

Background

- Much of the research on early mathematics development focuses on number skills and how parents support them (Casey et al., 2016; Levine, Suriyakham, Rowe, Huttenlocher & Gunderson, 2010; Sarama & Clements, 2004; Skwarchuk, Sowinski & LeFevre, 2014).
- Previous research reveals that parent-child talk about number concepts with their young children predicts early and later math knowledge (Casey et al., 2016; Levine et al., 2010; Ramani, Rowe, Eason & Leech, 2015).
- Parents tend to talk about foundational more than advanced number concepts while playing with their children (Vandermaas-Peeler, Boomgarden, Finn & Pittard, 2012).
- Emerging evidence shows that early patterning skills are also important predictors of children's later mathematics achievement (Rittle-Johnson, Fyfe, Hofer & Farran, 2017).
- Further, adults can support preschoolers' patterning skills by providing input on patterning concepts (Fyfe, McNeil & Rittle-Johnson, 2015; Rittle-Johnson, Fyfe, Loehr & Miller, 2015).
- However, little is known about parent-child talk about patterning, how it compares in frequency and complexity to their talk about numbers, or how parents' and children's patterning talk are related.

Questions

- How frequently do parents and their preschool children talk about patterning in relation to numbers during play?
- How do parents' and children's talk about advanced and foundational patterning concepts differ in frequency?
- To what extent are parents' and children's advanced and foundational patterning talk related?

Participants

- Thirty-five preschoolers ($M=4.05$ years, $SD=.28$) along with one of their parents were recruited from 6 public and private preschools in a Southeastern U.S. city.
- Preschoolers were mostly male (60%) and most received no financial assistance (60%). A little over half of children were racial and ethnic minorities (52%) including 43% Black students, 3% Asian, and 3% Hispanic.
- Most of the parents were mothers (80%), half identified as White (51%), and 57% of mothers and 50% of fathers reported having Associate's, Bachelor's, or Graduate degrees.

For more information, please contact Ashli-Ann Douglas:
ashli-ann.l.douglas@vanderbilt.edu

Method

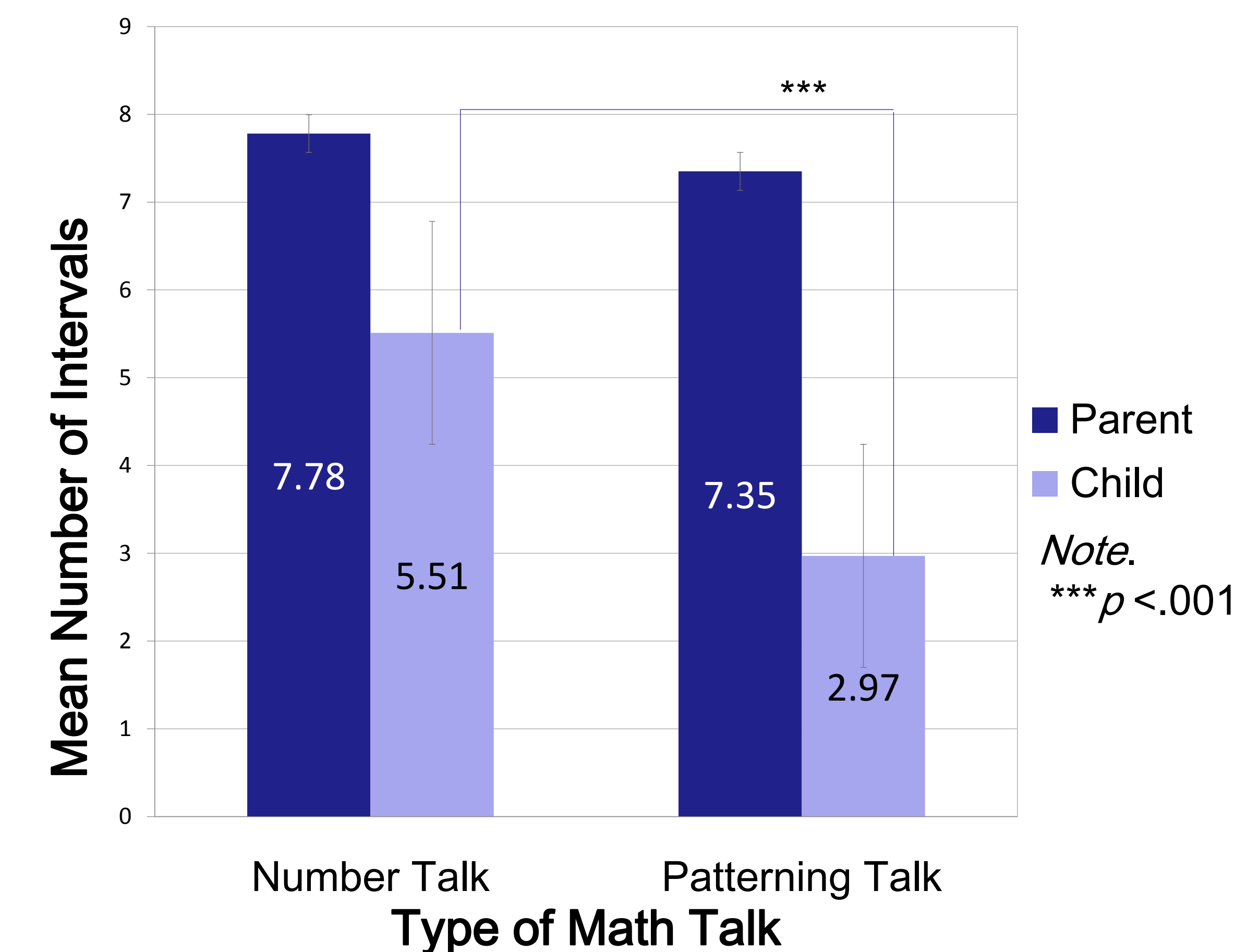
- Parent-child dyads engaged in a videotaped "Three-Bags Task" (Vandell, 1979) in which they played with the contents of three separate, randomly ordered bags.
- The three bags included beads with laces, playing cards, Lego blocks, and suggestion cards with ways to play with each toy.
- Parent and child number and patterning talk and behaviors were coded separately in 10-second intervals for the total time dyads spent playing ($M=22.22$ minutes, $SD=4.65$ minutes) using the coding schemes below.

Coding Scheme					
Code	Definition	Parent		Child	
		M	SD	M	SD
Number Codes					
Advanced					
Advanced Operations	Adds/subtracts two numbers	7.30	1.07	.09	.33
Magnitude Comparison	Compares two numbers/ quantities	8.00	6.54	5.62	5.65
Foundational					
Numeral Identification	Identifies a written numeral	7.46	6.95	7.68	6.57
Set Labeling	Labels or asks about number of items in a set	6.75	4.18	3.52	3.31
Count Objects	Counts or discusses counting objects as a strategy	2.50	4.00	3.16	3.65
Ordinal Relations	Describes or asks question about order of numbers	2.02	2.08	1.04	2.21
Rote Counting	Counts numbers sequentially.	.09	.34	.19	.68
Number Other	Uses a number in another way.	.38	.76	.46	.81
Relative Magnitude	Makes a general statement about quantity	4.75	2.73	2.51	2.28
Patterning Codes					
Advanced					
Identify Pattern Unit	Explicitly identifies the pattern unit	.16	.37	.00	.00
Link Patterns	Links the individual items in two patterns.	.26	1.5	.05	.21
Label Items in Order	Names at least 2 consecutive items in a pattern	2.82	3.26	1.85	1.97
Identify Patterns	Explicitly refers to a pattern	2.50	2.50	1.68	1.98
Foundational					
What Comes Next/First	Asks or says what comes next/first in a pattern	3.78	2.74	3.36	3.31
Non-verbal pattern creation	Creates at least one unit of a pattern, without discussing	1.90	2.71	4.50	3.50
Gestures to Pattern	Points to or sweeps over a pattern with no talking	.00	.00	.06	.20
Compares objects	Notices similarities and differences between objects	.77	1.20	.39	1.03

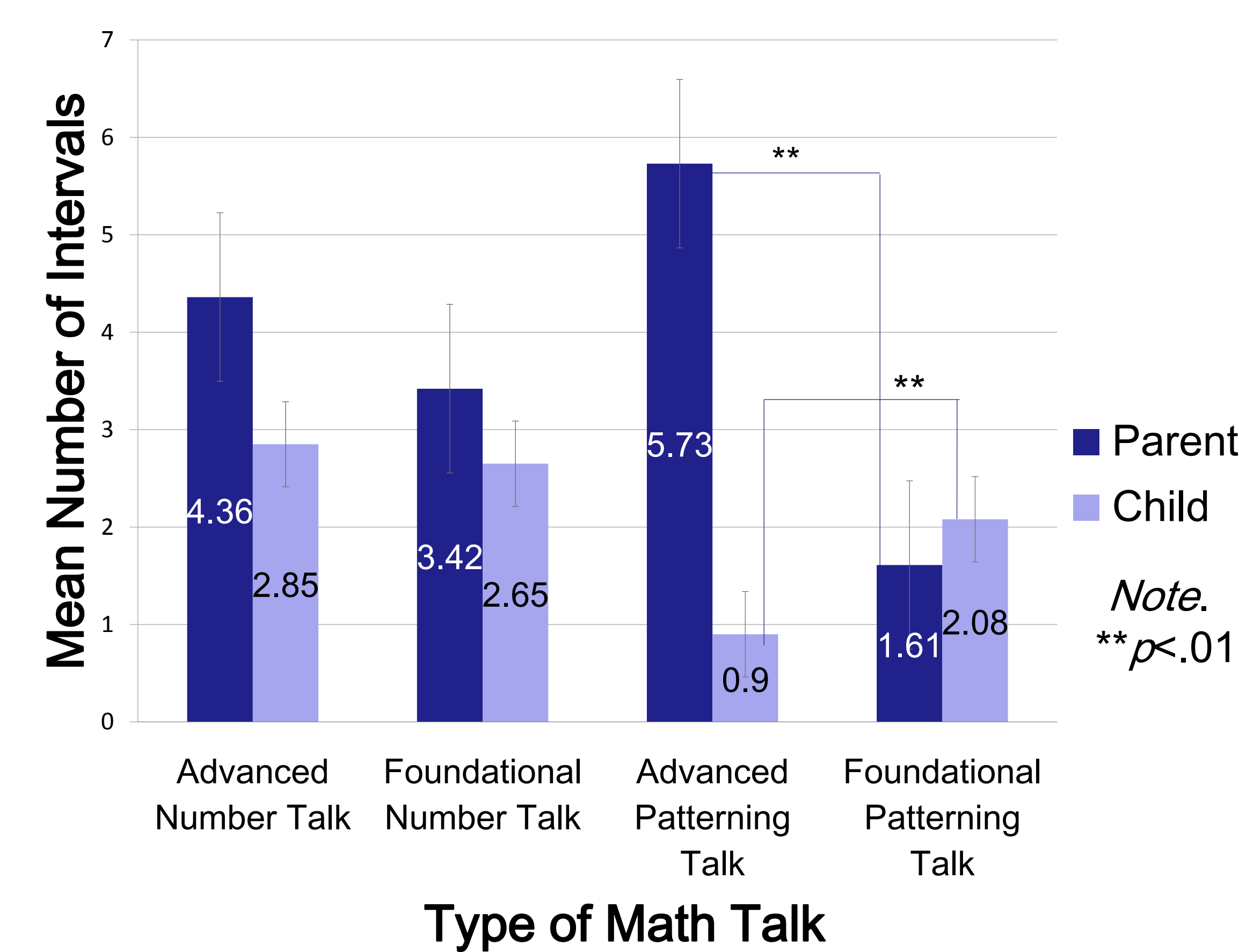
Notes. Values represent average number of 10-second intervals

Results

Frequency of Total Number and Patterning Talk



Complexity of Number and Patterning Talk



Correlations Between Parents' and Children's Number Talk

	Parent Advanced	Parent Foundational
Child Advanced	.57**	-.40*
Child Foundational	-.25	.63**

Notes. Child age and vocabulary were controlled for in analyses.
* $p < .05$ ** $p < .01$, $df=31$

Correlations Between Parents' and Children's Patterning Talk

	Parent Advanced	Parent Foundational
Child Advanced	.61**	-.20
Child Foundational	.16	.54**

Notes. Child age and vocabulary were controlled for in analyses.
* $p < .05$ ** $p < .01$, $df=31$

Discussion

- The findings indicate that preschool children tend to talk about numbers more frequently than they talk about patterns while their parents' number and patterning talk do not differ significantly in frequency.
- Further, children displayed interest in and ability to focus on more advanced patterning concepts though their parents' talk about advanced and foundational patterning concepts did not differ significantly in frequency.
- The positive correlations between parents' talk about advanced and foundational patterning and number concepts and their children's respective talk suggest that parents may be able to increase how frequently their children think and talk about advanced early number and patterning concepts by talking with them about such concepts.
- Alternatively, findings might indicate that children with advanced number and patterning knowledge elicit discussion of advanced number and patterning concepts from their parents.
- Further research is needed to determine how patterning and number talk vary by toy type, how researchers might promote the frequency and complexity of patterning and number talk, and how this talk predicts children's later number, patterning, and general math skills.

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