EARLY JOINT ATTENTION SKILLS AS A PREDICTOR OF LANGUAGE OUTCOMES IN A VERY PRETERM SAMPLE

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Introduction

Infants born Very Preterm (VPT) (< 32 gestational weeks) are at risk for delayed language and attentional deficits when compared to full-term (FT) infants,[1,2,] but individual outcomes vary.

Joint attention (JA) is a preverbal skill linked to language development in the FT population, but less is known about this link in the VPT population. Further information could help practitioners better identify infants born VPT who are at heightened risk for language delays.

Here, we evaluated whether four different JA skills (lower-level, LL, and higher-level, HL, initiation and responding to joint attention (IJA and RJA) at 14m CA predict concurrent and later language (20m CA) outcomes among infants born VPT or FT.

Sample Characteristics (*N* = 72):

Child male sex n (%)	43 (59.7%)
Maternal non-white race/ethnicity n (%)	15 (20.8%)
Maternal age (years, $M \pm SD$)	33.19 $\pm$ 5.14
Maternal education (years, ($M \pm SD$)	15.96 $\pm$ 3.07
Preterm birth n (%)	33 (45.8%)
Preterm gestational weeks ($M \pm SD$) 28.09 $\pm$ 2.14 (range = 24-31)	

Preterm & term groups did not differ significantly on child sex, maternal race/ethnicity, maternal age, maternal education, or SES

Methods

Measures:
Early Social Communication Scales (ESCS)[5] – assessed JA at 14 months

- IJA: Use eye contact (LL) and/or gestures (e.g., pointing or showing)(HL) to elicit another's shared attention.[3,4]
- RJA: The ability to follow another's direction of gaze or pointing (LL) or follow line of regard past finger (HL).[3,4]

Preschool Language Scale-Third Edition (PLS -3)[6] – assessed at 14 & 20 months:

- Receptive Language, Expressive Language, Total Language

MacArthur Communicative Development Index-Short Form (MCDI)[7]: assessed at 14 & 20 months

- Maternal reported: Expressive Vocabulary & Gestures
- Word Combinations at 20 months

Data Analysis: Hierarchical regressions were used to assess whether VPT birth or JA skills predicted children's concurrent and later language outcomes.

Results

After controlling for Preterm Status, the following LL RJA HR were significant:

	Model 1		Model 2	
DV: Receptive Language	β	p	β	p
LL RJA	.297	.011	.234	.040
Preterm Status			-.302	.009
R^2		.075	.152	
Final Model Regression Equation			$F(2, 69) = 7.35, p = .001$	

	Model 1		Model 2	
DV: Total Language	β	p	β	p
LL RJA	.265	.025	.197	.083
Preterm Status			-.326	.005
R^2		.057	.148	
Final Model Regression Equation			$F(2, 69) = 7.14, p = .002$	

*PLS-3 TL: reduced to marginal significance.

14m MCDI:

		β	p	β	p
DV: Gestures		β	p	β	p
LL RJA		.321	.006	.222	.032
Preterm Status				-.479	<.001
R^2_{adj}		.090		.303	
Final Model Regression Equation			$F(2, 69) = 16.40 p = <.001$		

20m PLS-3:

	Model 1		Model 2	
DV: Receptive Language	β	p	β	p
LL RJA	.345	.003	.293	.011
Preterm Status			-.254	.026
R^2_{adj}		.107	.157	
Final Model Regression Equation			$F(2, 69) = 7.61, p = 0.001$	

	Model 1		Model 2	
DV: Expressive Language	β	p	β	p
LL RJA	.273	.021	.219	.059
Preterm Status			-.256	.028
R^2_{adj}		.061	.112	
Final Model Regression Equation			$F(2, 69) = 5.49, p = 0.006$	

	Model 1		Model 2	
DV: Total Language	β	p	β	p
LL RJA	.335	.004	.279	.015
Preterm Status			-.271	.018
R^2_{adj}		.099	.159	
Final Model Regression Equation			$F(2, 69) = 7.69, p < 0.001$	

*PLS-3 EL: reduced to marginal significance.

Discussion

Findings confirm prior research showing that **VPT birth is a pervasive risk factor** for delayed language development at 14 and 30 months (CA).

Contrary to expectations, lower-level RJA (but not other JA skills) was a significant predictor of several 14- and 20-month language outcomes.

RJA skills emerge earlier than IJA skills;[3] thus, delays in RJA at 14 months may be a red flag for later language delays and should be included in assessments for infants born VPT.

Interventions to increase JA skills may also help protect against language delays in the VPT population.

Replication of this study with larger, more racially and SES diverse sample is needed and could help confirm or challenge global trends.

References
1. Garner, Landry, & Richardson, 1991
2. Landry, Denson, & Swank, 1997
3. Mundy et al., 2013
4. Morales et al., 2000
5. Mundy, 2013
6. Zimmerman, Steiner, & Pond, 1992
7. Fenson, 2007

VPT birth is a considerable risk factor contributing to children's language development, which is foundational to aspects of children's cognitive and socioemotional development. Interventions to increase joint attention may serve as a protective factor for preterm infants, their parents, parent-child relationships, and children's socio-emotional development.