





# A Word-Learning Intervention Utilizing Principles of Retrieval-Based Practice: A Single-Case Design with 4- to 7-year-old Children with Developmental Language Disorder

Katherine Gordon, Holly Storkel, Stephanie Lowry, & Mollee Sultani

## Introduction

- **Retrieval-based practice** increases word learning and retention in children with Developmental Language Disorder (DLD) more than **passive exposures**.
- Current research with retrieval-based practice focuses on lab-created words linked to concrete objects.

Lab Based Task (Word Form)	Intervention Task (Word Form)	Intervention Task (Word Meaning)
<b>Presentation</b> This is a <i>duver</i> . You say <i>duver</i> . 	<b>Presentation</b> I like to eat strawberries in the summertime. They are <i>ripe</i> . You say <i>ripe</i> . 	<b>Presentation</b> <i>Ripe</i> means full grown and good to pick or eat. <i>Ripe</i> is like ready.
<b>Retrieval Prompt</b> What is this one called?	<b>Retrieval Prompt</b> I like to eat strawberries in the summertime. They are....	<b>Retrieval Prompt</b> What does <i>ripe</i> mean?
<b>Feedback</b> This is a <i>duver</i> . 	<b>Feedback</b> They are <i>ripe</i> . 	<b>Feedback</b> <i>Ripe</i> means full grown and good to pick or eat.

## Key Questions

1. Do children with DLD demonstrate effective learning and retention of real words with abstract meanings (Tier 2) when they are taught in an intervention using principles of retrieval-based practice?
2. How does children's performance in the intervention with Tier 2 words compare to children's performance in past research with lab-created words linked to concrete objects?

## Methods

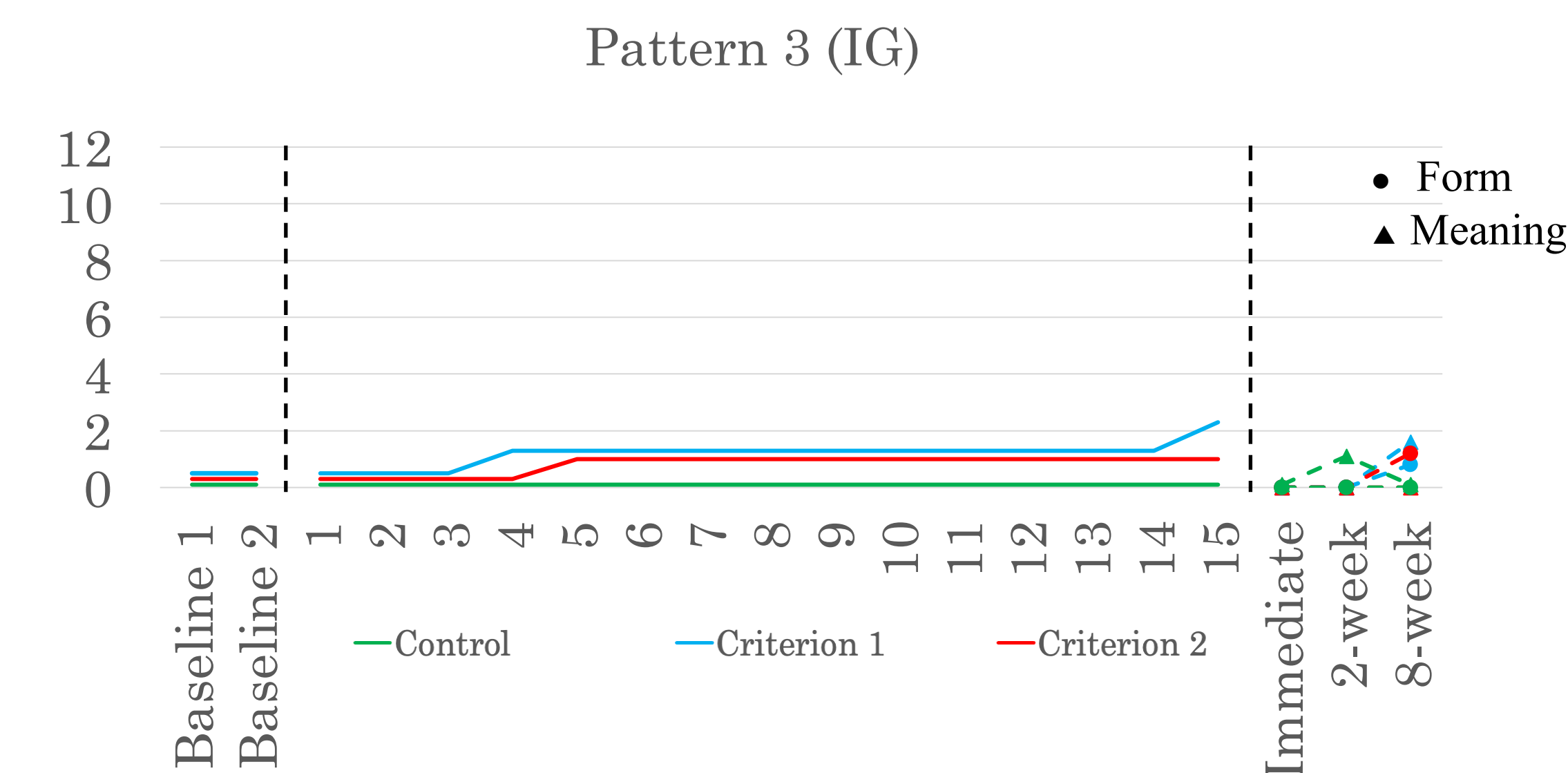
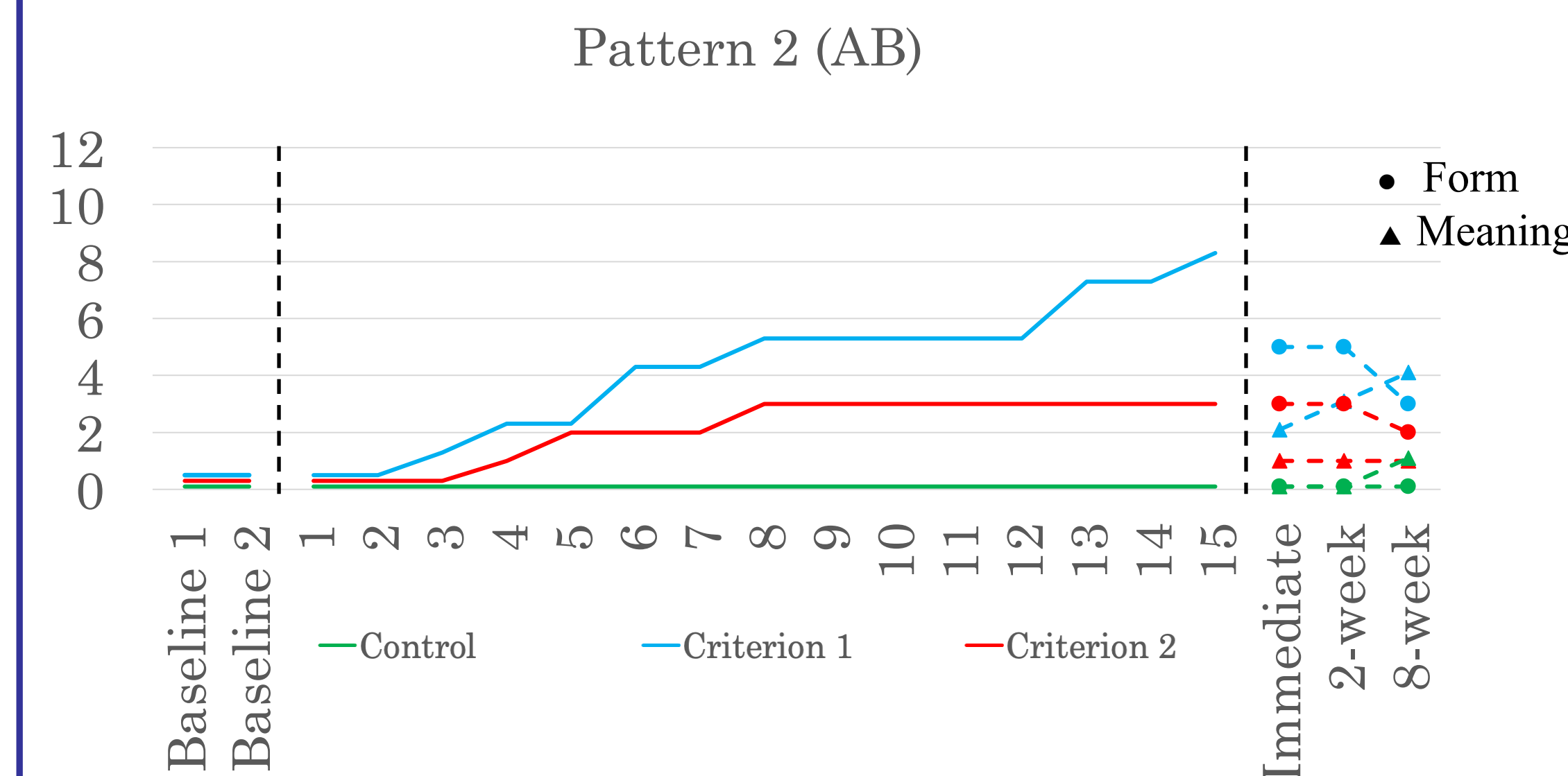
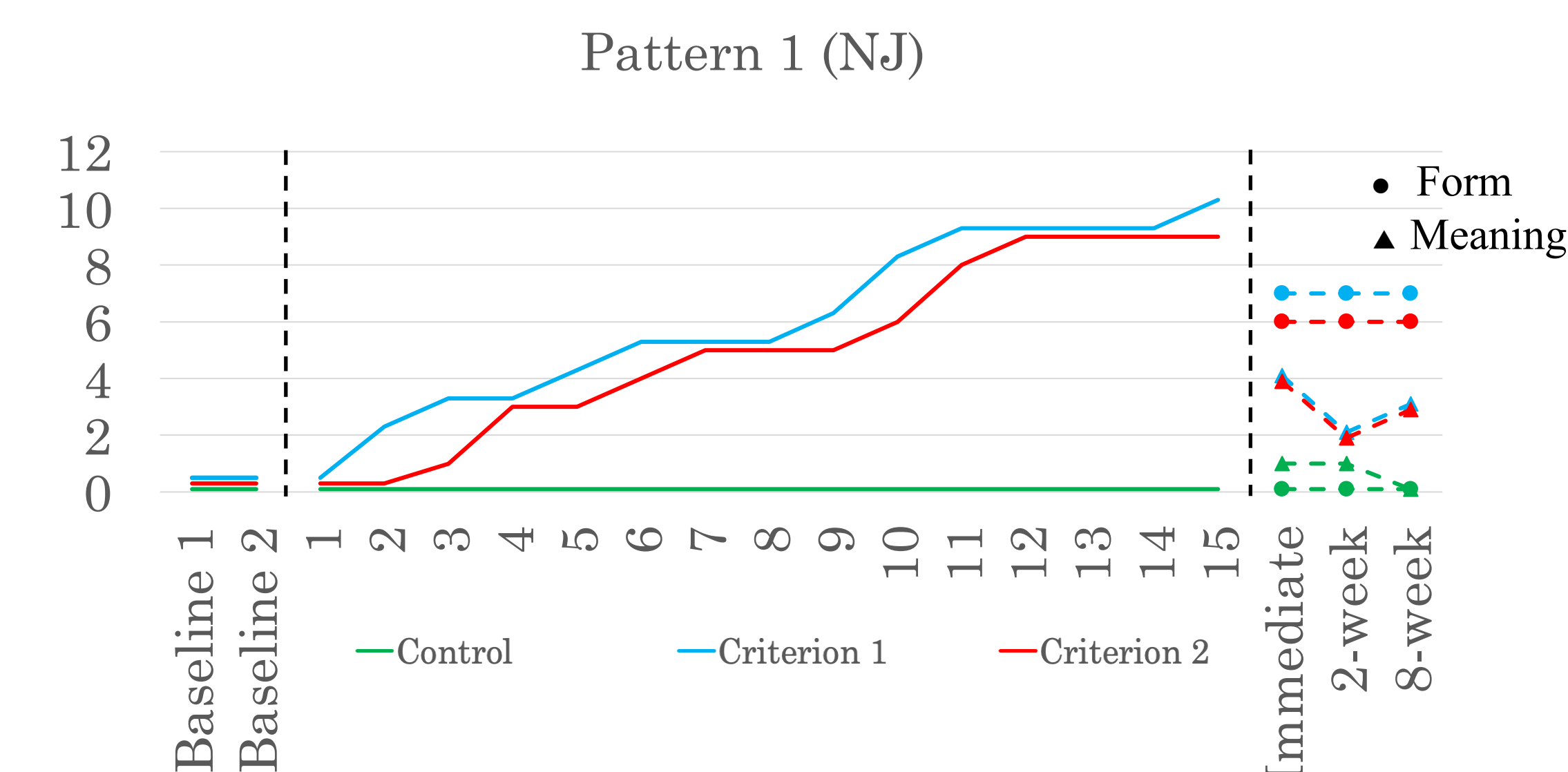
- **Participants:** 7 children with DLD (F = 4, M = 3), age 4 - 7 (mean = 68.71 months).
- **15 sessions:** 2 sessions a week for 7.5 weeks.
- Children were trained with four words at a time via **retrieval-based practice** with feedback.
- **Criterion-based approach:** Children were trained on a word until they produced the correct form and meaning at the beginning of 2 sessions or completed 7 total sessions with the word. Thus, dosage was tailored per word within child.

## Results

	Included In Training	Criterion (1 session)	Criterion (2 sessions)	Immediate Retention	2-Week Delay	8-Week Delay	
Pattern 1	NJ	13 words	10 words	9 words	Form = 8, Meaning = 4	Form = 9, Meaning = 2	Form = 7, Meaning = 3
	JS	13 words	10 words	9 words	Form = 9, Meaning = 6	Form = 8, Meaning = 5	Form = 5, Meaning = 1
	BW	13 words	8 words	8 words	Form = 11, Meaning = 8	Form = 11, Meaning = 5	Form = 6, Meaning = 3
	MW	13 words	8 words	8 words	Form = 7, Meaning = 3	Form = 6, Meaning = 2	Form = 5, Meaning = 0
2	AB	12 words	7 words	3 words	Form = 6, Meaning = 2	Form = 5, Meaning = 3	Form = 4, Meaning = 5
	CH	12 words	5 words	3 words	Form = 4, Meaning = 4	Form = 5, Meaning = 5	Form = 2, Meaning = 0
3	IG	12 words	2 words	1 word	Form = 1, Meaning = 1	Form = 3, Meaning = 0	Form = 2, Meaning = 1

Children demonstrated 3 distinct patterns:

- **Pattern 1 (n = 4)** Children achieved a criterion of 2 sessions with the majority of words.
- **Pattern 2 (n = 2)** Children achieved a criterion of 1 session with the majority of words but demonstrated difficulty achieving a criterion of 2 sessions.
- **Pattern 3 (n = 1)** Child demonstrated difficulty achieving a criterion of 1 or 2 sessions with all words.



Perseveration	Target Definition	Session 6	Session 7	Session 8	Session 9	Session 10	Session 11	Session 12
	<i>Ruffle</i> means to move something that is even to make it messy.	The something what stays together and it kinda falls apart.	To something what moves apart.	There something what moves apart.	Something what moves apart.	Them moves apart.	You, them moves apart.	Um, them move apart.

## Conclusions

- Children demonstrated learning comparable to the number of words learned in other interventions with children with typical development of a similar duration.
- In contrast to research with lab-created words and objects, children showed better learning and retention of **forms** than **meanings**.
- Children demonstrated learning from training and retrieval prompts. However, sometimes children perseverated on incorrect answers for meaning prompts despite further training and feedback.

## Training

### Form Training

I like to eat strawberries in the summertime. They are *ripe*. You say *ripe*.



### Form Prompt

I like to eat strawberries in the summertime. They are....

**Feedback:** They are ripe.

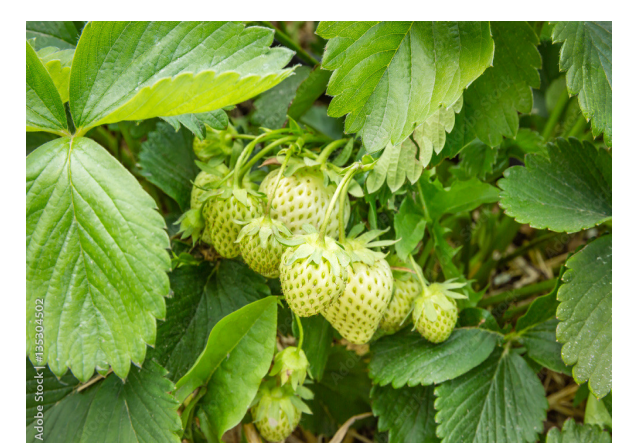
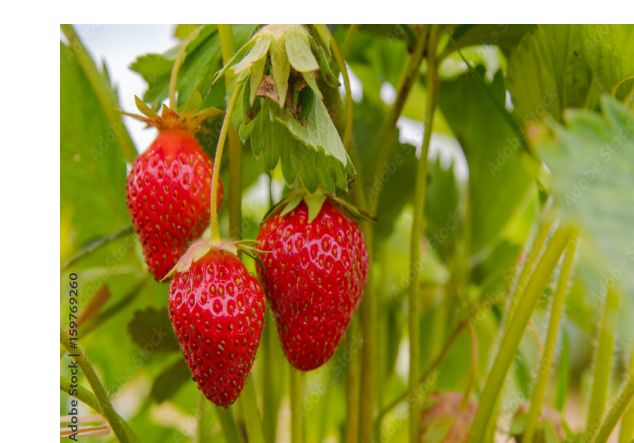


### Meaning Training



Max and Johnny went to a strawberry farm with their grandparents. They found red and green strawberries. The red strawberries are *ripe*. *Ripe* means full grown and good to pick or eat. *Ripe* is like ready.

### Meaning Prompt (1)



Which picture shows *ripe*?  
**Feedback:** This picture shows *ripe*. *Ripe* means good to pick or eat.

### Meaning Prompt (2)

What does *ripe* mean?  
**Feedback:** *Ripe* means full grown and good to pick or eat.

## Acknowledgements

- This project was funded by Boys Town National Research Hospital.
- Abby Gunian and Paige Schlachter provided essential assistance with fidelity coding.
- The authors report no financial or other conflict of interest