate the past visual-cognitive experiences to retrieve the names of the things in the scene (Goujon et al., 2007).

Cueing is also integral to aphasia therapy, especially with anomia or word-finding difficulties. The speech clinician may provide phonemic or semantic cues for word retrieval. These cues may be faded as the naming difficulty improves (Bose et al., 2001). Several computer-based programs have now been developed to provide multi-sensory stimulation and visual and auditory cues for adult word-finding difficulties (Calder, 2008; Doesborgh et al., 2004).

2.1. Other Forms of Cueing

Tactual cues are used in a structured manner with childhood apraxia of speech (CAS) through the PROMPT (Prompts for Restructuring Oral Muscular Phonetic Targets) method. This evidence-based method of treating CAS uses tactile-kinesthetic-proprioceptive (TKP) cues around the mouth and face to stimulate and shape the movement of articulators for speech production. The PROMPT approach has also succeeded in adults with motor aphasia and speech apraxia post-stroke (Dale & Hayden, 2013).

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Credit authorship contribution statement

Amina Asif Siddiqui & Fatima Yousuf: Writing – original draft, **Dr Ayesha Butt** : Conceptualization, **Dr. Farheen Naz Anis & Dr. Tahmeena Tabish** Writing –review & editing; **Dr. Ayesha Butt & Dr. Cila Umat:** Supervision.

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