Research With Young Children At Risk For Speech/Language Development: Transitions From Spontaneous To Intentional Behaviors

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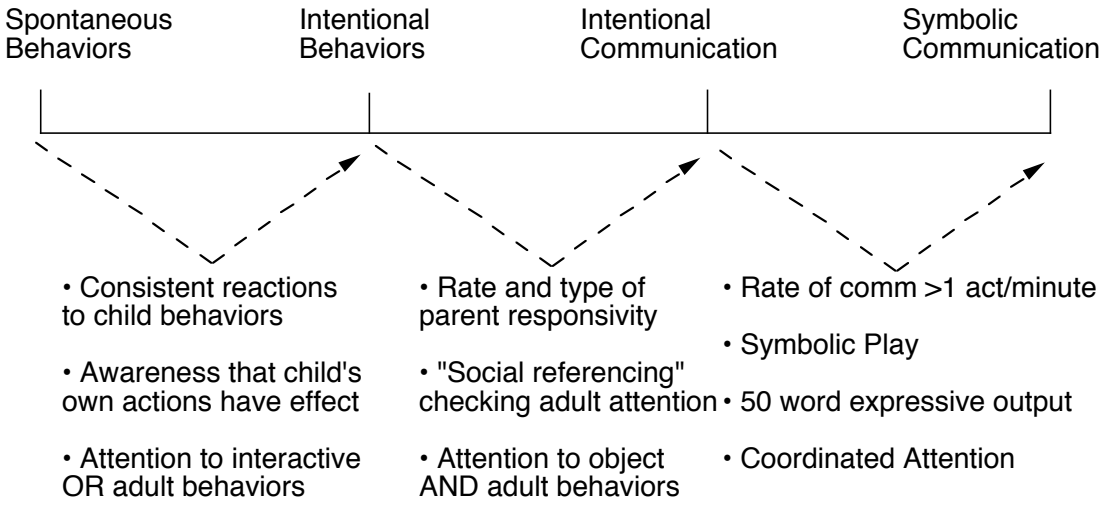
Abstract

This session will present characteristics of language, cognitive, and communicative behavior development observed in an ongoing longitudinal study of young children with physical disabilities who rely on AAC. These data result from assessments & trial AAC interventions with 29 nonspeaking children between 1-3 years. Results indicate that young children relying on AAC are less likely to spontaneously imitate parent behaviors or initiate joint attention communication than would be expected for children at similar language stages. Parents, regardless of background, adapt social & play routines to incorporate their children's unique communicative behaviors. Implications of results for intervention will be discussed.

Factors influencing Transitions between Early Communication Milestones



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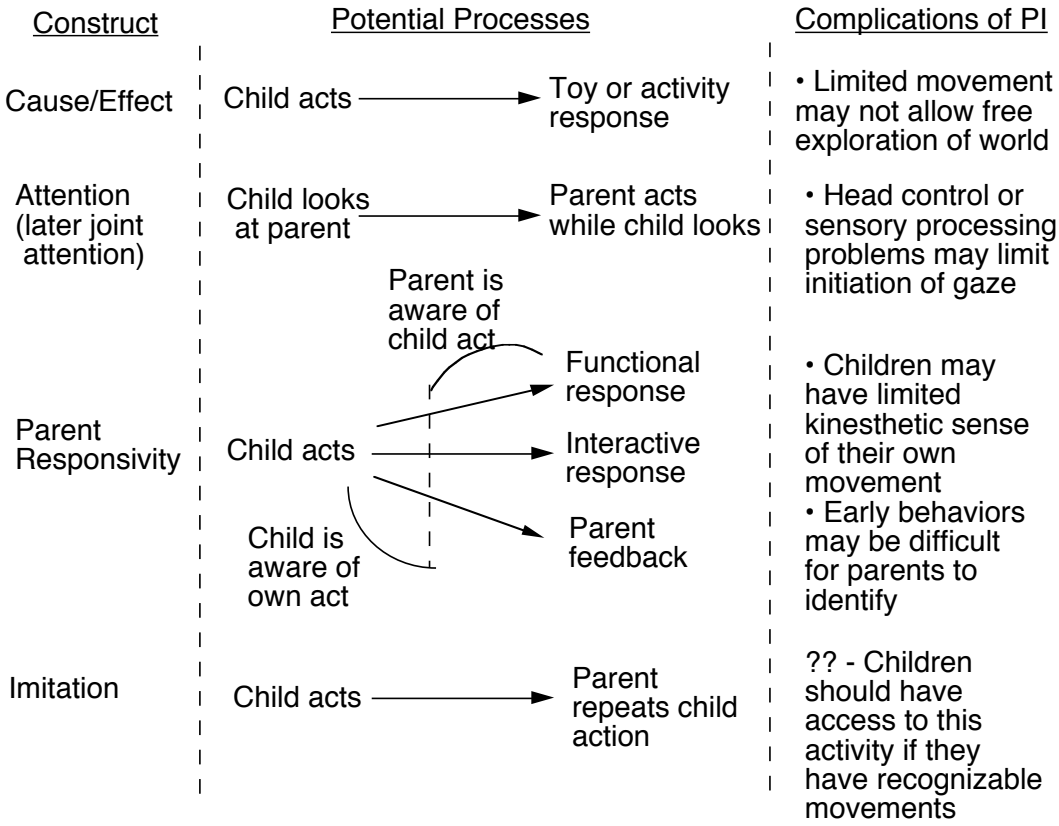
Interactive Processes that Support Intentional Behavior Development and Complications Introduced for Children with Physical Impairments (PI)



Why Is Imitation Important for Language Development in Children with PI?

• Imitation is an early way to practice behaviors and interaction without understanding why those behaviors are important.

• Children who have physical impairments (PI) may have less opportunity to experience using behaviors to learn that they are meaningful, yet will rely on gestures for lifetime communication strategies.

• In typical development, children must focus on vocal behaviors for other reasons than wanting to learn behaviors meaningful in their environment, since they cannot recognize their meaning until they have attended to them (Locke, 1996). Other processes must be active that influence the child to attend to actions that will become meaningful.

• Some other learning processes in early communication such as attention to parent behaviors tend to involve more passive child roles. Children eventually need to also act on behaviors observed and incorporate new behaviors into communicative repertoires.

• Children who already understand intentional and symbolic communcation may have bypassed imitation in early learning, but begin to imitate later because they learned why

• If imitation patterns are indicative of a tendency by children with PI to limit interactive activities without direct functional outcomes, then other language behaviors without clear functional effect may also be limited relative to typically developing children.

Research Questions:

1. Do children with physical impairments demonstrate similar patterns of gestural imitation as typically developing children, given the opportunity to imitate achievable movements?

2. Do children with physical impairments experience similar opportunities and support from caregivers in prompting gestural imitation?

3. Do children with physical impairments demonstrate similarities in later language skills that are conceptually related to imitation?

Subjects

- The data reported here are part of a 5-year longitudinal study of communicative development in children with physical impairments. Children & parents receive 2-4 hour visits in their homes to conduct a variety of measures of cognitive and communicative development over a period of 18 months each (6 visits every 3 mo.).
Children begin participation at 12-24 months (corrected age) and end at 30-42 months

- Ages: Data reported on 30 children, mean corrected age 18.4 mo. (range 12-24 mo.)
Behavior samples and test scores are taken from their first visit only.
Battelle Developmental Inventory Score Means (age equivalence): Overall: 8.5 mo., Receptive Communication: 12.4 mo, Expressive Communication 9.8 mo.

- Children have primary diagnoses of physical impairments and demonstrate characteristics of risk for vocal expressive development (McDonald, 1980)

Disability types: Cerebral Palsy: 10 Inherited Condition or Syndrome: 6
Postnatal Illness/Injury: 8 Developmental Disabilities unknown: 6

- Children may have secondary diagnoses such as cognitive or sensory impairments (with some useable hearing/vision)

Question 1. Do children with physical impairments demonstrate similar patterns of gestural imitation as typically developing children, for achievable movements?

Number of subjects: 30.
Measurement: Uzgiris-Hunt cognitive scales, adapted for children with disabilities (Robinson et al, 1985). Measurements from first experimental visits, mean age 18.4 mos. (12-24 mo. range)

- Eight subtests reflecting cognitive skills that support language development: Causality, Object Permanence, Communication, Means/End, Spatial Relations, Visual Pursuit, Verbal Imitation, Gesture Imitation. Children were scored from 1 to 6 reflecting their Piagetian stage on this measure

- Children who showed emerging skills in a more advanced stage but had not completed the previous stage were ranked halfway between the stages (e.g. 3.5 indicated incomplete skill completion in stages III and IV)

- Scores were converted to difference scores by subtracting each child's subtest scores from their highest subtest score: e.g. if a child's highest score was 4.5, a subtest scoring 3.0 would have a difference score of 1.5.

Analysis: Wilcoxon Signed Rank Test (nonparametric) compared Gestural Imitation difference scores to each of the other seven Uzgiris-Hunt subtests

• On a measure of cognitive development (Uzgiris-Hunt), children with physical impairments scored significantly lower on gestural imitation relative to other skills except vocal imitation.

	UzH Subtest	Z-Value	p value
Gesture imitation vs:	Causality	-3.757	.0002 *
	Object Permanence	-3.844	.0001 *
	Communication	-3.916	< .0001 *
	Means/End	-1.957	.05 *
	Spatial Relations	-3.315	.0009 *
	Visual Pursuit	-2.071	.04 *
* significance at $p \leq .05$	Verbal Imitation	-.869	.38

• Children with physical impairments tend to be less likely to imitate behaviors and gestures than other children at similar developmental stages

Why isn't this just a physical problem? Children who are nonspeaking would be expected to have poorer verbal imitation skills, isn't gesture the same situation?

- The version of the Uzgiris-Hunt used in this study was particularly modified for use with children who have physical and/or sensory impairments

- Gestures modelled for children were taken from their signal inventories of behaviors that they produced spontaneously in play and interaction

- Children were credited for imitation if they attempted to produce an adult behavior, even if they were unsuccessful (e.g. posturing)

- Children imitated behaviors with toys that they didn't imitate "just because" in interaction

- Other Uzgiris-Hunt subtests that require physical skills (e.g. means/end) were still significantly better than gesture imitation skills

Question 2. Do children with physical impairments experience similar opportunities and support from caregivers in prompting gestural imitation?

• Given an otherwise robust language learning system, shifting modalities to a gestural strategy should not delay language learning or associated communicative processes.

- Children learning sign language with deaf parents learn to focus on gestural communicative behaviors with differential parent response to child acts and specific behaviors to direct child's attention to their own movement and its interactive results.

- Hearing parents of deaf children in some cases may be less skilled at helping children focus attention on communication through gestural modes.

• Key qualities of early parent imitation:
- Child produces behaviors that can be imitated by adult (otherwise adult scaffolds entire interaction)
- Parent follows child's lead promptly (contingency)
- Parent imitates child behavior exactly to clearly associate behaviors (salience)
- Parent imitates behavior in similar ways across time (consistency)
- Parent gradually modify behavior to another achievable model
- Expansion tends to follow repetition/imitation of child behavior

Videotape Analysis of Parental Gestural Imitation: Preliminary Results:
• All instances of free play or unstructured interaction between parent and child were from the first experimental visit: average of 9.2 minutes/child.

Observations of Parent Factors in Gestural Imitation:
• Frequent functional responses to children's behavior (e.g. take out of chair when fuss)

• Occasional verbal interpretation of children's behavior ("oh, you're hungry")

• Few instances of parents directly imitating children's exact movements or prompting behaviors with exact child models.

• Behaviors may be contingent, but not salient with an explicit link to child's behavior. For example, parents often prompt children's behaviors with verbal or routine cues without modelling the target communicative behavior for the child.

• Parents usually expand or verbally translate children's movement without first imitating it directly; the child must interpret or transform the parent behavior into their own achievable behavior.

• When children produce conventional gestural signals (e.g. pick up), parents are providing gestural models and feedback similar to those seen in typical development.

Child factors influencing low gestural imitation by parents:
• Low behavior rate by children
• Often produce behaviors that are difficult to imitate by parent (or unconventional)

Question 3. Do children with physical impairments demonstrate similarities in later language skills that are conceptually related to imitation?

Later Language Correlates: Focus on joint attention
• If reduced imitation is part of overall reduction in using communication and language as a learning space, then we should continue to see effects in related language functions that do not have a direct functional outcome for the child, such as showing or directing adult attention to objects (joint attention).

Measure: Communicative and Symbolic Behavior Scales (CSBS) (Wetherby & Prizant, 1993):
- The CSBS provides 9 communicative "temptations" that prompt children to request and/or comment on play activities, such as presenting a bag of toys and helping the child pull each one out

- Children's communication may be gestural and/or vocal, but must be directed towards an adult to be considered a communicative behavior (e.g. by looking or reaching towards the adult)

- Communicative behaviors may represent one of three communicative functions: Behavior regulation, Joint attention, or Social Interaction

- Children's raw scores are converted to scaled scores from 1-5, based on norm derived from typically developing children at similar language stages (scaled scores are presumed equivalent across functions)

Analysis: Wilcoxon Signed Rank Test comparing CSBS scaled scores for Behavior Regulation and Joint Attention

- Not all children could complete the CSBS: 18 children analyzed, one behavior sample for each child (from the first research session)

Results:

• Joint Attention Scaled Scores are significantly lower than Behavior Regulation scores: Z Value: -2.260, p = .02. Therefore, children with severe physical and vocal impairments tended to produce fewer joint attention acts than expected relative to their behavior regulation acts, across all skill levels included in the analysis.

• Scanning the data suggests that children's discrepancy between behavior functions may increase with language proficiency, and that measuring rate of learning across sessions may better reflect difference. Preliminary review also suggests that children monitor parent or adult attention within expectations for their communicative rate (using gaze shifts) but are less likely to act to control a parent's joint attention

Interpretation: Children with physical impairments are also less likely to direct someone else's attention (joint attention behaviors), for reasons similar to those that explain differences in imitation, i.e. that both types of behavior represent communication as its own end as a "just because" behavior

Discussion: Why Might Imitation be Limited in Children with PI?

Working Hypothesis: Spontaneous imitation may have a low cost/benefit ratio for children with physical impairments. It is difficult enough for children to control their physical movements that they may not produce interactive behaviors that are not associated with clear functional or communicative benefits. Imitation may function as "small talk" for children with PI, who may not demonstrate imitation until later in development when they understand the social importance of this behavior.

Parents may not provide similar imitative experiences for gestural imitation as seen in vocal imitation for speaking children. This may result from a combination of parental experience and/or bias in providing vocal and routine behavior cues, greater discomfort at imitating unusual child behaviors relative to vocal behaviors, and limited gesture production by children to initiate imitation.

Implications for Children's Language Development:

• Limited use of motor plans that will become communicative behaviors
• Limited use of interactive or communicative behaviors as a learning space
• Limited use of behaviors within interaction foundations before children recognize their functional impact for communication and play

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