

Mother and Father Language Input in Low Wealth Rural Families: Predictors of Children's vocabulary and achievement

Acknowledgements
This research supported by NICHD (PO1HD039667)
Cofunding was provided by the National Institute of Drug Abuse,
NIH Office of Minority Health.

*Lynne Vernon-Feagans, Claire Baker and the Family Life Project Key Investigators
The University of North Carolina at Chapel Hill*



Rationale

Maternal language input has been positively and consistently linked to children's developmental outcomes (Hoff, 2003; 2006). In fact, Hart and Risley's (1995) seminal work linked maternal language input to children's vocabulary development, which in turn predicted more advanced emergent literacy skills.

Fewer studies have examined mothers and father language input (Bornstein, Haynes, & Painter, 1998; Pancsofar & Vernon-Feagans, 2006; Pleck, 2010; Tamis-LeMonda, Baumwell, & Cabrera, 2013; Lamb, 2004) and most extant research has focused on urban or middle class families, with much less emphasis on diverse families living in rural poverty. Thus, a deeper understanding of the associations between fathers' and mothers' language input and children's early vocabulary, language and achievement is needed.

Background Literature

Research on maternal language input has found that the amount of talk by mothers as well as the diversity of vocabulary and the complexity by mothers was predictive of children's language (Bornstein et al., 1998; Hart & Risley, 1995; Hoff, 2003; Huttenlocher et al., 2010; Rowe, 1998; Pancsofar et al., 2010).

Researchers have consistently demonstrated that mother-child book-sharing interactions may be an important context for improving children's vocabulary and language (Ninio, 1983; Raikes et al., 2006; Sénéchal & LeFevre, Hudson, & Lawson, 1996; Sénéchal, 2006; Sénéchal & LeFevre, 2002).

Less is known about father language although previous studies have found that father engagement and certain characteristics of father language, such as wh questions and diversity of vocabulary, may be important in understanding children's later development (Tamis-LeMonda et al., 2012; Cabrera et al., 2007; Leech et al., 2013; Pancsofar et al., 2010).

Studies from Family Life Project

- I. Mother and Father Unique and Shared Words at 6 months during a picturebook task in Predicting Child Language at 36 months in Two Parent Families (Vernon-Feagans et al., 2008)
- II. Father and Mother Vocabulary and Complexity during a shared picturebook task at 6 months in predicting child language at 15 and 36 months. (Pancsofar et al., 2010; Odom et al., 2013)
- III. Father and Mother Vocabulary and Complexity during a shared picturebook task at 60 months and children's Language and Academic Performance later in kindergarten (Baker et al., in press)

Method

Sample

A representative sample of every baby born to a mother who lived in one of six poor rural counties over a one year period, oversampling for poverty and African American. 1292 children have been followed since birth with approximately 500 children living in two parent households.

Mother and Father Book-Sharing at 6, 25, 36, and 60 months of age

Mothers and fathers were given a wordless picture book at each of the home visits and asked to go through the picture book with their child. The videos of all picture book sessions between the parent and the child were transcribed using the Systematic Analysis of Language Transcripts (SALT; Miller & Chapman, 1985) software. SALT produces a variety of measures that were used in the various studies reported here, including Mean Length of Utterance (MLU), number of different words, as well as composite measures of vocabulary output and complexity that included a number of variables that made for a richer construct (i.e. complexity was represented by number of turns on a topic, MLU, and # of complex conjunctions).

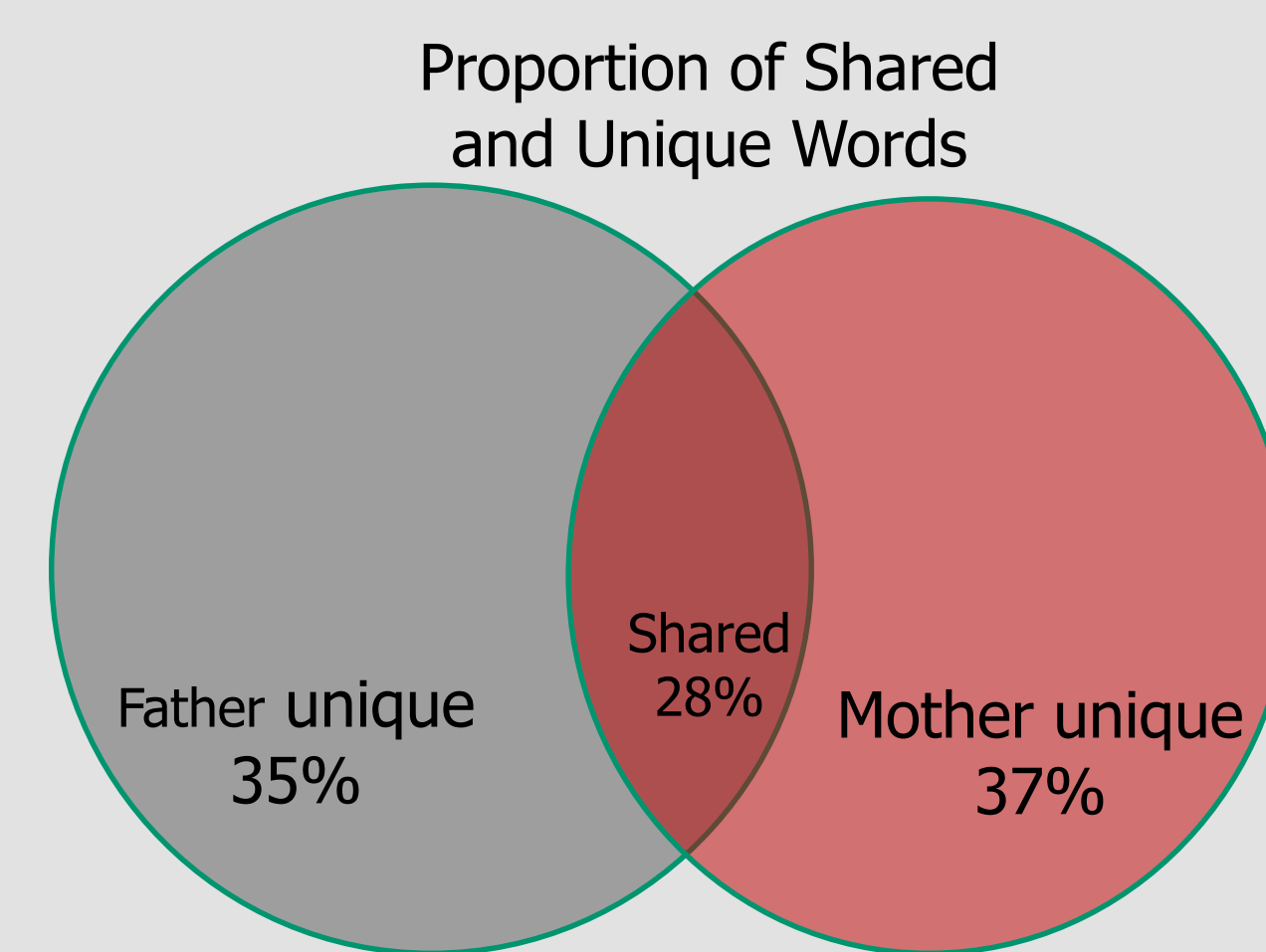
Programming allowed us to create mother and father unique and shared vocabulary at 6 months from SALT transcripts (fathers and mothers used the same book in sessions several weeks apart).

Child Outcomes

CSBS (Wetherby & Prizant, 2002) at 15 months
Preschool Language Scale, (Expressive) 4th Edition (PLS-4; Zimmerman, Steiner, & Pond, 2002) at 24 and 36 months
Wechsler Preschool and Primary Scales of Intelligence (WPPSI - III; Wechsler, 2002) at 36 months
Woodcock Johnson Tests of Achievement at kindergarten

Letter Word Identification
Picture Vocabulary
Applied Problems

I. Mother and Father Unique and Shared Vocabulary



African American mothers and fathers had more unique words but no other race differences. Fathers used more deictic terms (see word list below). Father language predicted child language better than mother language.

Regression Table: Child NDW

	Model 1	Model 2	Model 3	Model 4
	β	SE B	β	SE B
1. Income-to-needs	.08	.87	.08	.85
2. State	-.15**	2.58	-.15*	2.58
3. Marital Status	.03	2.98	.03	2.93
4. Child Race	-.19**	3.36	-.19**	3.35
5. Child Gender	.06	2.10	.06	2.07
6. Mother Age	.08	.30	.08	.30
7. Father Age	-.07	.23	-.07	.23
8. Mother Education	.04	.71	.02	.72
9. Father Education	.05	.62	.06	.62
10. Mother Employed	.00	2.33	.00	2.33
11. Father Employed	-.04	3.67	-.04	3.62
12. Baseline			.08	.13
13. Mother Unique Words				.12**
14. Father Unique Words				.20***
15. Shared Words				.15**
N	426		426	426
R ²	.05		.08	.07

p < .05 **p < .01 ***p < .001

Father and Mother Unique Words

Mother Unique words	Father Unique words
Kiss	Lookie
Say	Go
Lookie	Don't
Cry	Come
Gonna	No
Eat	Can
Bath	One
Peekaboo	
Mommy	
Child	
Face	
Sad	
Happy	
Sleepy	
	Here
	There
	Now
	Just
	Right
	Alright
	I
	Your
She	
His	

Regression Table: Child MLU

	Model 1	Model 2	Model 3	Model 4
	β	SE B	β	SE B
1. Income-to-needs	.01	.03	.01	.03
2. State	-.23***	.08	-.24***	.08
3. Marital Status	.08	.10	.08	.10
4. Child Race	-.15**	.11	-.15**	.11
5. Child Gender	.03	.07	.03	.07
6. Mother Age	.06	.01	.06	.01
7. Father Age	-.12	.01	-.12	.01
8. Mother Education	.06	.02	.07	.02
9. Father Education	.05	.02	.05	.02
10. Mother Employed	-.01	.08	-.01	.08
11. Father Employed	-.05	.12	-.05	.12
12. Baseline			-.04	.00
13. Mother Unique Words				.01
14. Father Unique Words				.13*
15. Shared Words				.01
N	424		424	424
R ²	.04		.04	.04

p < .05 **p < .01 ***p < .001

II. Mother and Father Vocabulary in infancy

Model		CSBS at 15 months	PLS at 36 months
Step 1: Demographic controls	F (R²)	5.15**** (.05)	11.57**** (.12)
State (PA = 1)	B (se)	1.04 (1.54)	-2.32 (1.74)
Hours/week in childcare	B (se)	-0.00 (.04)	0.10* (.04)
Income-to-needs ratio	B (se)	1.26** (.40)	2.38**** (.41)
Ethnicity (African American = 1)	B (se)	-3.01 (1.97)	-7.81**** (2.17)
Child distress	B (se)	2.30** (.84)	0.73 (.94)
Birth order (first born = 1)	B (se)	2.78 (1.41)	-0.65 (1.55)
Step 2: Maternal characteristics	F (ΔR²)	0.79 (.00)	7.57**** (.04)
Maternal education	B (se)	0.32 (.39)	1.99**** (.42)
Maternal time with book	B (se)	0.00 (.01)	0.01 (.01)
Maternal vocabulary	B (se)	-0.02 (.03)	0.01 (.03)
Step 3: Paternal characteristics	F (ΔR²)	3.10* (.02)	3.12* (.02)
Paternal education	B (se)	-0.38 (.40)	0.89* (.44)
Paternal time with book	B (se)	-0.01 (.01)	-0.02 (.01)
Paternal vocabulary	B (se)	0.08** (.03)	0.06* (.03)

p < .05 **p < .01 ***p < .001 ****p < .0001

III. Mother and Father Vocabulary and Complexity at Kindergarten

Independent variable	Letter Word ID			Picture vocab			Applied Prob		
	B	SE B	β	B	SE B	β	B	SE B	β
Step 1: Demographic controls									
State (PA=1)	-1.05	1.53	-0.04	-0.33	1.40	-0.01	1.30	1.66	0.05
Income-to-needs ratio	1.37**	0.46	0.20	1.22**	0.42	0.20	0.62	0.50	0.08
Race (African American=1)	3.29	1.96	0.11	-3.52*	1.78	-0.13	-5.45*	2.13	0.16
Maternal age	0.16	0.16	0.07	0.08	0.15	0.04	0.25	0.18	0.11
Paternal age at home	-0.19	0.14	0.10	0.01	0.12	0.01	-0.15	0.15	0.07
Maternal education	0.79*	0.35	0.16	0.56	0.31	0.12	0.89*	0.38	0.16
Paternal education	0.02	0.31	0.01	0.08	0.28	0.01	0.33	0.33	0.06
Step 2: Maternal language input									
Maternal number of different words	0.01	0.01	0.03	0.01	0.02	0.05	0.01	0.02	0.03
Maternal MLU	1.03	0.76	0.08	0.66	0.69	0.05	2.09*	0.82	0.14
Step 3: Paternal language input									
Paternal number of different words	0.01	0.02	0.02	0.03	0.01	0.09	0.01	0.02	0.01
Paternal MLU	0.90	0.77	0.07	1.54*	0.69	0.13	2.37**	0.83	0.16

The above two studies found that in preschool and at school age, father language during a shared picture book task was more predictive of child language and achievement than mother language, with paternal vocabulary more important at 36 months of age and maternal and paternal language complexity important for kindergarten math achievement but only father language important for vocabulary in kindergarten.

Conclusions

This is one of the largest studies conducted of mother and father language input during a shared picture book task in the home. In this rural sample, Mother and Father language were remarkably similar in the number of different words and MLU, etc. In infancy, mothers and fathers generally used unique vocabulary using the same book with their infant. AA parents used more unique words. Fathers used more deictic terms than mothers.

As other studies have found, father and mother education was also an important predictor of child language, even in this sample of mostly low-income families.

Yet, even with demographic controls and mother language variables included in regressions, father language is a more powerful predictor of child language at 36 months and kindergarten, and math in kindergarten, in comparison to mother language. More research is needed on better understanding why fathers are accounting for more unique variance in child language at preschool and at school entry.