

Manipulation complexity from 9-14 months predicts language ability at 2, 3, and 5 years



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Kaityn Contino @Kaityn\_Contino

BACKGROUND:

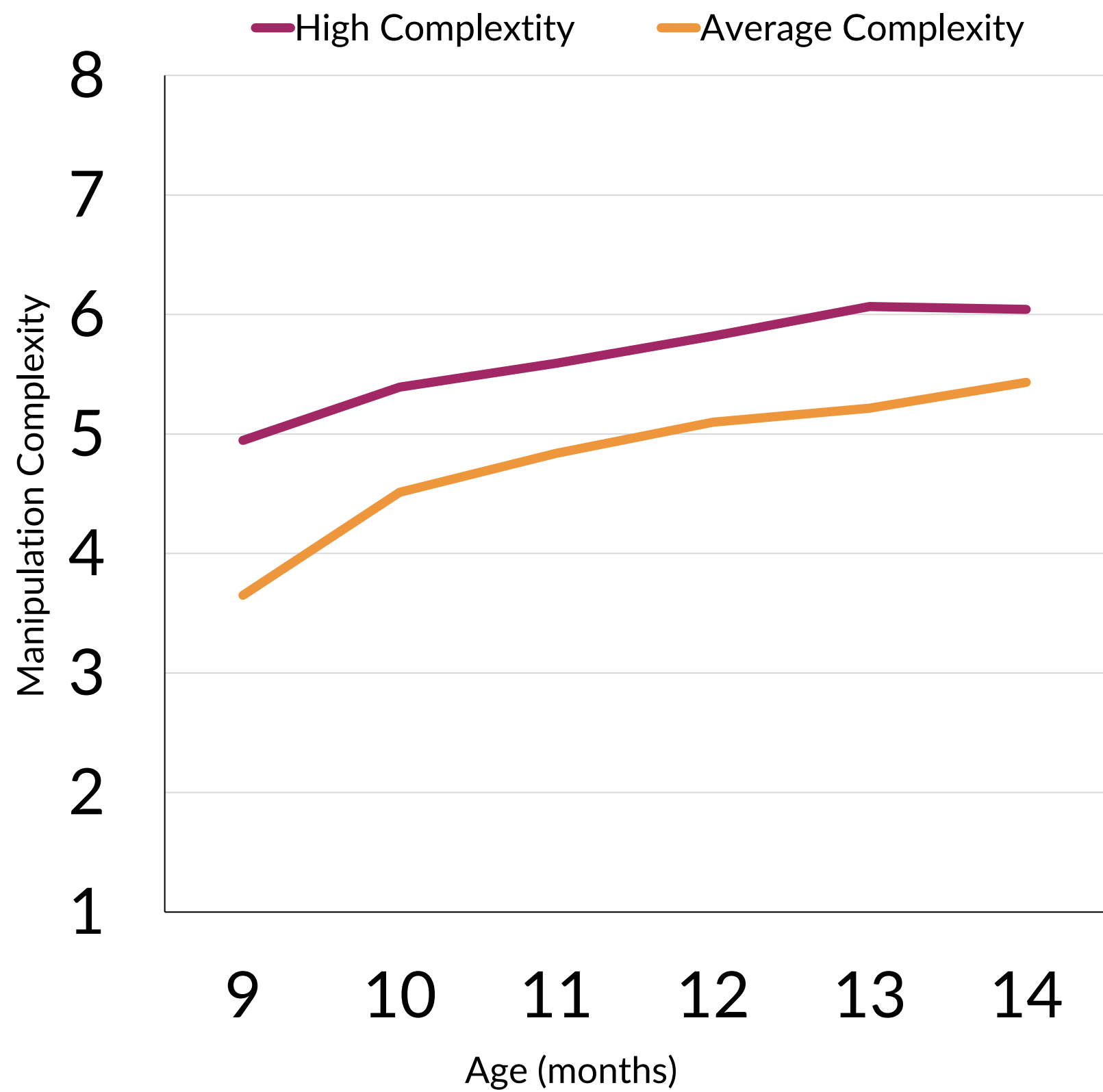
- Gains in early motor skills like sitting and walking predict advanced later language.
- Differences in how infants manipulate objects (measured as **complexity trajectories**) may be a novel way to **index fine motor skill**.
- Hypothesis:** What babies do with their hands is tied to their language learning environments through a **motor-language cascade**

METHODS:

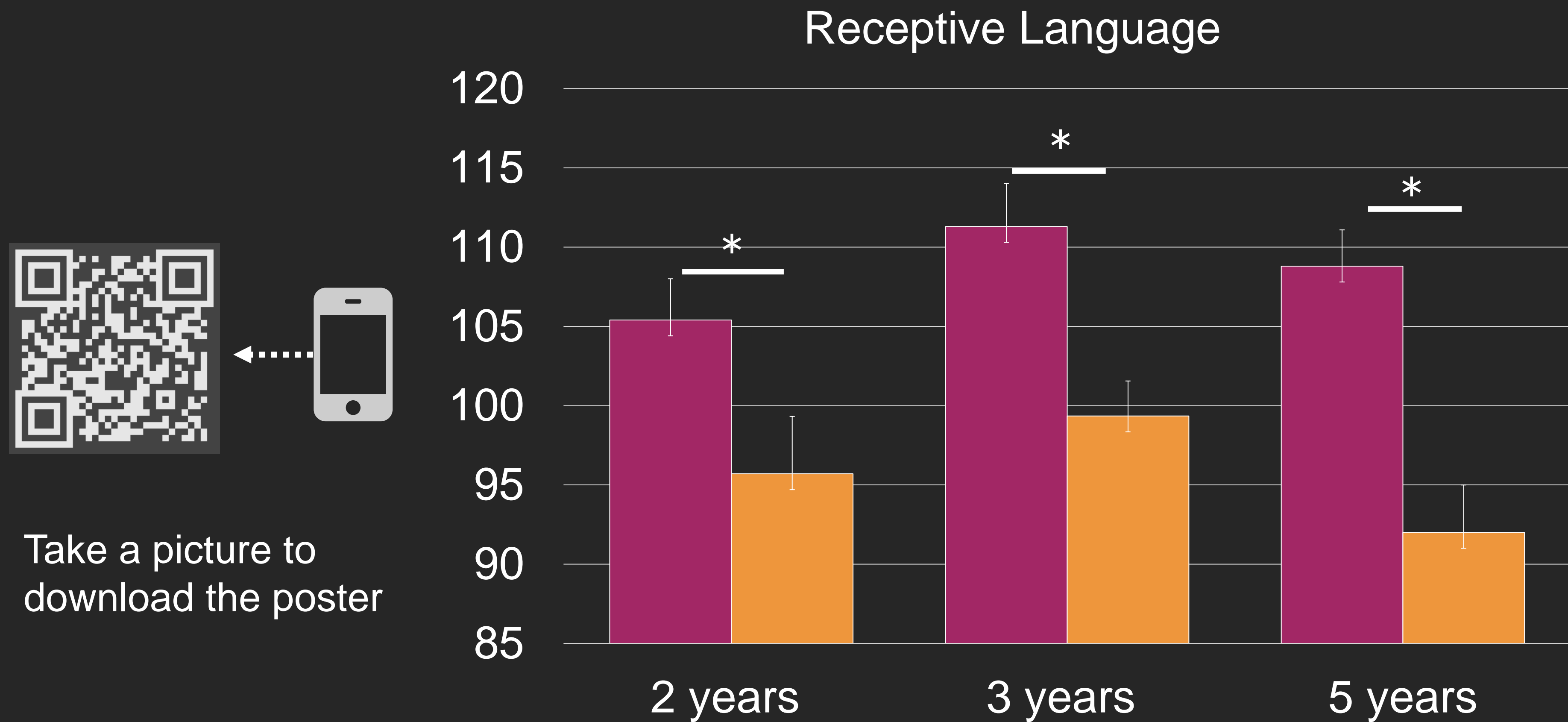
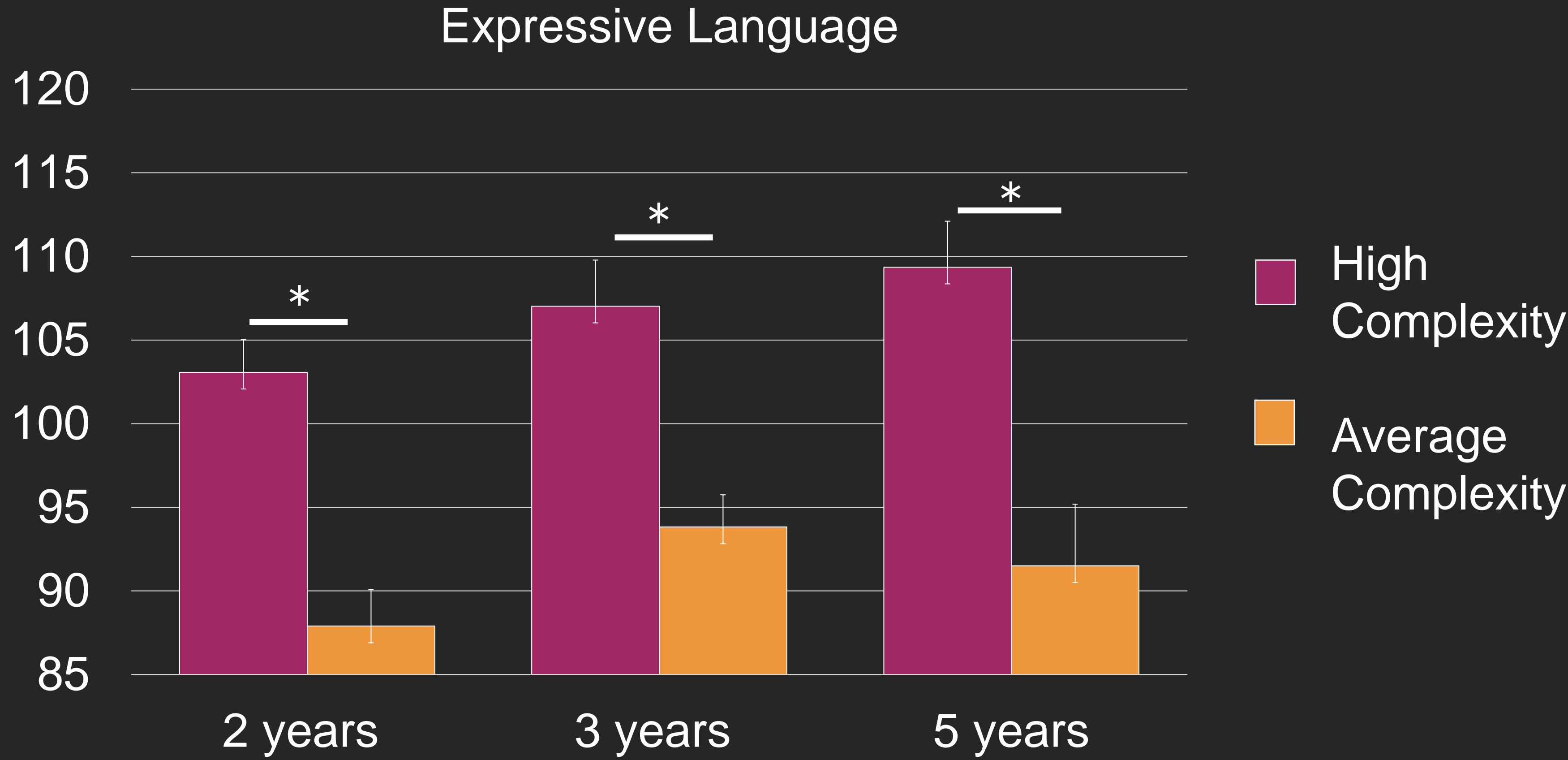
- 90 infants participated in the project.
- Manipulation complexity was coded from video for 6 visits from 9 to 14 months.
- Language was assessed using the Preschool Language Scales for 3 visits at 2, 3, and 5 years.

RESULTS:

Two complexity patterns (high/average) were identified using latent class growth analysis.



Infants with **more complex manipulation** had **greater language skills** at 2, 3, and 5 years.



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Infants manipulated 13 toys one at a time **P1-018**



Each toy got a **complexity score** from 1 to 8. Analysis used an average per infant per month.

Manipulation Complexity Level	Is there more than one object?	Is there more than one hand?	Independent finger movement?	Are the hands doing different things?
8	Yes	Yes	Yes	
7	Yes	Yes	No	
6	No	Yes	Yes	Yes
5	No	Yes	Yes	No
4	No	No	Yes	
3	No	Yes	No	Yes
2	No	Yes	No	No
1	No	No	No	

2/3 of infants were in the **high complexity** class

Class	N	Intercept	Slope	Quadratic Slope
2 years				
High Complexity	72	4.935*	0.431*	-0.043*
Average Complexity	19	3.672*	0.649*	-0.061*
3 years				
High Complexity	65	4.953*	0.427*	-0.041*
Average Complexity	26	3.831*	0.629*	-0.063*
4 years				
High Complexity	63	5.001*	0.411*	-0.041*
Average Complexity	28	3.845*	0.646*	-0.063*

K. Contino<sup>1</sup>, J.M. Campbell<sup>2</sup>, E.C. Marcinowski<sup>3</sup>, G.F. Michel<sup>4</sup>, and E.L. Nelson<sup>1</sup>

<sup>1</sup>Florida International University

<sup>2</sup>Illinois State University

<sup>3</sup>Louisiana State University

<sup>4</sup>University of North Carolina Greensboro