# LANGUAGE DEVELOPMENT IN YOUNG CHILDREN AT-RISK FOR DELAY USING THE BAYLEY SCALES FOR INFANT DEVELOPMENT

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## Introduction

The Bayley Scales of Infant and Toddler Development-Third Edition (Bayley-III) is a test that has been widely used for the early identification and quantification of development for children who are at risk for developmental delays. Early identification of developmental delay is important to determine eligibility for early intervention services, given research has shown that early intervention in the first three years of life lends to better developmental outcomes later in childhood. Although the Bayley-III is one of the primary developmental tests used in the US, prior research has cited concern that the test underestimates developmental delay and is not as sensitive to subtle deficits. As such, this preliminary study aimed to examine whether the Bayley-III test would be sensitive to subtle changes in language across different age cohorts.

## Objectives

- Complete developmental evaluations for children who are at risk for developmental delays given complications in neonatal period
- Compare motor and language scores across different age cohorts – hypothesized language scores would be lower for older age cohort

## Materials and Methods

This preliminary study is a cross sectional study examining language trends across ages. Patients were infants presenting to the Johns Hopkins All Children's Hospital (JHACH) Neonatal Follow-Up Program for developmental assessment. The program follows infants felt to be at increased risk for developmental delay given complications in the neonatal period including prematurity, low birth weight, congenital heart defects, ischemic hypoxic encephalopathy, and neonatal abstinence syndrome. The program offers developmental monitoring in the form of yearly assessments from 1 -5 years of age as standard of care. Ages are adjusted for prematurity. The sample includes patients presenting for their 1 and 2 year developmental monitoring visits. The Bayley Scales of Infant and Toddler Development-Third Edition (Bayley-III) was used to assess cognitive, language and motor development at 1 and 2 years of age.

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## Results

| | Younger Cohort (8-15 Months of Age; N=348) | Older Cohort (16-31 Months of Age; N=212) |
|---|---|---|
| **Gender:** | | |
| **Males** | 183 | 109 |
| **Females** | 165 | 103 |
| **Mean Adjusted Age at Evaluation** | 10 months (*n=346*) | 20 months |
| **Mean Gestational Age** | 29 weeks (*n=347*) | 28 weeks (*n=210*) |
| **Mean Birth Weight** | 1326 grams (*n=343*) | 1237 grams (*n=207*) |
| **Bayley-III Composite Scores:** | | |
| **Language** | 101.91 | 88.88 |
| **Motor** | 97.48 | 94.23 |

**Table 1 - Sample Descriptive Information**
Table containing descriptive statistics and gender distribution of sample
Note: Sample sizes for missing data are indicated in italics

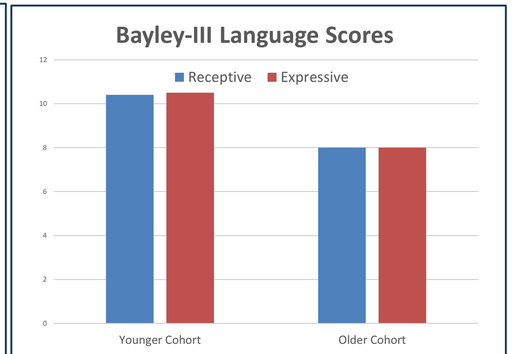


**Figure 1 – Score Comparisons**
Image depicts language scores across age cohorts

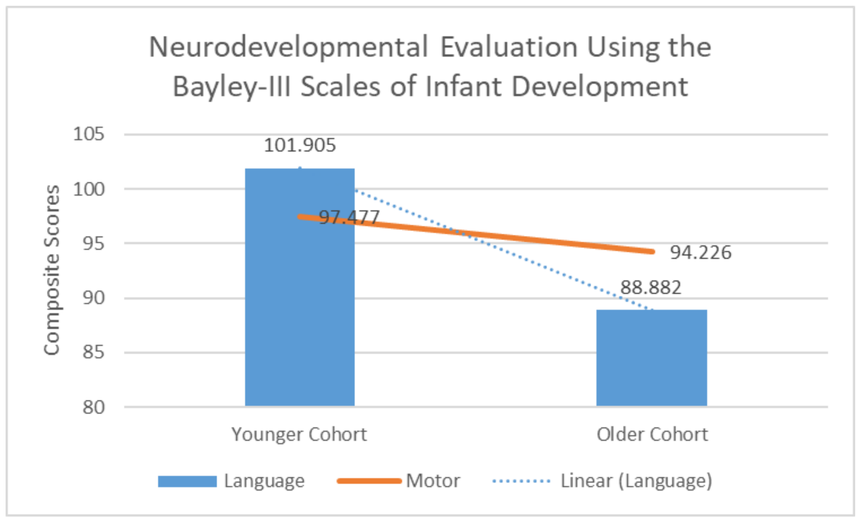


**Figure 2 – Score Comparisons**
Image depicts score comparisons of developmental evaluation scores across age cohorts

## Preliminary Findings

- No significant difference in gender within cohorts
- No significant difference in birth weight across cohorts
- No significant difference in gestational age across cohorts
- Trend of lower language scores across cohorts
  - Older cohort scoring >10 points lower on average
  - Findings suggest slower language development in study sample compared to normative peers of the same age
- No significant difference in motor scores across cohorts

## Future Directions

This study included preliminary analyses of score trends from developmental assessment using a mixed convenience sample of patients followed in the Neonatal Follow-Up Program. Results suggest downward language score trend with increased age. The study is limited by convenience sample of program patients who are administered one measure for developmental assessment as standard of care. The study is also limited by the cross sectional design. Future efforts aim to examine longitudinal developmental data of patients followed in the program to determine if the observed downward language score trend persists at older ages. Future research also aims to examine patterns of developmental score trends by patient cohort (i.e., extreme prematurity compared to neonatal abstinence syndrome) to better understand language development in these at-risk populations.

## References

1. Leonard, CH, Piecuch, RE, et al. Use of the Bayley Infant Neurodevelopmental Screener with low birth weight infants. *Journal of Pediatric Psychology*. 2001; 26(1):33-40.

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