

# Developmental Trajectories in Infants with Fragile X Syndrome: Comparing FXS, Autism Siblings, and Typical Controls

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# Overview

- Early Identification of autism and FXS
- Current Study
- Future Directions



# Early Development in FXS

- First sign – late attainment of developmental milestones
  - > Noticeable after 12 months of age
  - > Difficult to differentiate
- Cognitive deficits in moderate to severe range by middle childhood
  - > Stronger verbal than visual-spatial abilities
  - > Mediated by FMRP
  - > Atypical visual attention
- Suboptimal growth vs. true decline?

# Early Development in ASD

- ◎ Autism Siblings
  - > Higher risk of developing autism, compare later outcomes
- ◎ Those who later meet for ASD can be differentiated by:
  - > Atypical social behaviors
  - > Prolonged latency to disengage visual attention
  - > Lower on receptive and expressive language by 12 months of age

# Why is Early Development Important?

12 months- first concern

**FXS**

36 months diagnosis of FXS



20 months diagnosis of DD

Before 2 y o  
(**emerging markers/signs**)

**ASD**

School entry



2 y o (available instruments for diagnosis)

5.7 y o (**actual diagnosis**)

# Current Study

- Do infants with FXS differ in their development compared to ASIBs, other developmental delays, and typical controls?
- At what age are delays evident for each group?

# Methods

Participants were all males

Recruited through studies on early development in FXS (Bailey; Roberts)

and

National Database for Autism Research (NDAR)

Group	N	M age	Min age	Max age
Typical	122	14	5	24
FXS	90	14	7	25
ASIB	22	13	7	24
DD	133	18	3	24

# Methods

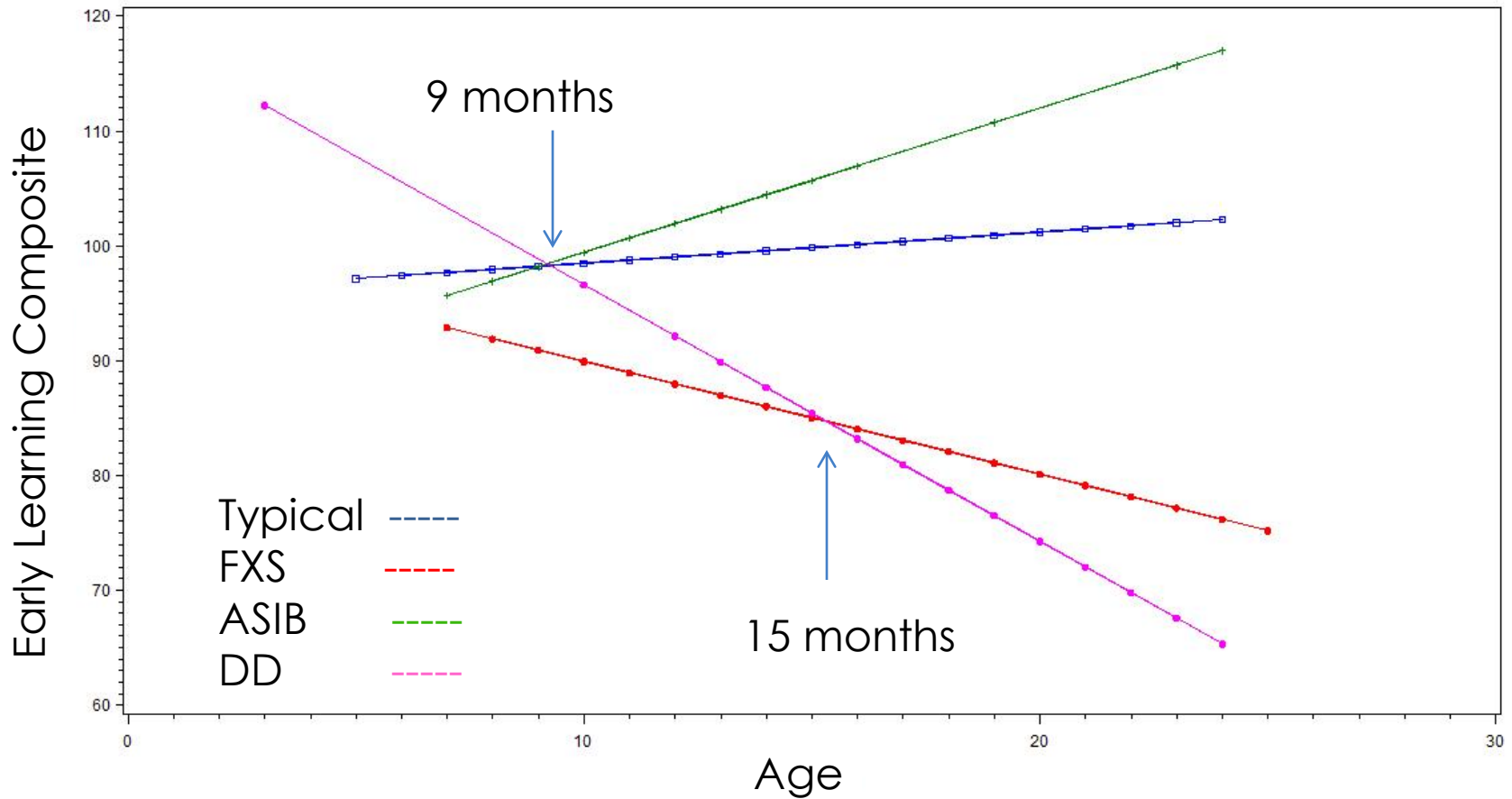
- Mullen Scales of Early Learning (MSEL)
  - > Measure of overall development including:
    - **Visual Reception**
      - Matching items, finding pictures
    - **Fine Motor Skills**
      - Drawing, cutting
    - **Receptive Language**
      - Understanding of language
    - **Expressive Language**
      - Use of language
- Cross-Sectional analysis
  - > Basic regression, no predictors included in model
- Ages 3-25 months



# Results Overview

- ◎ **Early Learning Composite**
  - **Age effect for FXS and DD**
    - **ASIB approaches significance**
- ◎ Expressive Language
- ◎ Receptive Language
- ◎ Fine Motor
- ◎ Visual Reception

# Early Learning Composite

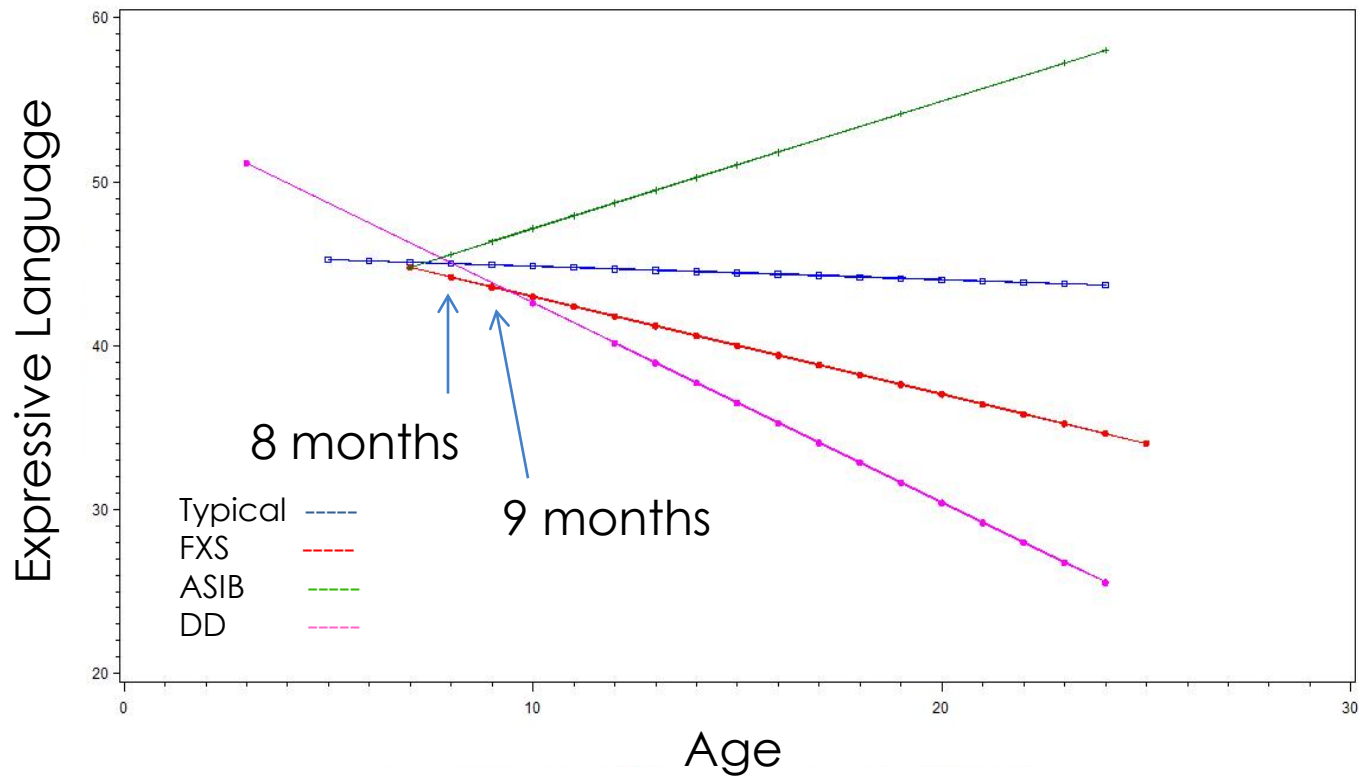


$F(3, 357) = 10.41, p = <.0001$

# Results Overview

- Early Learning Composite
- **Expressive Language**
  - > **Age effect for FXS and DD**
- Receptive Language
- Fine Motor
- Visual Reception

# Expressive Language

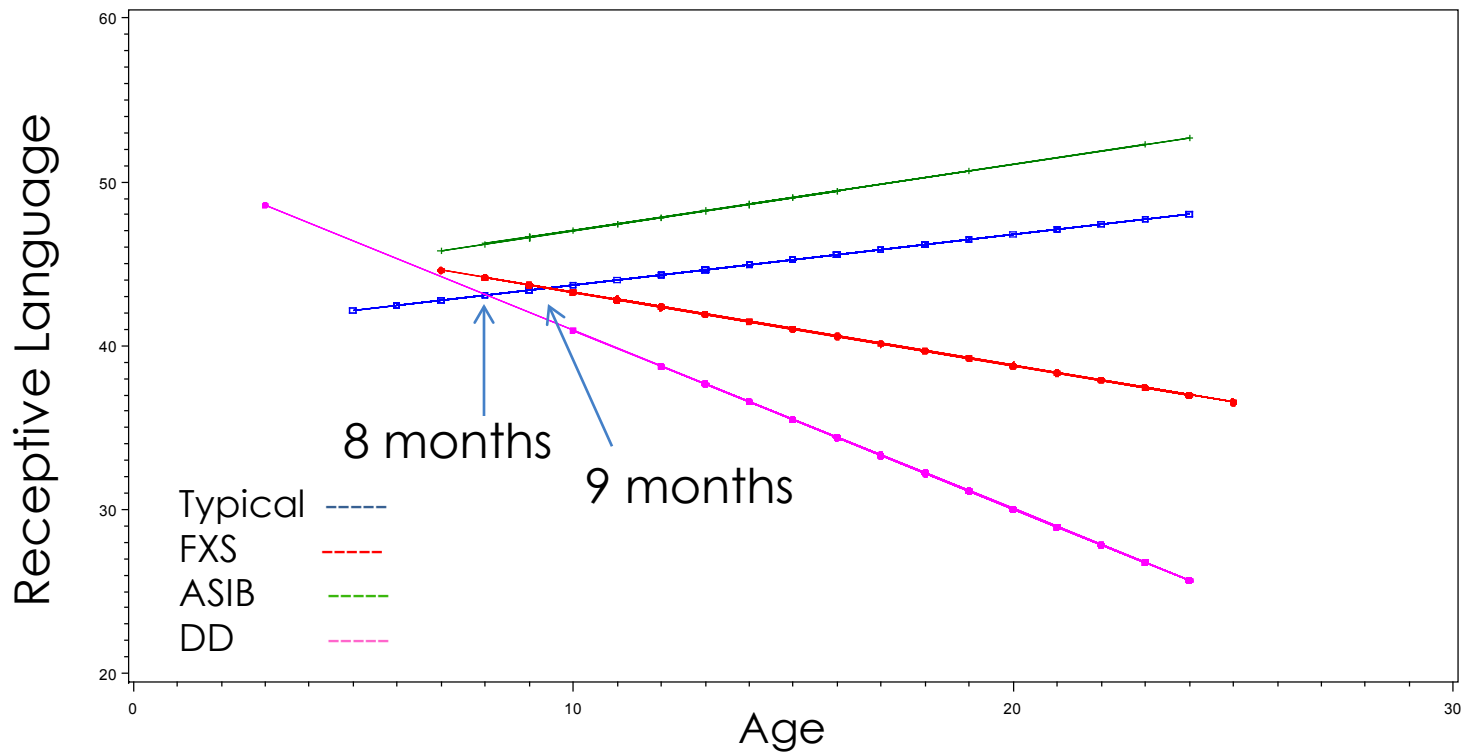


$F(3, 359) = 6.01, p < .0001$

# Results Overview

- Early Learning Composite
- Expressive Language
- **Receptive Language**
  - > **Age effect for DD only**
- Fine Motor
- Visual Reception

# Receptive Language

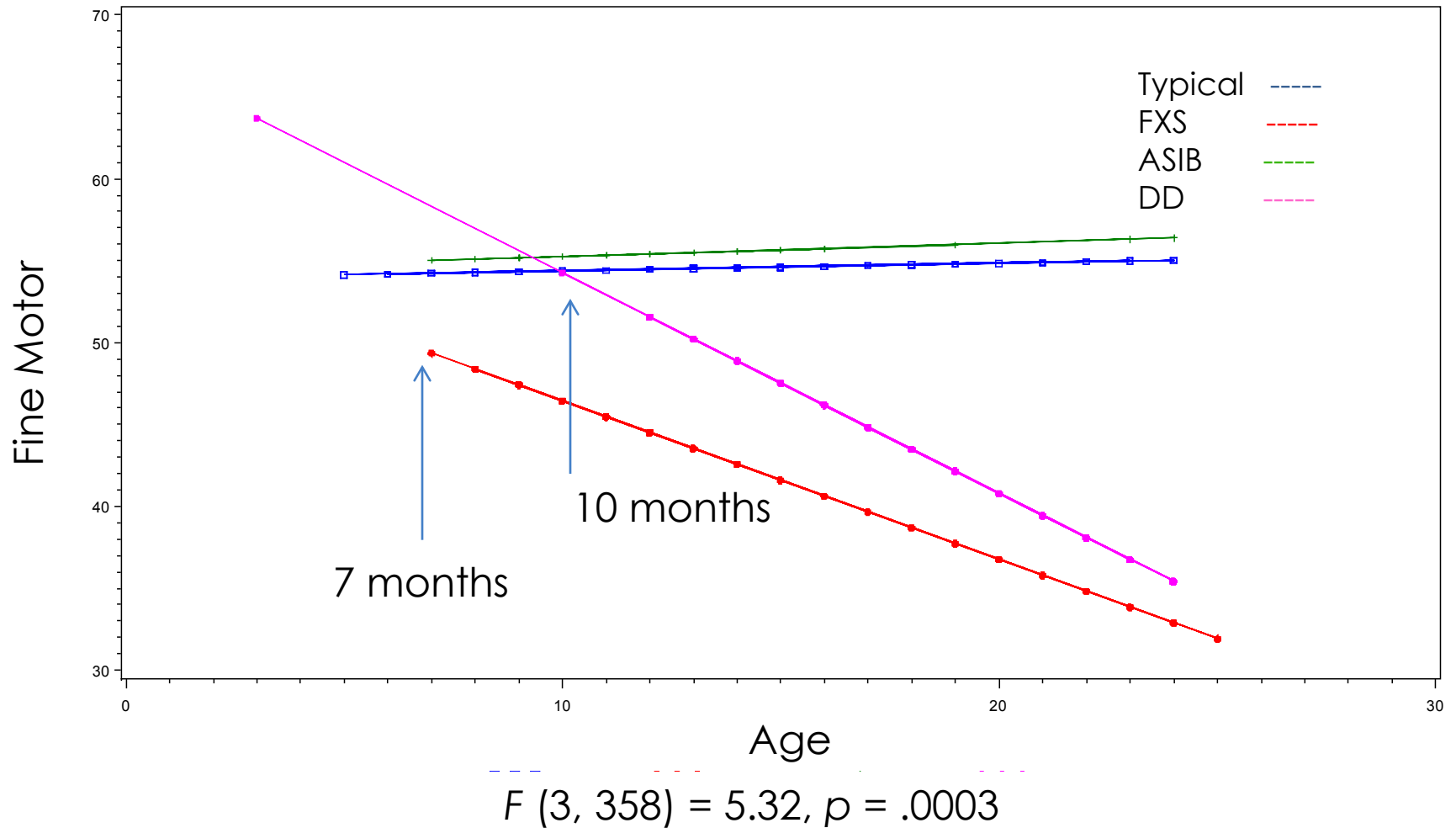


$$F(3, 359) = 5.99, p = .0005$$

# Results Overview

- Early Learning Composite
- Expressive Language
- Receptive Language
- **Fine Motor**
  - > **Age effect for FXS and DD**
- Visual Reception

# Fine Motor

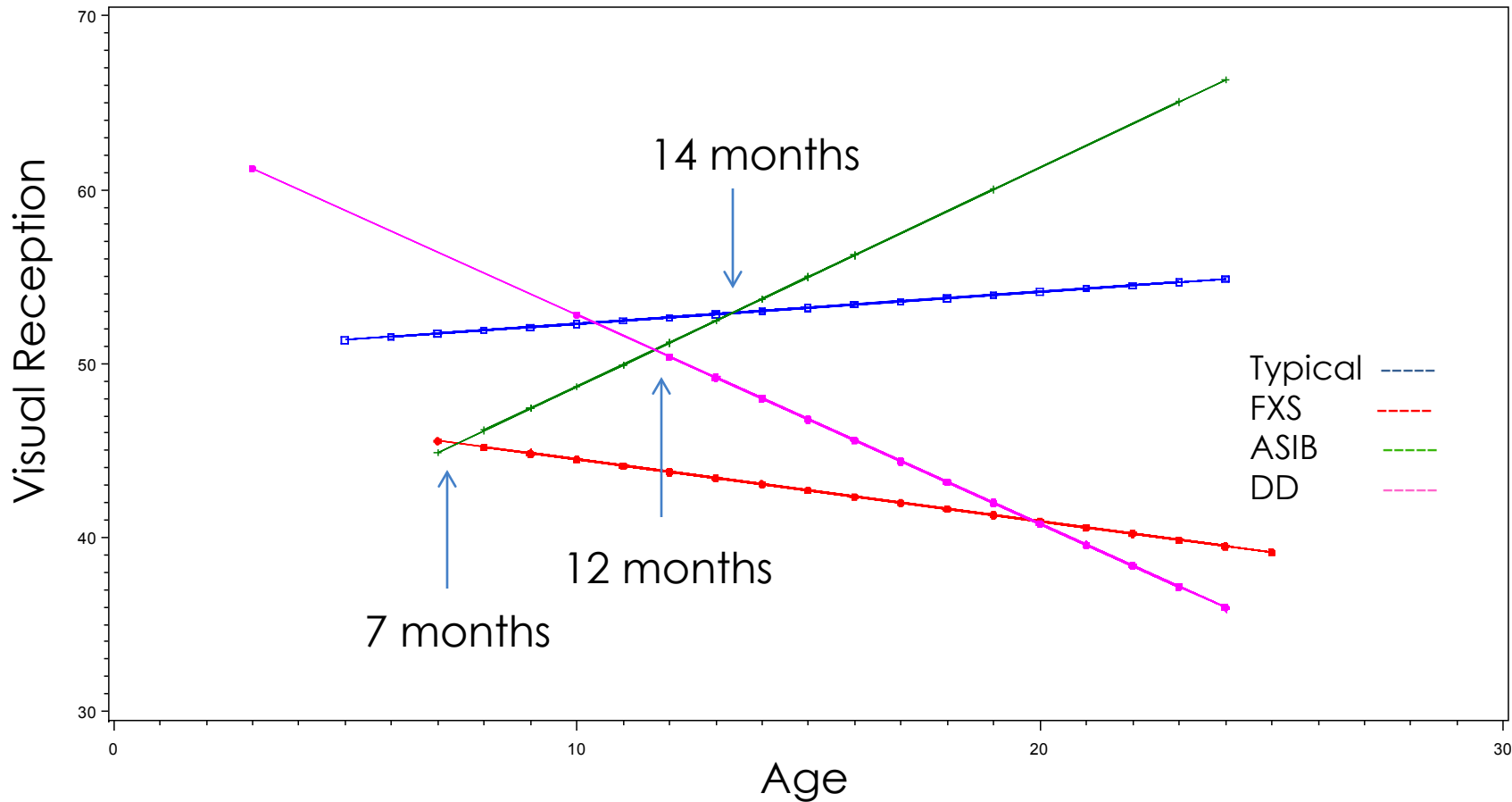




# Results Overview

- Early Learning Composite
- Expressive Language
- Receptive Language
- Fine Motor
- **Visual Reception**
  - > **Age effect for ASIBs and DD**

# Visual Reception



$F(3, 359) = 8.22, p < .0001$

# Results Summary

- FXS differed significant from typicals and ASIBs across all domains with differences evident at:
  - > 7 months- ELC, FM, VR
  - > 8 months- expressive language
  - > 11 months- receptive language
- Clinically significant delays evident at:
  - > 14 months- expressive and receptive language
  - > 15 months- ELC
  - > 16 months- Fine Motor
  - > 20 Months- Visual Reception

# Results Summary

- ◎ FXS group showed earlier delays than DD group for:
  - > Early Learning Composite
    - Until 15 months of age
  - > Fine Motor Skills
  - > Visual Reception
    - Until 20 months of age

# Discussion

- ◎ Preliminary examination of these trends
  - > Delays evident as early as 7 months of age
    - Not “clinically significant” until closer to 14 months of age
- ◎ Understanding early developmental patterns may aid in earlier specification of delays
  - > Differentiating between groups
- ◎ Comparison between groups essential

# Limitations

- ⦿ No diagnostic outcome
- ⦿ Limited sample of ASIBs
- ⦿ Lack of predictors which may be driving relationships

# Future Directions

- ⦿ Longitudinal monitoring
- ⦿ Diagnostic Outcomes
- ⦿ Examining predictors
  - > ASD status/symptoms
  - > Language Level
  - > Level of FMRP

# Acknowledgements

- ◎ **National Institute of Mental Health;**  
R01MH0901194-01A1 (*PI: Roberts*)
- ◎ **National Institute of Child Health and Human Development:** P30-HD003110-35S1 (*PI: Bailey*). 2003 – 2008.
- ◎ Office of Special Education Programs, US **Department of Education** H324C990042 (*PI: Bailey*). 1999 – 2003



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# Now Recruiting!



- Infants with Fragile X Syndrome or Siblings of a Child with Autism
- Adolescents with Fragile X Syndrome or Autism

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