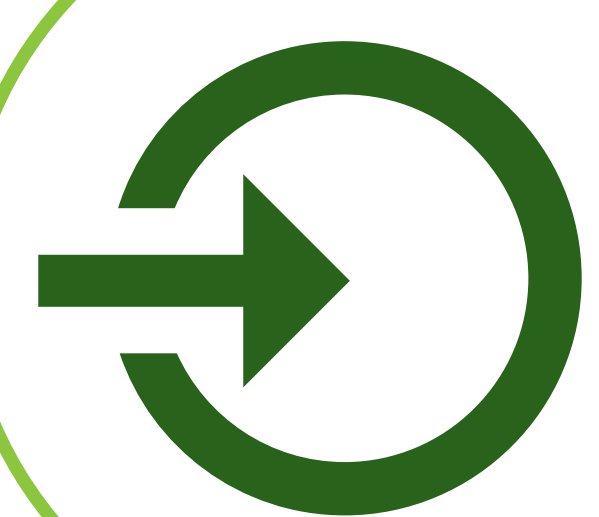




Project EF: Executive Function (EF) in Infants and Toddlers Born Low Birth Weight and Preterm

Patricia M. Blasco, Ph.D. (blascop@wou.edu), Sybille Guy, Ph.D. (guys@wou.edu) & Serra Acar, Ph.D. (acars@wou.edu)
CRIEI 2016: San Diego, CA



Introduction

- Project EF: Executive Function in Infants and Toddlers Born Low Birth Weight (LBW) and Preterm examines components of EF in the structure of traditional infant and toddler assessments. The purpose of the study is to extrapolate early indicators of executive functioning in three subgroups of children ages six months to three years:
 - children born LBW and preterm at low risk,
 - children born LBW and preterm at high risk, and
 - children born at full term.
- The primary goal in Years 1 and 2 is to assess a sample of 100 children born LBW and preterm and 50 children who were full term by administering standardized measures involving both caregiver report and individual assessment.
- In Year 3, the children will be assessed on these measures as well as tests of executive function. Our hypothesis is that we will find early indicators of EF in these measures and that there is a difference between LBW and children developing typically.



Methods

Participants

- Children who were born LBW and preterm who are being followed in an NICU Follow-Up Clinic at the Oregon Health & Science University. In addition, children born LBW are recruited from other NICU's in Oregon. Children who are full term are recruited in the local community and assessed at The Research Institute (TRI) at Western Oregon University and OHSU.

Measures

- Children will be tested 3 times, once each year. The Bayley Scales of Infant and Toddler Development (Bayley-III) and the Dimensions of Mastery Questionnaire (DMQ 18) will be administered in all three years. The Child Behavior Checklist will be added for year 2 and 3. The Behavior Rating Inventory of Executive Function, Preschool version (BRIEF-P), and E-Touch will be used in Year 3 of the study.
- Preliminary results are for Year 1.

Sample Demographics

	N	%
Typical	20	38.5
LBW	32	61.5
Low Risk (bw = 1500 g+)	23	44.2
High Risk (bw <1500g)	9	17.3
	Typical (N=20)	LBW (N=32)
Gender	%	%
Male	50.0	37.5
Female	50.0	62.5
Race/Ethnicity		
American Indian/Alaska Native	--	3.2
Asian	15.0	6.5
Black/African American	--	6.5
Hispanic/Latino	15.0	22.6
White, non-Hispanic	70.0	48.4
Other	--	12.9



Results

DMQ Scales - Average Scores

	Typical (N=19)	LBW (N=32)
Object Oriented Persistence	3.38	3.32
Social Persistence with Adults	2.92	2.56
Social Persistence with Children	2.65	2.34
Gross Motor Persistence	3.86	3.49
Mastery Pleasure	4.11	3.74
Negative Reaction to Failure	2.62	2.44
<i>General Competence</i>	<i>3.54</i>	<i>2.39</i>

Typical and LBW children did not differ significantly on seven DMQ scales with one exception:

- Parents of Typical children rated them significantly higher on General Competence ($t(48) = 3.18, p < .001$) than parents of LBW children. This difference is still statistically significant if we adjust for multiple tests.

Bayley-III Scales – Average Scores

	Typical (N=20)	LBW (N=30)
Cognitive Scaled	10.10	10.06
Cognitive Composite	100.50	100.31
Receptive Scaled	8.55	8.44
Expressive Scaled	9.55	8.19
Language Composite	94.65	90.25
Fine Motor Scaled	11.15	10.38
Gross Motor Scaled	11.20	9.47
Motor Composite	106.90	99.22

Typical children scored statistically significantly higher on two scales:

- Expressive Scaled ($t(50) = 3.01, p = .004$)
- This difference is still statistically significant if we adjust for multiple tests.
- Language Composite ($t(50) = 2.56, p = .04$)
- This difference is statistically not significant if we adjust for multiple tests.

Bayley-III and EF Scales – Average Scores

	Typical (N=20)	LBW (N=32)
Attention	.88	.81
Working Memory	.33	.30
Inhibit	.39	.41
Plan/Organize	.59	.56

Typical children show a statistically significant higher average on one item:

- Attention ($t(50) = 2.81, p = .007$).
- This difference is still statistically significant if we adjust for multiple tests.



Conclusions

- These preliminary results show that general competence on the DMQ 18 was rated significantly higher for children who are typically developing. There was also a significant difference on the expressive language subscale on the Bayley-III and on the attention component that was extrapolated from the Bayley-III.
- Early findings indicate that components of EF are discernable in traditional infant and toddler measures and our hypothesis may prove to be correct at age 3. These findings may help identify an early assessment procedure for examining a child's cognitive processes, motivational aspects, and regulatory approaches to learning.