Mealtime Communication and Later Language Skills in Premature Infants

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American Speech-Language-Hearing Association Convention, Chicago:
November 20, 2008
Agenda

Research interest- dissertation study:

• Define terms
• Brief review of literature
• Outline research questions
• Results and Implications
Defining “Premature” Infant

- Premature = <37 weeks gestation
- My research all infants <35 weeks
- VLBW = very low birth weight
  - <1500g (3.5 lbs)
Rates of Prematurity in USA

- 20% increase ’90-08
- Currently 12.5% <37
- 10,000 babies a week
- 1400 a day in USA
- 18% African American
- 8% VLBW <3.5 lbs

- Annual societal economic cost (2005) $26.2 billion
Early Communication Research

• Communication development occurs in the context of social interactions (e.g. Lewis & Freedle, 1973; Sameroff, 1975; Bruner, 1981)

• Feeding interactions represent a frequently occurring context for communication that begins at birth (Sparling & Rogers, 1985; Satter, 2000).

• Second half of the first year of life early vocalizations and communicative behaviors emerge (Davis & MacNeilage, 1995; Oller et al., 1999; Thal and Tobias, 1992, 1994)
Preterm Infant Research

• Behaviorally: little vocalization, less socially interactive when compared to full terms at 6 months during feeding interactions (Mathisen et al., 2000)

• Approx 50% of VLBW infants will go on to exhibit delays or LD by school age, including later speech and language delays (Aram et al., 1991)
Feeding Skills Research

• Preterms found to have significant ongoing feeding difficulties/at risk for continued feeding problems (Hawdon et al., 2000)

• Inconsistencies with regard to oral-motor skill development, fewer readiness behaviors for solids (Mathisen et al., 2000)
My research questions…

• What is the relationship between oral-motor/feeding problems and speech and language development?

• Structures used are same for both

• Might feeding problems and/or breakdowns in communication during mealtimes early on be developmental “red flags” of later communication delays or disorders?
Purpose of Dissertation Study

• To examine the early oral-motor feeding skills and communicative behavioral acts of preterm infants at 6 months adjusted age.

• To document the relationship between these early skills and later speech and language skills at two years of age.
Methods: Participants

• 42 African American premature infants and their caregivers from MOMS study at UNC SON

• Videotape footage at 6 months adjusted age during home visits

• At least 5 minutes of feeding footage

• Less than 35 weeks GA

• Infants all less than 1500 grams at birth and/or mechanically ventilated = “at risk”
Data Coding

Severity Rating Scales-Composite Scores

1. Early Communication “Red Flags”
2. Mealtime Communication “Red Flags”
3. Oral Motor Dysfunction- Bottle Feeding
   OR
   Oral Motor Dyfunction- Spoon Feeding
Predictor Variables

• 3 Composite Scores from “Red Flags” Scales for each infant

• Mealtime Communication

• Overall Early Communication

• Oral-Motor Feeding Skills and Dysfunction

• Higher scores = more possible “red flags” suggestive of later difficulties
Outcome Variables

• Preschool Language Scale-4 (Zimmerman, Steiner, & Pond, 2002)

• Scores at 2 years of age

• Also had available Bayley Scales of Infant Development-II scores (Bayley, 1993)
Results: Caregiver
Global levels of caregiver responsiveness at 6 months adjusted age predicted infant PLS-4 scores at 2 years

• Significant findings for mealtimes/feeding
  \[ t = -2.136 \quad p = .039 \]
  \[ B = -6.044, \text{ St. Error} 2.830, \text{ Beta} -.320 \]

• and non-feeding interactions  \[ t = -2.471 \quad p = .018 \]
  \[ B = -7.215, \text{ St. Error} 2.920, \text{ Beta} -.364 \]
Results: Infants

• Mealtime Communication “Red Flags” Composite Scores were predictive of later PLS-4 scores

• Overall Early Communication “Red Flags” Composite Scores not significantly predictive of PLS-4 scores

• Oral-Motor Feeding “Red Flags” not significantly predictive of PLS-4 scores
Results

Summary of Linear Regression Analysis for Mealtime Communication Predicting PLS-4

*results from this regression indicated that for every increase of one point in the mealtime communication “red flags” composite score, PLS-4 scores decreased by 3.7 points (p=.010)

(B −3.702)

R squared estimate=.155; standard error [SE]= 1.368; p=.010
Results

• Whether or not the infant looked at the caregiver more than once during the feeding was significantly predictive of PLS-4 scores.

• Infant responding to the caregiver more than once during the feeding was significant.
Results

• Mealtime Communication “Red Flags” Composite Scores significant relationship with the infants’ Bayley MDI scores

• regression analyses highly significant (p=.007).

• with each 1 point increase on the Mealtime Communication “Red Flags” Composite Score at 6 months adjusted age resulting in a 5.279 points decrease on the Bayley MDI subscale at 2 years.
Results

• Overall Early Communication not significant
• Descriptive information with regard to vocal and early gesture development
• 50% of infants used gestures
• 41% engaged in canonical babbling
• Some appear to be on expected trajectory
• Low overall PLS-4 scores at 2 years
Discussion

• Low PLS-4 scores in this group n=42 (mean score 76.64, -1.5 SD below test mean)

• MOMS study sample n=124 (77.6)

• Evidence that for this sample of African American premature infants there is a risk of language delays
Clinical Implications

• Mealtime appears to be a rich context in which to observe communicative interactions between formerly premature infants and their caregivers.

• Need for practical instrument that codes mother and infant interactions to record infant communicative behaviors and oral-motor feeding skills.
Implications

• Current study documents continued feeding problems in some formerly premature infants

• Mechanisms by which feeding problems develop needs to be explored in future research

• Examining communication in context of mealtime interactions may be beneficial
Acknowledgements

• Diane Holditch-Davis (PI) of original MOMS study, (NINR, NIH R01 NR05263)

• Dissertation Committee Members: Dr.’s Betsy Crais, Linda Watson, Ruth Humphry, Lee McLean, and Suzanne Thoyre

• **Funding:** Royster Society of Fellows at The University of North Carolina Chapel Hill: Paul Hardin Dissertation Completion Award

• CDC Public Health Dissertation Grant
  (R36 DP000349)