Infant Cognition as a Predictor of Language Development

Casey Ripplinger B.S.

Faculty Sponsor: Jenna Voss, PhD, CED, LSLS Cert AVEd

Abstract

Through everyday interactions with their caregivers, most infants readily acquire early communication that leads to the development of listening and spoken language. However, a child's cognitive abilities may predict their language acquisition trajectory and the complexity of language they ultimately achieve. This poster describes the cognitive skills which are known predictors of language acquisition. Furthermore, this poster offers suggested intervention activities which caregivers and professionals can utilize to enhance the development of language in young children.

Learning Outcomes

Participants will be able to:

1. Identify areas of cognition that have been linked to advanced language development in early childhood and beyond.
2. Inform professionals and caregivers about cognitive and language based assessments that act as predictor of linguistic concept acquisition and increased vocabulary inventory based on peer-reviewed, research studies.
3. Outline language centric activities that exercise cognitive areas that can be easily implemented and have been shown to contribute to advanced language development in young children.

Introduction

Attention and Memory play a key role in language development during an infant's first 12 months of life. Infants who possess superior cognition score better on language assessments of linguistic concepts. Several of the assessments mentioned in this poster have been shown to act as a predictor of future language performance in an infant's childhood years. Typically developing children are pre-wired to observe the world around them and actively seek human interaction. Caregivers can enhance a child's language development by introducing play-based activities that exercise a child's cognitive skills such as attention and memory.

Cognitive Areas Linked to Language Development

Attention

Infants utilize attention to engage and maintain focus during shared interactions and observe the communication of others. Infant tendencies in the following subcategories act as a predictor of expressive/receptive language performance in subsequent years.

Visual Attention

- Infants with shorter "look duration" and higher "shift rate" between two objects at 6-12 months perform higher on receptive language measures (Ball et al., 2022)

Shape Bias

- Infant competency of shape-bias is linked to increased object naming in the first 2 years of life.
- Infants that generalize objects to learned words based on shared features possess a higher capacity to encode spoken language.
- Infants who struggle to develop shape bias often have characteristics of delayed language development.

Joint Attention

- Infants who engage goal-based, shared interactions with caregiver support developed the ability to use Wh-questions to learn new information earlier than children who did not.
- This ultimately resulted in better receptive language performance at 36 months. (Nails et al., 2016)

Object Permanence

- Infants that utilize language to refer to objects that are not visible enhances their understanding of the physical world.
- In order to grasp this concept, infants utilize sustained attention to track the movements of an object to develop a deeper mental representation of their environment.

Memory

Memory plays a critical role in language acquisition of infants and can be utilized to predict future performance on language based tasks in early childhood. Infants who performed better in the following subcategories scored higher on language based assessments at 12 months and 36 months.

Short-term Memory

- Infants utilize short-term memory to immediately encode and store language information such as speech sounds, words, and phrases.
- Infants who performed better on STM tasks also scored better on tasks that targeted: sentence structure, pragmatic language, and vocabulary recall in the elementary school aged years.

Memory Consolidation

- Infants must encode new vocabulary and sentence structures. Once retained, infants can build upon these language areas.
- Factors that enhance consolidation in infants are: consistent sleep and repetition of newly introduced language concepts such as vocabulary in infancy.

Working Memory

- Working Memory involves temporary storage of information and the ability to manipulate it.
- Working Memory aids in encoding of spoken language in infancy and sentence structures in early childhood.
- This subcategory also requires attention skills to manipulate new information based on instruction.

Visual Recognition Memory (VRM)

- Research shows that infants with better immediate and delayed VRM have stronger expressive language skills at 24 months.
- Infants who perform better on VRM tasks link written language to physical objects. This leads to expanding vocabulary and awareness of grammatical rules.
- VRM allows infants to identify faces of familiar people which leads to better social communication in early childhood.

Suggested Activities

Treasure Hunt

- Provide verbal list of adjective based categories.
- Great opportunity for joint attention between child and caregiver.
- Targets working memory by instructing infants to hold information in their mind while they use visual attention to scan their environment.

Nursery Rhymes

- Reciting songs exposes a child to a variety of expressive language areas such as prepositions, adjectives, and verbs.
- Targets receptive language, joint attention, and predictable patterns
- Easily repeatable and doesn't require materials.

List of Rhymes with Lyrics:

Matching Game

- Lay picture cards face-down and prompt a child to flip over cards to find a match.
- Caregivers can use langauge to label and describe pictures.
- Strengthens connections between language and visual stimuli.

Developmental Milestones:

References: