The Relationship Between Motor Development & Language Development Using the ICF Framework

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INTRODUCTION

- Children with physical disabilities often have concomitant delays in language development. This poster explores the impact of motor delays and impairments on the trajectory of language development.
- The International Classification of Functioning, Disability and Health (ICF) model of disability helps illustrate the interconnectedness of not only things **inherent to the child** (strength, cognition, etc) but also the specific **task requirements of the activity and the environmen**t in which the activity is occurring (WHO, 2001).
- Activity and participation restrictions can be caused by:
  - impairments in a person's **body structures or functions**
  - **contextual factors** related to the physical and social environment
- Intervention can therefore target either the individual or the environment (social or physical)

AIMS

- To provide an overview of typical motor development supports language development
- To illustrate how motor delay or impairment can affect language development through clinical examples
- To present theory or research-based interventions to ameliorate the physical challenges and support language development
- To encourage clinicians to consider a child's motor skills when planning intervention for delays in communication.

OBJECT MANIPULATION SKILLS

Typical Motor Skills Impact on Language

- Batting, reaching, grasping, banging, exploring and manipulating objects **help infants learn concepts** that form the foundation of language development. (Bushnell & Boudreau, 1993)
- Object exploration also encourages social interaction. Parents **make the connection between an object and its name or description**. For example, as infants reach out for a rattle, parents might say "You want your rattle!"

Clinical Example

- A young child with Down syndrome with low tone and decreased strength

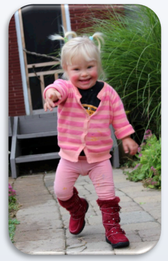
Intervention

- To encourage reaching and batting at toys:
  - lower toys in the activity gym
  - support the body by laying them in a boppy for shoulder support
- To encourage play with toys in sitting:
  - provide postural support by using a boppy, a bumbo seat, or having child between mom's legs, to free up her hands to play with toys. (Lobo & Galloway, 2008)

INDEPENDENT MOBILITY

Typical Motor Skills Impact on Language

- Crawling and walking support language development in a variety of ways.
  - **Increases children's attention to distant people and objects** in their environment and helps them **learn to follow a point** (Campos, 2000)
  - Provides the ability to follow caregivers resulting in **increased bids for social attention** and increased social referencing (Clearfield, 2008)
  - **More language is directed at mobile children**, often in attempt to **regulate their behavio**r, and **mothers direct even more language at walkers than crawlers** (Green, 1980)
  - **Enhances emotional expression** both through an increase in positive exchanges between child and mother as well as a testing of wills (Biringen et al., 1995)



Clinical Example

- Identical twin boys who had twin-to-twin transfusion in utero.
  - Twin A crawls at 9 months and walks at 13 months
  - Twin B doesn't crawl until 12 months or walk until 20 months.
  - Twin B will naturally have less language directed at him (Green, 1980) and have fewer exposures to parental behavior regulation (Campos, 2000) compared to his brother.

Intervention

- PT/OT can provide family with strengthening activities
- Provide him with a walking toy to push around before he can walk independently.
- Raise awareness of natural disparity in amount of language directed to each boy and suggest ways to "correct" this difference within daily routines
  - For example, bring Twin B to the kitchen with her while making lunch and sit him next to an open cupboard full of plastic containers, which could serve the dual purpose of having him in her vicinity so she can talk to him more and creating opportunities for him to "get in trouble" by making a mess.

GESTURES AND POINTING

Typical Motor Skills Impact on Language

- Gestures, such as a child raising his arms to communicate "pick me up!" typically gain a response from the caregiver who will often be narrating the event, helping children to **map the correct words to their gesture**.
- Pointing, which develops around 11-12 months, is a powerful gesture for young children and can serve a variety of communicative functions. The **age of the onset of pointing predicts gesture development and speech comprehension and production at 14 months** (Butterworth & Morrissette, 1996).

Clinical Example

- A toddler who will later be diagnosed with autism is likely to be delayed in learning to imitate common gestures (Dewey, Cantell, & Crawford, 2007) like waving and pointing. This delay may decrease her parents' labeling of objects in his environment and also decrease the opportunities for joint attention to these objects, which may contribute to language delays.

Intervention

- Teach parents to follow the child's eye gaze as they would a point and label and comment on what the child is looking at.
- Provide AAC as a way to encourage language development. This may also have an impact on the child's ability to point to access the device (Whitmore, Romski, and Sevcik, 2014).

CONCLUSIONS

- Motor delays and impairments may impact language development in a number of ways.
- Early intervention teams should consider the role of motor development and motor skills on participation in language-related activities.
- Interventions can support children's language development by:
  - supporting the child's body structures and functions or
  - altering the environment, whether physical or social, to increase opportunities for language learning in the face of a physical disability.

AVENUES FOR FUTURE RESEARCH

- Research the effects of caregiver training on the amount and type of language a child is exposed to prior to the onset of independent mobility
- Case studies and single subject research on the effects of providing power mobility devices on language development
- Prospective study on the effect of providing AAC to infants on the development of pointing and reaching skills

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