



# Evaluating Text Complexity at Different Writing Development Stages for Students with Significant Cognitive Disabilities

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# Writing for Students with Significant Cognitive Disabilities (SCD)

- Students with SCD demonstrate diverse learning and communication skills, and mobility challenges.
- Their writing ability may reflect the knowledge and skills of emergent writers.
- No systematic samples of written products produced by students with SCD currently exist.

# Developmental Writing Scale

- The Developmental Writing Scale (DWS; Sturm et al., 2012) is a 14-point ordinal scale of qualitative advances in writing development.
- It is instructionally relevant, appropriate for diverse writers, and stable and valid for measuring student growth.

# Schuster et al. (2021)

- Investigated the general characteristics of 413 grade-level writing samples produced by students with SCD
- Categorized DWS levels into four writing development stages

*Assignment of DWS levels to writing development stages arising from the initial study*

Writing Development Stage	DWS Levels
Emergent Writing	Level 1: Drawing
	Level 2: Scribbling
Letter Production	Level 3: Letter strings (no groups)
	Level 4: Letter strings grouped in words
Word Production	Level 5: One intelligible word
	Level 6: Two or three intelligible words
	Level 7: Three or more different intelligible words in a list
Text Production	Level 8: Partial sentence of more than three words
	Level 9: One or two complete sentences
	Level 10: Three or more unrelated sentences (neither coherent nor cohesive)
	Level 11: Three or more related sentences (coherent but limited cohesive)
	Level 12: Three or more related sentences that cannot be reordered (coherent and cohesive)
	Level 13: Two coherent paragraphs of at least three cohesive sentences each
	Level 14: Three or more coherent paragraphs of at least three cohesive sentences each

# Schuster et al. (2021)

*Assignment of the student writing samples per writing development stage in each grade based on their assigned DWS level from the initial study*

Grade Level	Emergent Writing (%)	Letter Production (%)	Word Production (%)	Text Production (%)	Average Rating (SD)
3	0	5	32	64	8.34 (2.25)
4	18	25	16	41	6.30 (3.28)
5	0	11	21	68	9.13 (2.75)
6	2	4	15	78	9.72 (2.72)
7	5	15	18	62	8.69 (3.39)
8	3	5	5	87	10.24 (2.70)
9-10	14	3	10	72	9.28 (3.87)
11-12	16	20	18	45	7.03 (3.99)
Total	9	11	15	65	8.59 (3.56)

# Current Study

- Analyzed the specific writing characteristics and text complexity of writing samples produced by students with SCD.
- Aimed to answer the following questions:
  - What are the specific characteristics of student writing at each DWS level?
  - How does student writing vary within and across grade bands?

# Materials

- The samples came for the regular administration of the Dynamic Learning Maps ELA assessment for an annual scoring review.
- Identified 141 writing samples representing the letter, word, and text production stages from the set used in Schuster et al. (2021) through stratified random sampling.

# Materials

- Developed a protocol based on both the DWS and text complexity literature to assess the writing samples on the critical components of text complexity represented at each level.
- Some items require counts of some components (e.g., number of words), while other items ask for the frequency.
  - How are the intelligible words spelled?
    - Mostly correct, some correct (~50%), or mostly incorrect

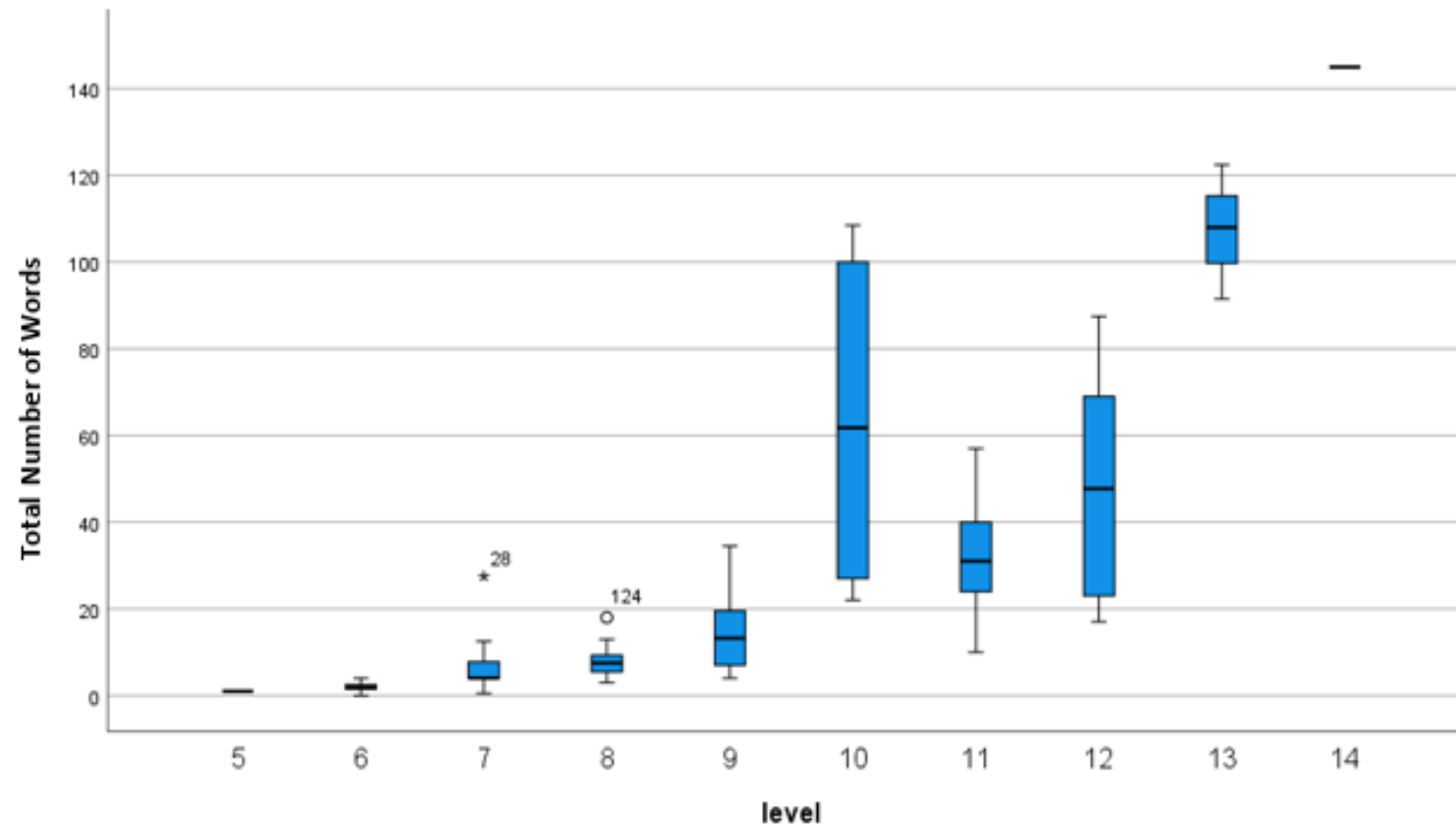


# Procedure

- Training helped the four independent raters reach consensus on the use of the protocol with four writing samples that represent different DWS levels.
- Two raters evaluated each of the 141 writing samples using the protocol.
- A third rater attempted to resolve any discrepancies.

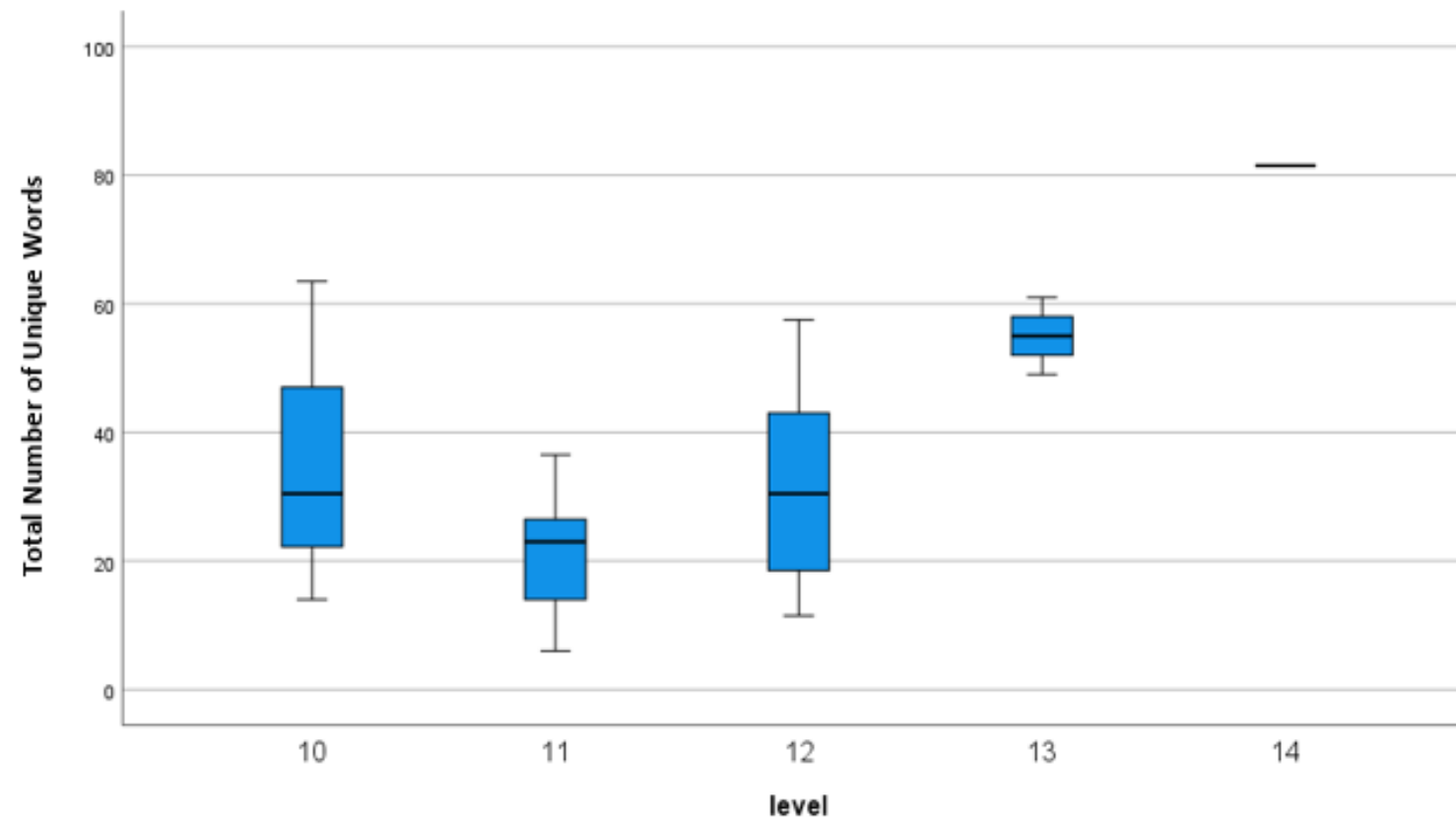
# Characteristics of Student Writing per DWS Level

Total Number of Words across Student Writing Samples by DWS Level



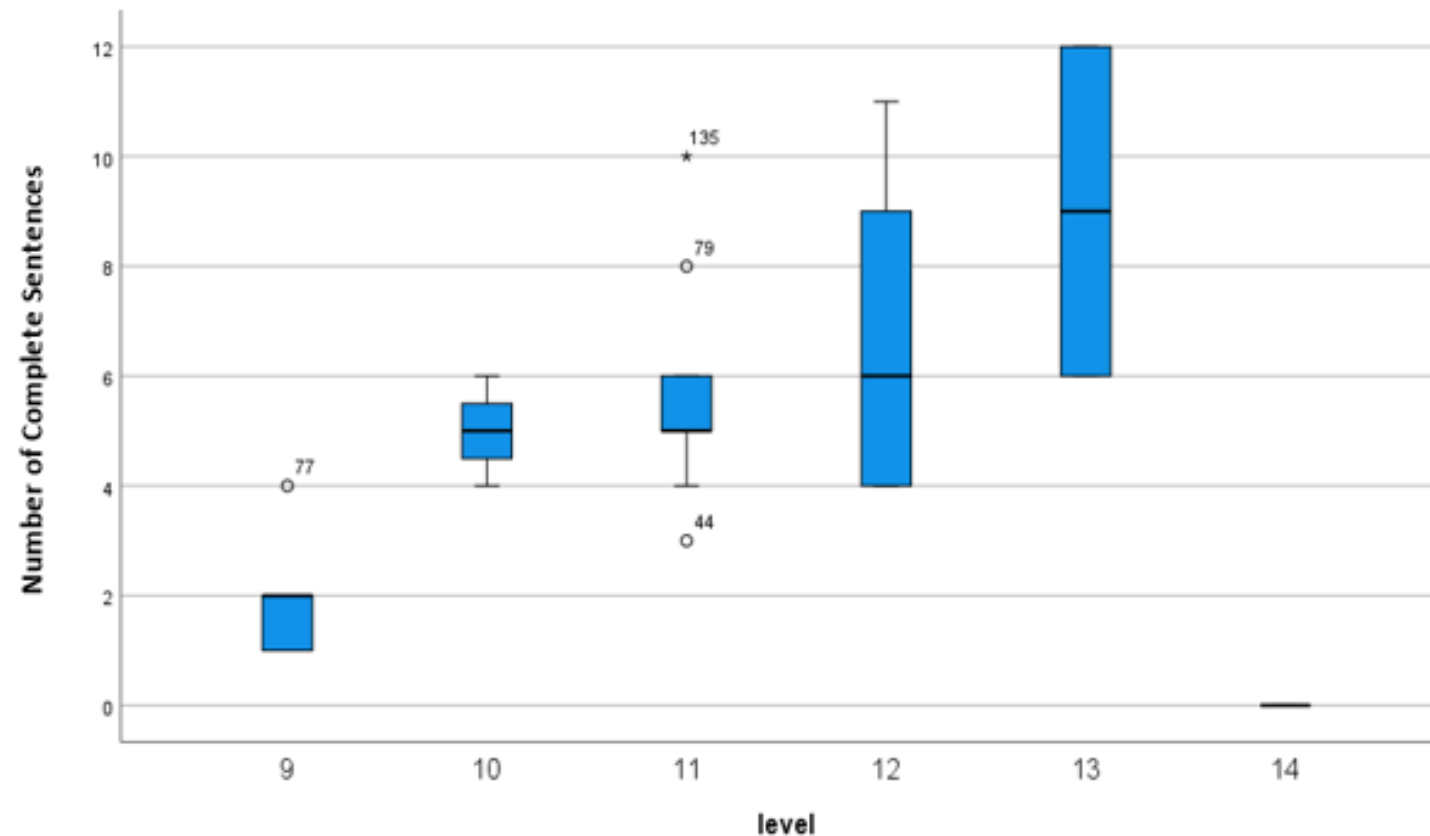
# Characteristics of Student Writing per DWS Level

Total Number of Unique Words across Student Writing Samples by DWS Level



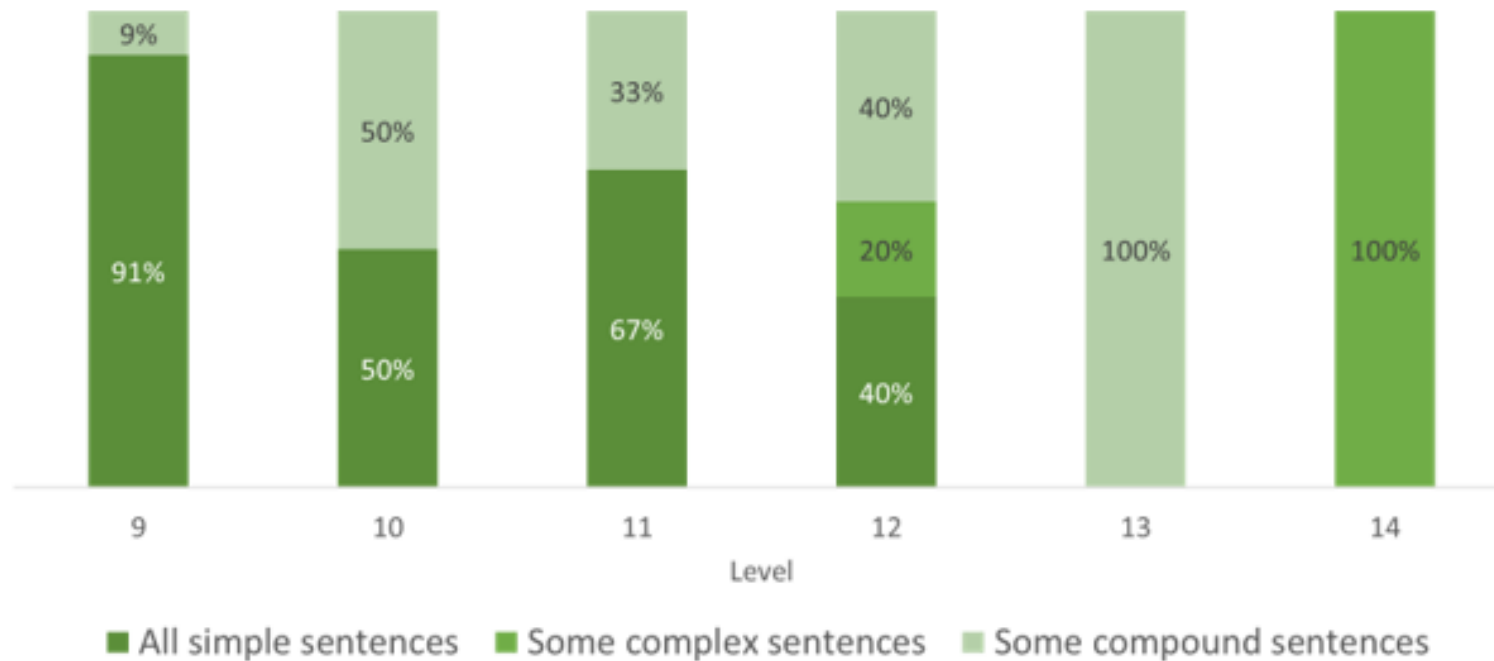
# Characteristics of Student Writing per DWS Level

Total Number of Complete Sentences across Student Writing Samples by DWS Level



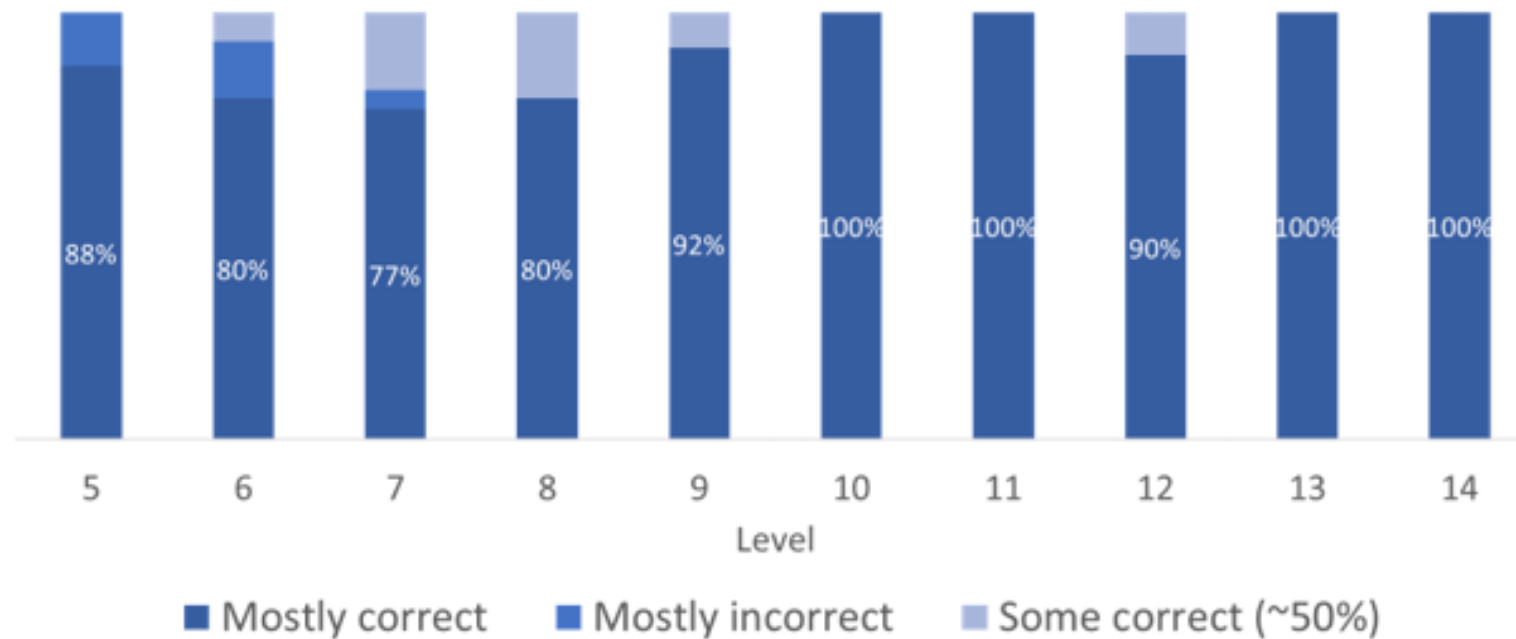
# Characteristics of Student Writing per DWS Level

*Frequency of Student Writing Samples with Different Types of Sentences Within and Across DWS Levels*



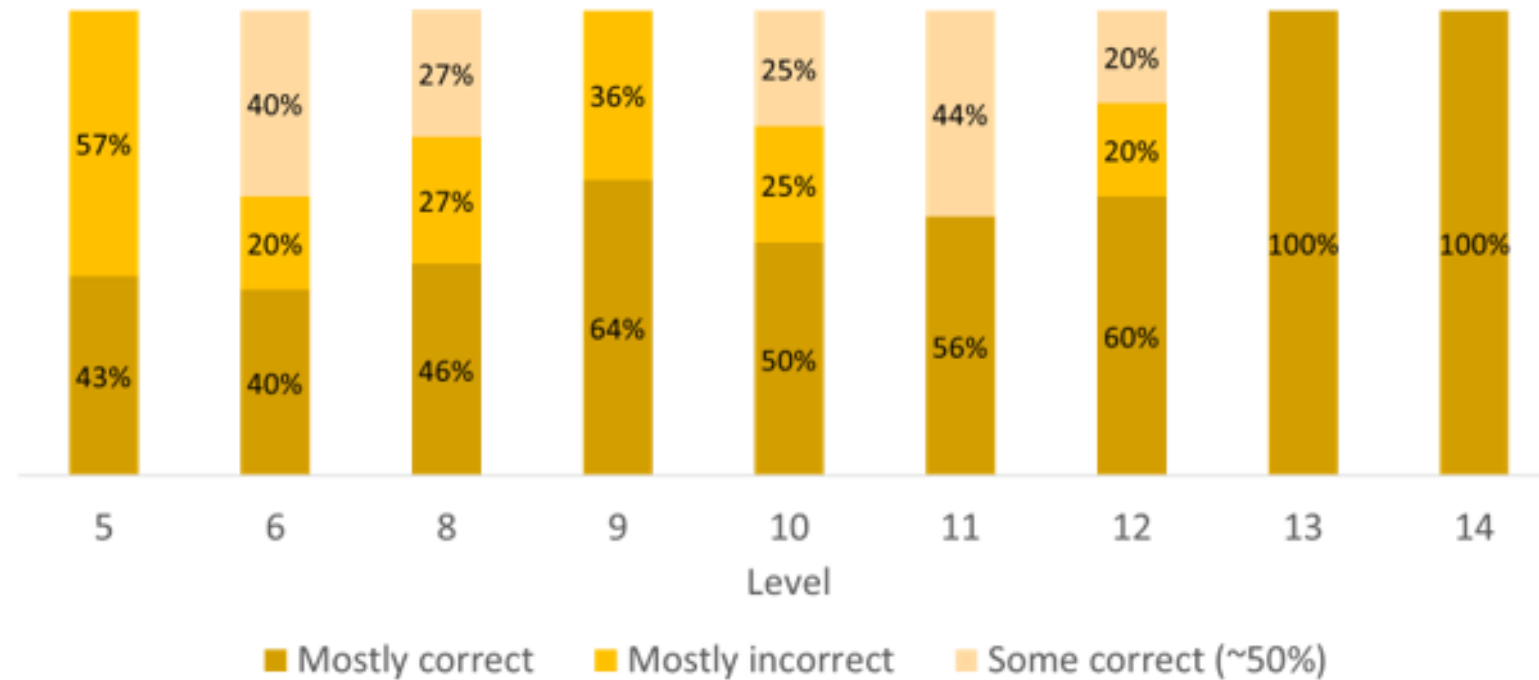
# Characteristics of Student Writing per DWS Level

*Frequency of Student Writing Samples with Different Degrees of Spelling Within and Across DWS Levels*



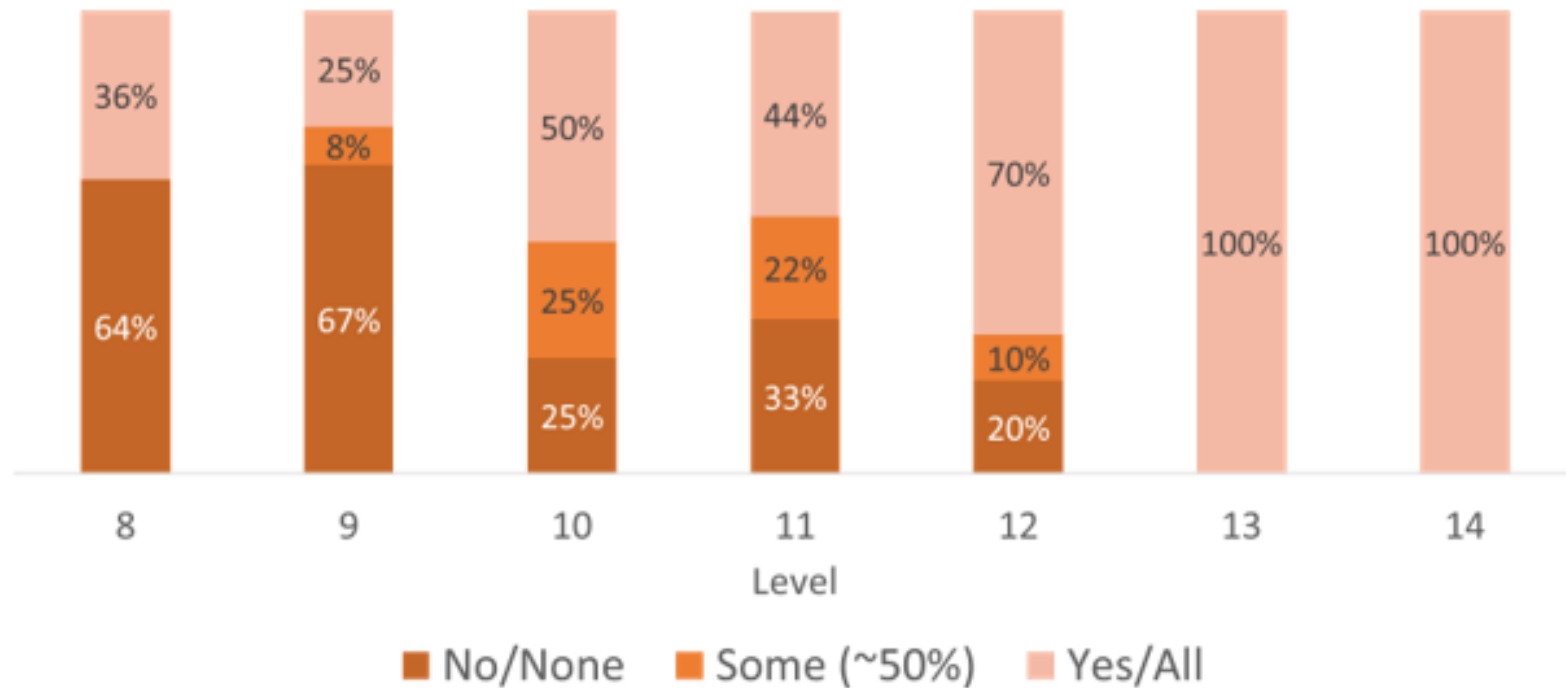
# Characteristics of Student Writing per DWS Level

*Frequency of Student Writing Samples with Different Degrees of Capitalization Usage Within and Across DWS Levels*



# Characteristics of Student Writing per DWS Level

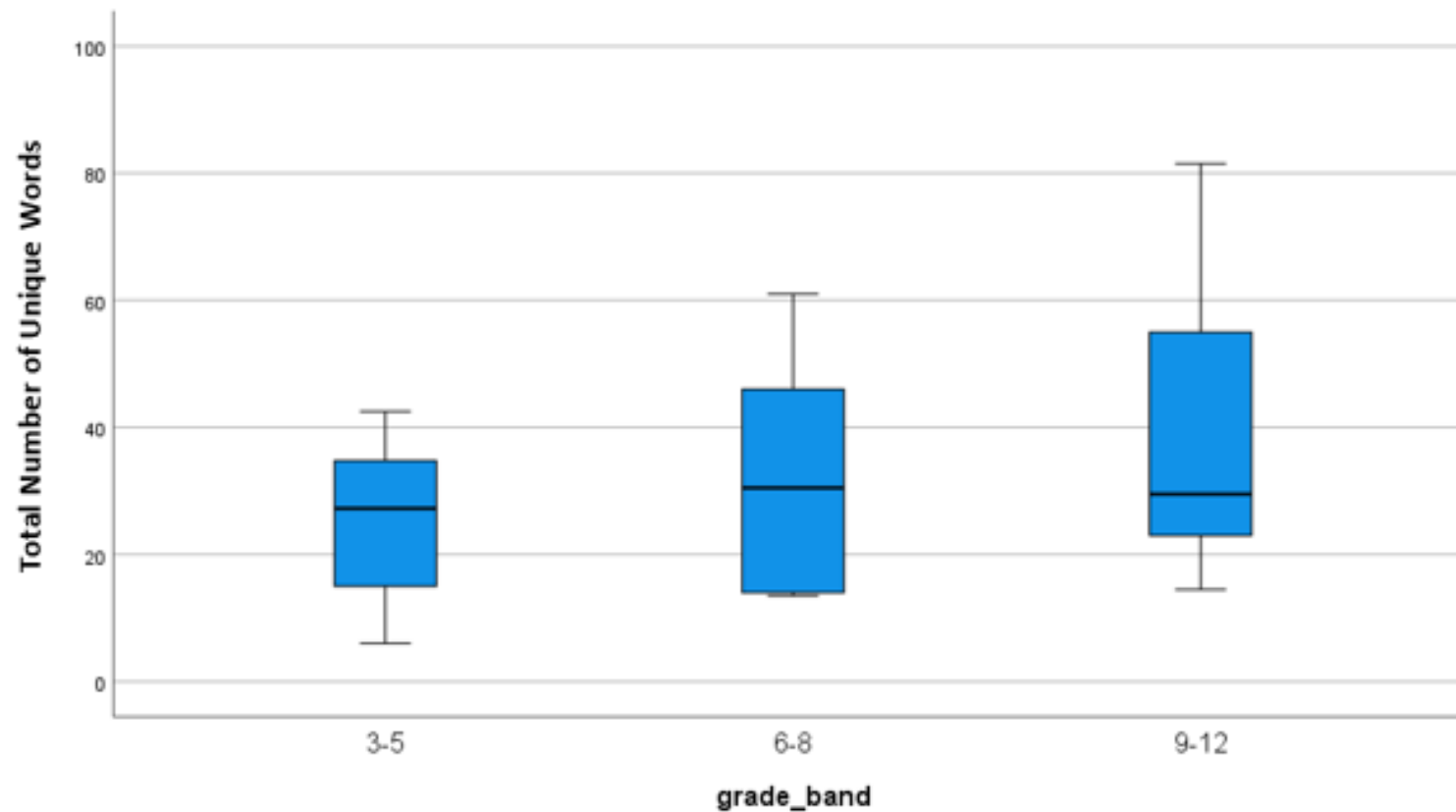
*Frequency of Student Writing Samples with Different Degree of End Punctuation Usage Within and Across DWS Level*





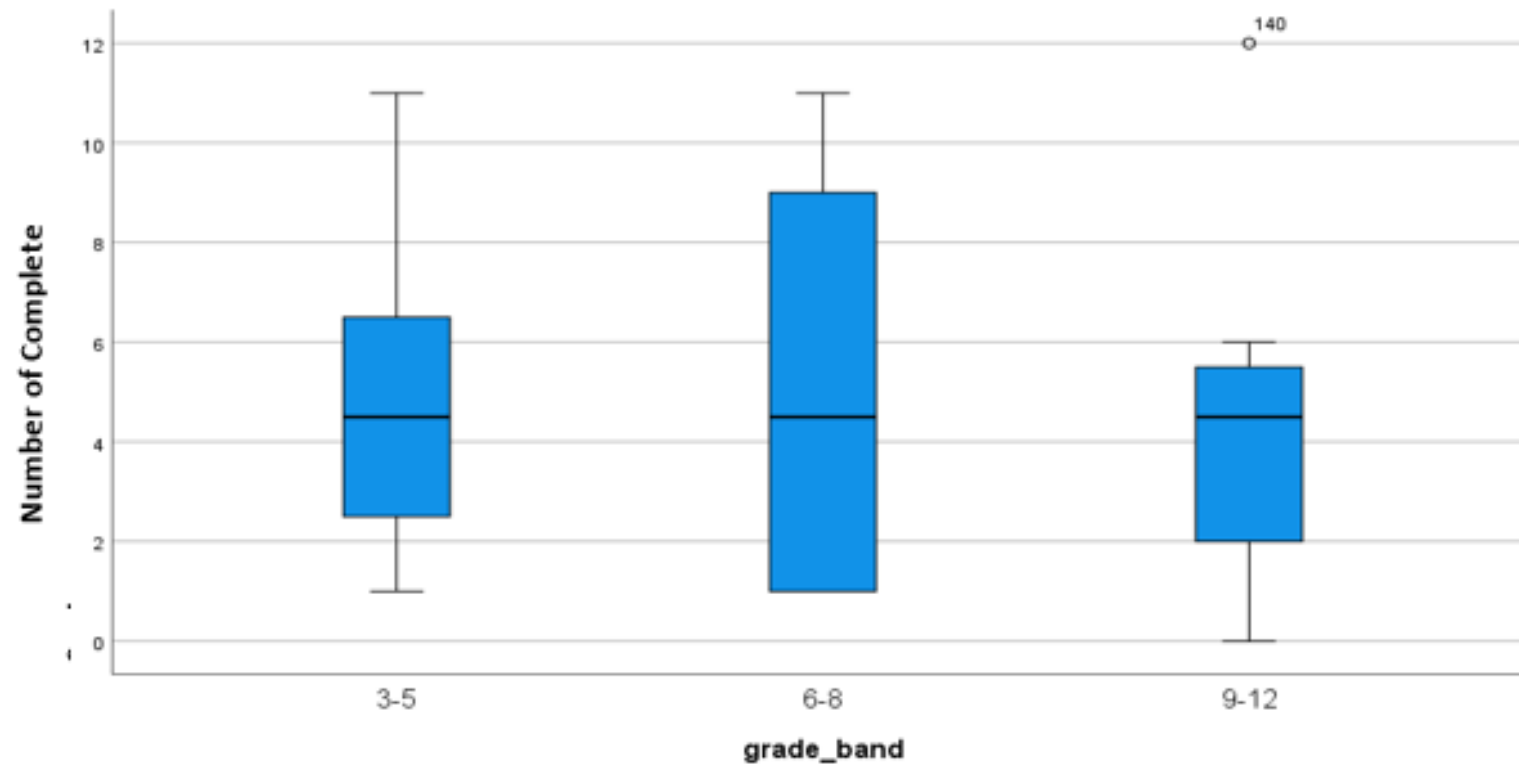
# Variability in Student Writing Within and Across Grades

*Total Number of Unique Words across Student Writing Samples by Grade Band*



# Variability in Student Writing Within and Across Grades

*Total Number of Complete Sentences across Student Writing Samples by Grade Band*



# Key Findings

- The conventional writing samples increased in complexity across DWS levels.
- They also demonstrated high variability in text complexity within and across grade bands.
- The DWS reflects gradual differences in text complexity for students with SCD.

# Limitations and Future Directions

- Conduct a more detailed analysis of the conventional writing samples of these students
  - Percentage of correctly spelled words
  - Counts of different sentence types and features
- Evaluate the emergent writing samples produced by students with SCD

# Conclusions

- First study to evaluate a broad collection of writing samples produced by students with SCD.
- The findings present an initial understanding of the conventional writing characteristics of these students.
- This understanding can help guide writing instruction and assessment while accounting for their diverse writing abilities.

# Thank you!

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