

# **Early Functional Outcomes of Low and Very Low Birth Weight Babies**

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# Thank You!

- Dr. Marsha Brauen, Westat
- Philip Fletcher, Westat
- Dr. Alexa Posny
- Dr. Lou Danielson, OSEP
- Dr. Rosalind King, NICHD
- Conference Organizers
- All of You for Listening

Disclosure Slide

**Opinions expressed are  
those of the speakers  
and not the United States  
Department of Education**

# Background

- The association of low birth weight at childbirth with poorer outcomes in childhood is well documented.
- ECLS-B offers a nationally representative study to enhance understanding at the *population level* of this association.
- *ECLS-B* uses both actual birth records for birth weights and the Bayley Short Form Research Editions.

# Our Purposes Today

- Report findings on the association of low birth weight with results for proficiency probabilities of the components of the BSF-R mental and motor scales at 9 months and 2 years
- Examine association considering gender, race/ethnicity, poverty, and **maternal education**
- Examine properties of BSF-R

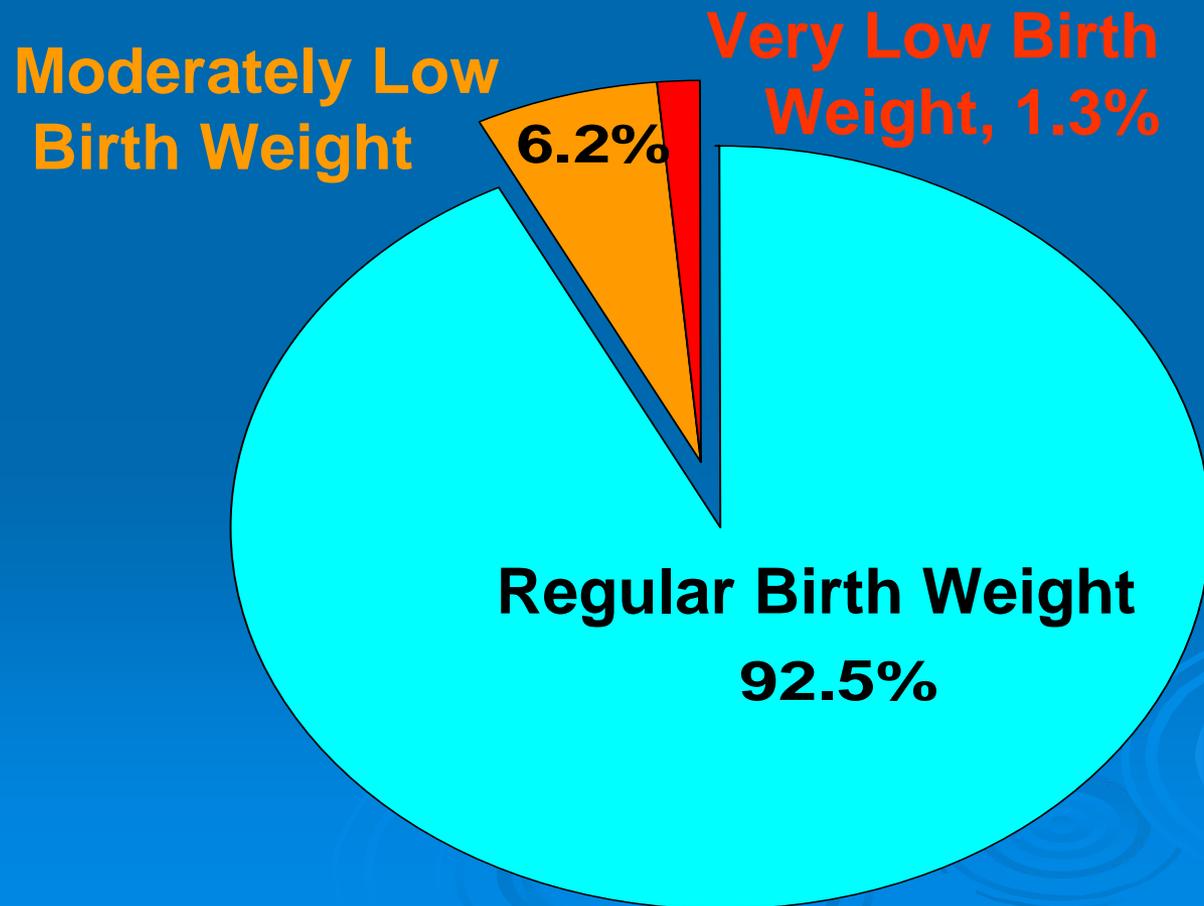
# Assessments in ECLS-B

- **Bayley Short Form-Research Edition, developed for use in ECLS-B (BSF-R)**
- Shortened form of the Bayley Scales of Infant Development – Second Edition
- Standardized assessment of mental and motor developmental status for children up to 42 months of age
- Measure – Proficiency Probabilities
- Length = Approximately 25 minutes
- Hours of Interviewer Training = 14.5

# Percentage Accuracy of Assessors for Scoring Child Responses and for Administration of the BSF-R at 9 Months and 2 Years, Compared to ECLS-B Requirements

Area of Accuracy	Certification Requirement	9-Month Video		2-Year Review
		Mental	Motor	
Scoring	90	97	93	94.5
Administration	85	93	96	95.5

# Percentage Distribution of Birth Weight, Children Born in 2001, United States



# Multivariate Analyses

- Proficiency probabilities can be seen as representing a series of developmental milestones
  - When will a child attain a given developmental milestone?
- Probability of attaining a given developmental milestone plotted in relation to age

# Multivariate Analyses (cont.)

- Can be used to determine the average age threshold when a given developmental milestone is attained
- Can make comparisons between groups
  - Developmental delay expressed as a difference between the average age thresholds in each group

# Multivariate Analyses (cont.)

- Multivariate multilevel model used to estimate main effects:
  - Poverty
  - Gender
  - Race/ethnicity
  - Mother's education
  - Birth weight
- Results represent independent impact of each social condition controlling for other social conditions

# Multivariate Analyses (cont.)

## Mother's Education: Mental Scale main effect results

	Age Threshold for LTHS	Advantage for HSDE	Advantage for SCTV	Advantage for BDG
B: Explores Purposefully	3.0	0.15	0.57	0.08
C: Jabbers Expressively	10.8	0.05	0.17	0.13
D: Early Problem Solving	14.8	0.16	0.27	0.47
E: Names Object	16.4	0.22	0.34	0.59
F: Receptive Vocabulary	19.8	0.27	0.43	0.93
G: Expressive Vocabulary	22.7	0.34	0.46	1.08
H: Listening/Comprehension	25.4	0.37	0.47	1.12
I: Matching/Discrimination	25.8	0.41	0.52	1.25

# Multivariate Analyses (cont.)

## Mother's Education: Motor Scale main effect results

	Threshold for LTHS	Advantage for HSDE	Delay/ Advantage for SCTV	Delay/ Advantage for BDG
B: Sitting	2.6	0.03	-0.11	-0.98
C: Pre-Walking	6.2	0.08	-0.10	-0.92
D: Stands Alone	11.9	0.10	-0.02	-0.40
E: Skillful Walking	16.3	0.16	0.08	-0.03
F: Balance	18.8	0.18	0.12	0.14
G: Fine Motor Control	23.4	0.22	0.18	0.47
H: Uses Stairs	24.4	0.25	0.20	0.42
I: Alternating Balance	26.8	0.24	0.24	0.70

# Multivariate Analyses (cont.)

## Birth Weight: Mental Scale main effect results

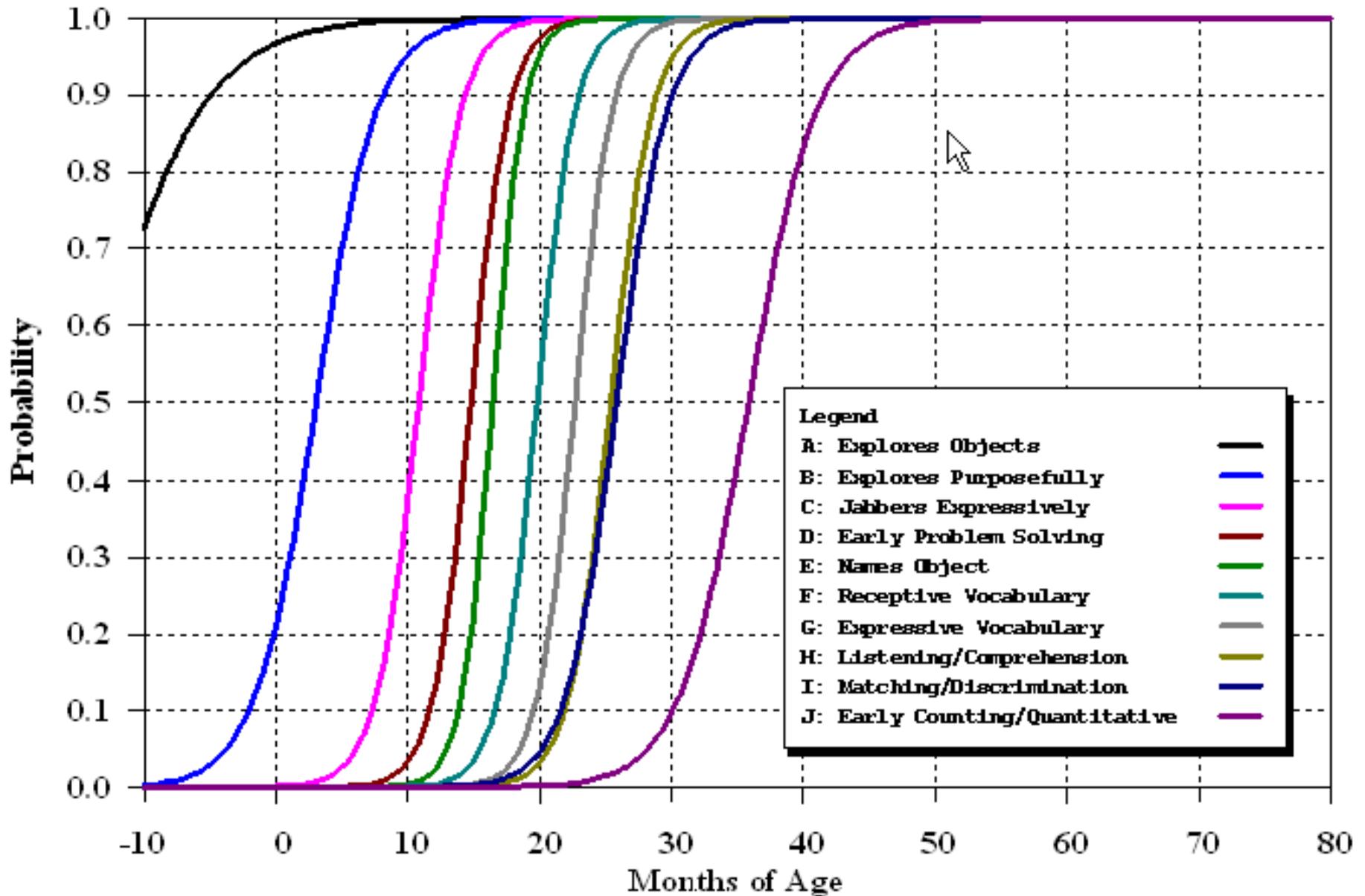
	Age Threshold for NBW	Delay for MLBW	Delay for VLBW
B: Explores Purposefully	3.0	-3.13	-6.86
C: Jabbers Expressively	10.8	-1.72	-3.27
D: Early Problem Solving	14.8	-2.26	-3.32
E: Names Object	16.4	-2.22	-3.10
F: Receptive Vocabulary	19.8	-2.52	-3.01
G: Expressive Vocabulary	22.7	-2.45	-2.73
H: Listening/Comprehension	25.4	-2.48	-3.00
I: Matching/Discrimination	25.8	-2.08	-2.57

# Multivariate Analyses (cont.)

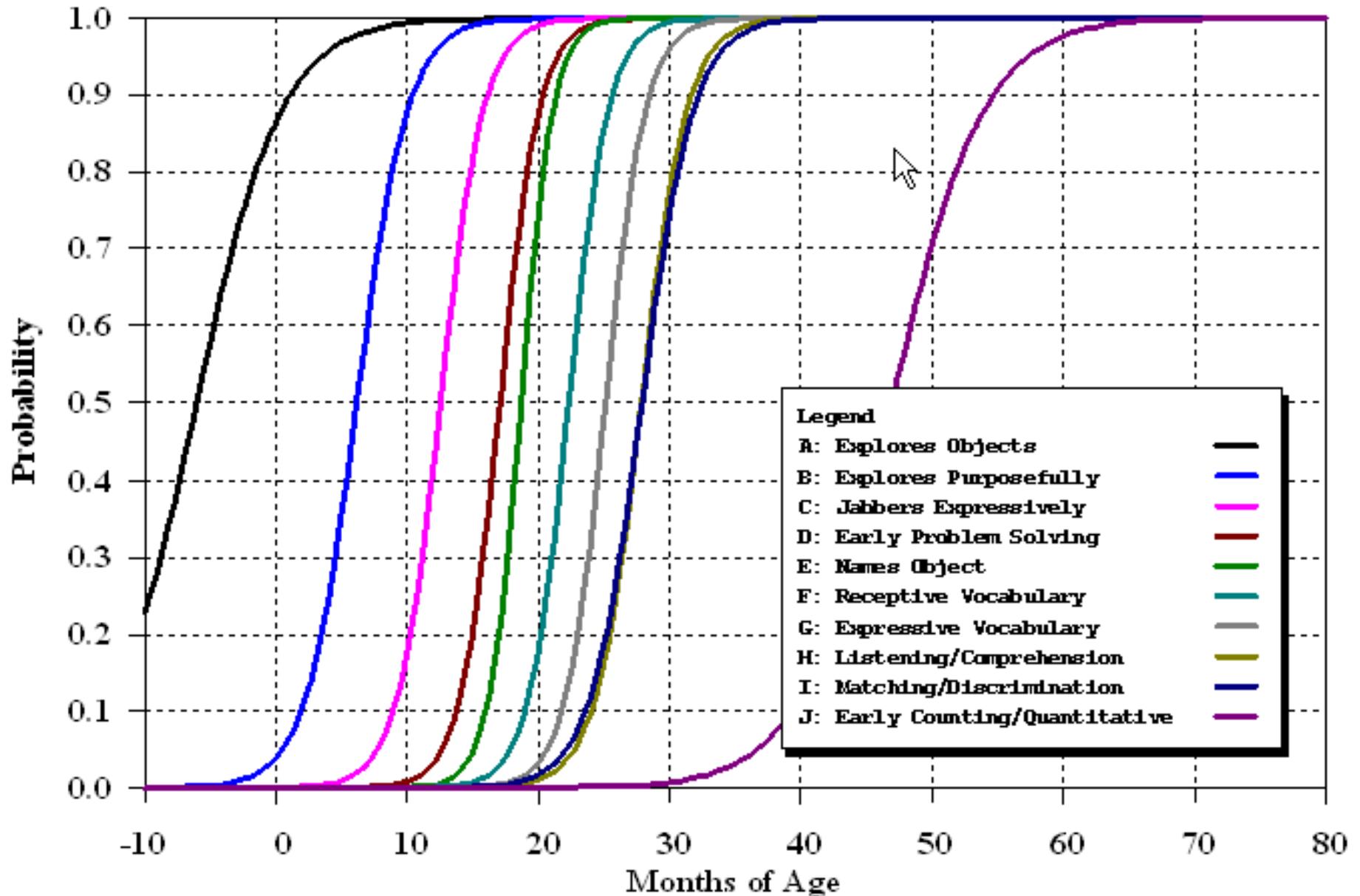
## Birth Weight: Motor Scale main effect results

	Age Threshold for NBW	Delay for MLBW	Delay for VLBW
B: Sitting	2.6	-2.43	-5.70
C: Pre-Walking	6.2	-2.82	-5.78
D: Stands Alone	11.9	-2.18	-4.63
E: Skillful Walking	16.3	-2.17	-4.12
F: Balance	18.8	-2.06	-3.64
G: Fine Motor Control	23.4	-1.82	-3.12
H: Uses Stairs	24.4	-1.28	-1.98
I: Alternating Balance	26.8	-1.59	-2.37

# Normal Birth Weight (Mental)



# Moderately Low Birth Weight (Mental)





# Multivariate Analyses (cont.)

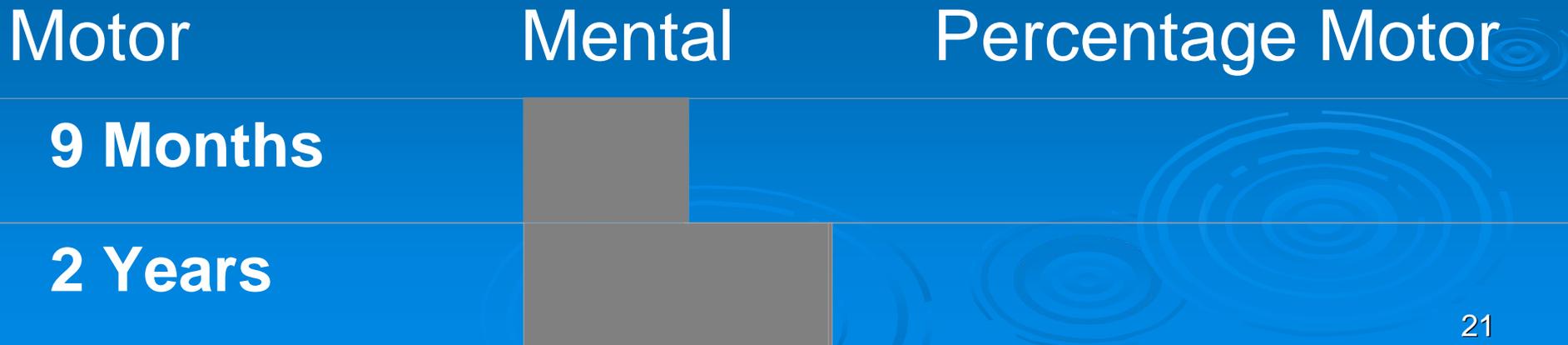
	Moderately Low Birth Weight		Very Low Birth Weight	
	Controlled	Not Controlled	Controlled	Not Controlled
C. Jabbers Expressively	-1.72	-1.24	-3.72	-3.32
D. Early Problem Solving	-2.26	-1.29	-3.32	-3.44
E. Names Objects	-2.22	-1.26	-3.10	-3.23
F. Receptive Vocabulary	-2.52	-1.26	-3.01	-3.14
G. Expressive Vocabulary	-2.45	-1.04	-2.73	-2.91
H. Listening/Comprehension	-2.48	-0.99	-3.00	-3.19
I. Matching/Discrimination	-2.08	-0.89	-2.57	-2.69

# Multivariate Analyses (cont.)

## Summary:

1. Low and very low birth weight associations with outcomes dwarf any other social effect
2. Delays attributed to low birth weight decrease between 9 and 24 months as these children play catch up with children of normal birth weight
3. Broad evidence of increasing inequality in outcomes as children mature between 9 and 24 months (e.g., mother's education)

# Illustrative Schematic Hypothesizing Direction of the Percentage of Mental and Motor Components Comprising the BSF-R Mental and Motor Scales at 9 Months and 2 Years



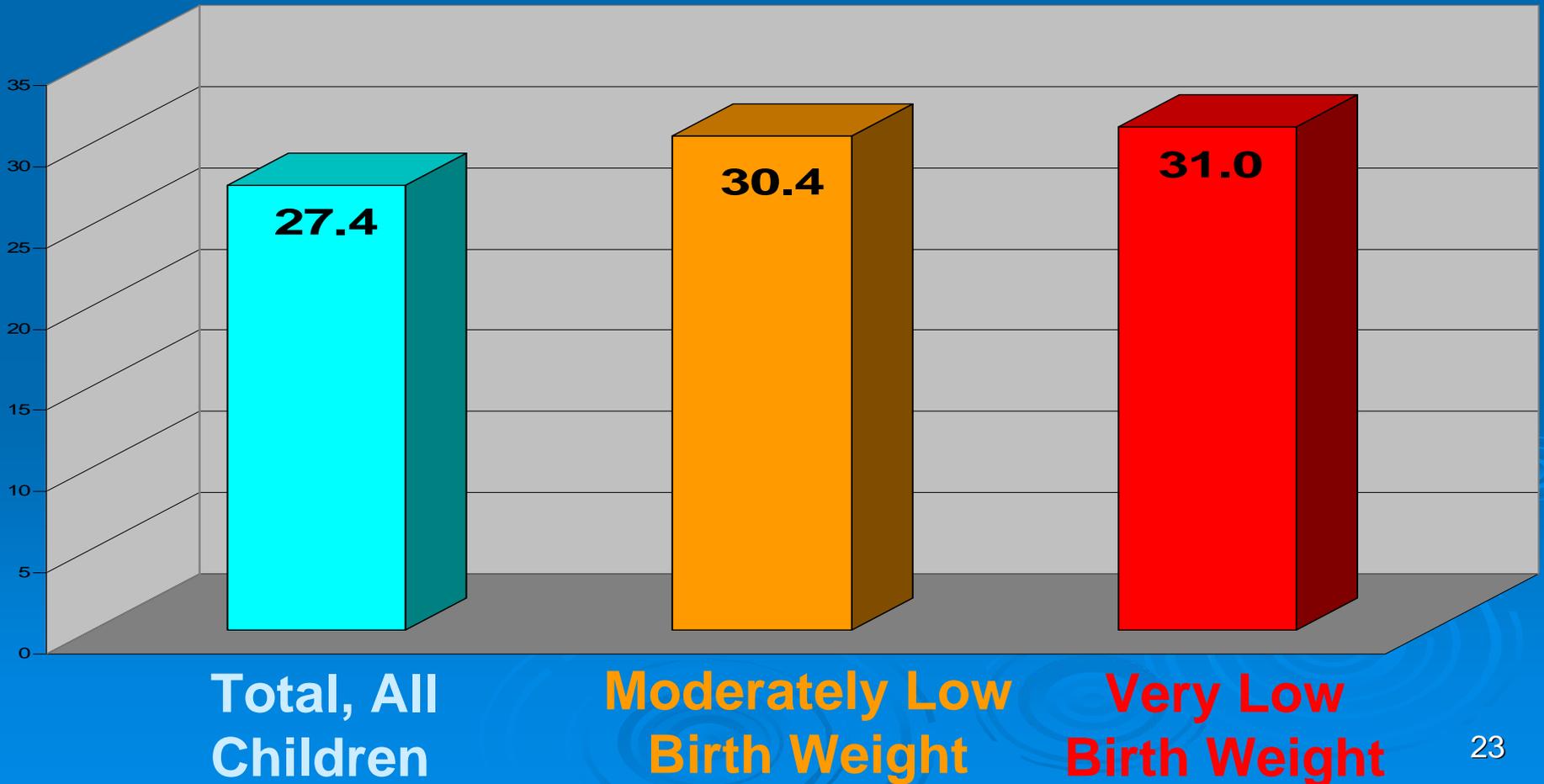
# Illustrative Schematic Hypothesizing the Association of the BSF-R Mental and Motor Scales with Socio-economic Variables

## Association

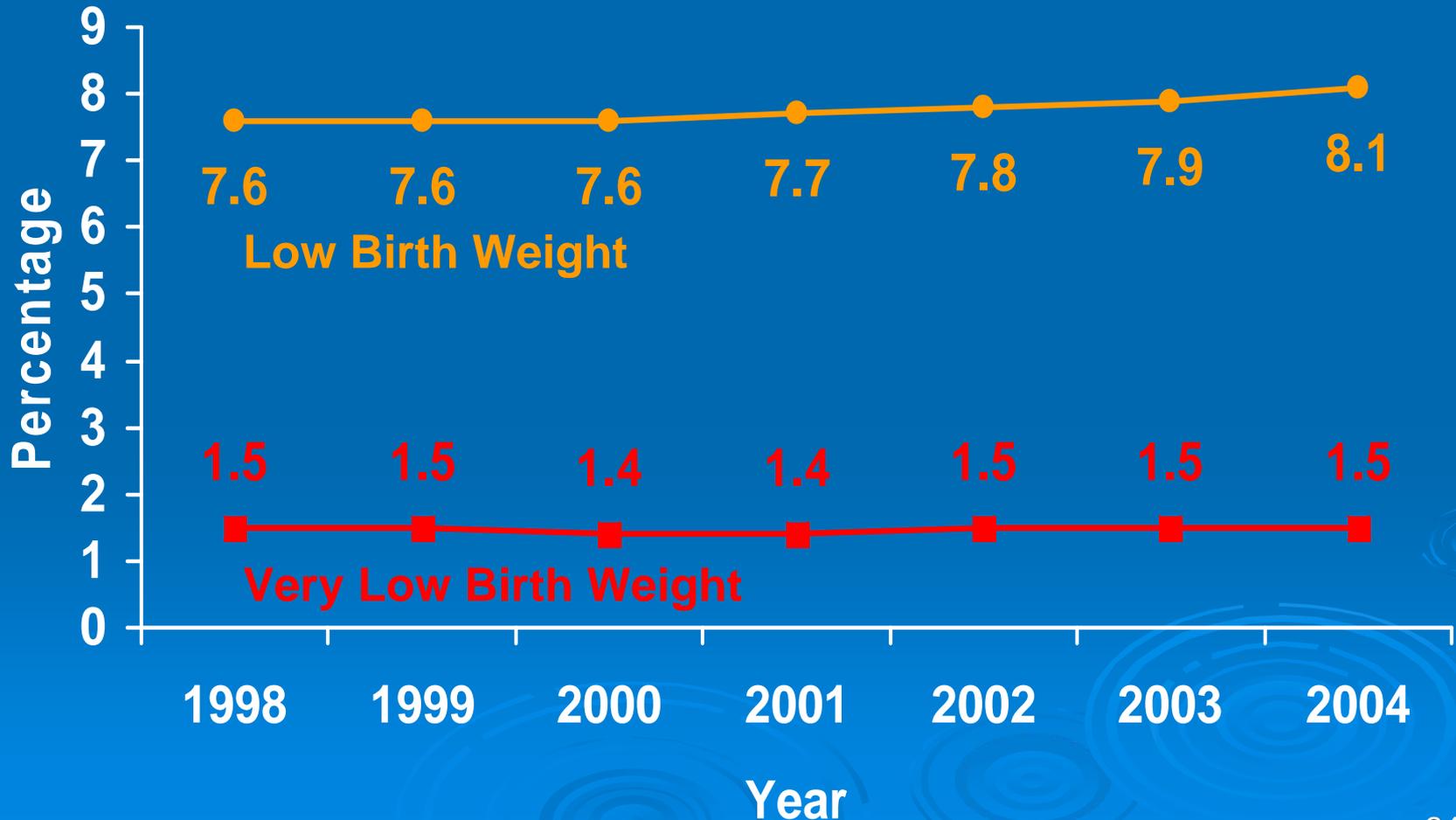
**Motor**

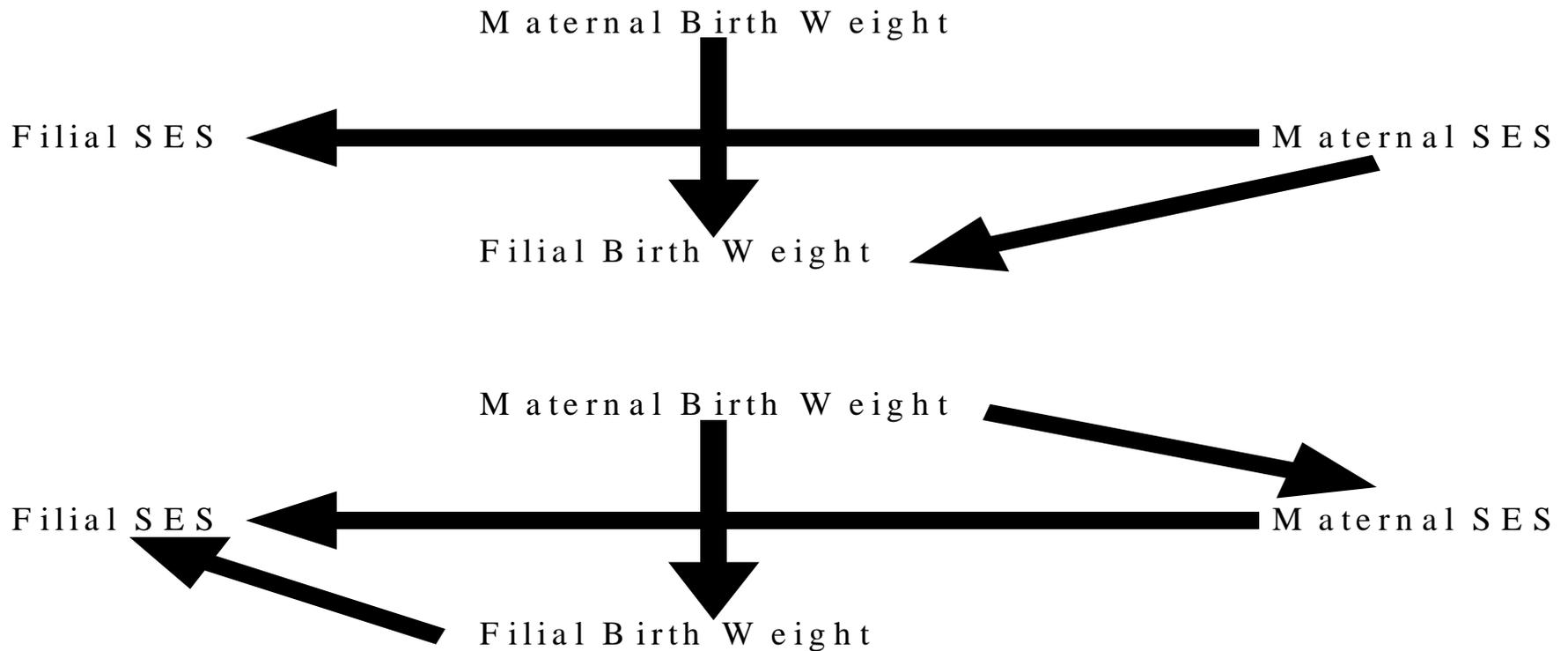
**Mental**

# Percentage of Children Born in 2001 with Mother Not Completed High School by Birth Weight



# Percentage of Children Born with **Low** and **Very Low** Birth Weight, United States, 1998 to 2004





Illustrative Schematic Hypothesizing Direction of Infant Health and Socioeconomic Variables from Dalton Conley (2006)

# Thoughts

- Affects of social variables at 9 months and perhaps later may be understated due to original association at birth and nature of BSF-R.
- Controlled relation of moderately low birth weight and results may be of critical importance, because this population is growing.
- Mother's education, birth weight and outcomes may constitute part of a cycle.

*THE END!*

