Microstructure and Macrostructure Measures of Written Narrative and Persuasive Language Samples in Fifth Grade Students

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Rationale

Speech-language pathologists' (SLPs') knowledge of how syntax, morphology, phonology, semantics, pragmatics, and metalinguistics relate to spoken and written language underscores their crucial role in the prevention, identification, diagnosis, and assessment of written language disorders. In schools, SLPs' roles should extend beyond exclusively working with individuals with communication disorders to include collaborating with other professionals to address the linguistic and metalinguistic underpinnings of literacy development in students at risk for academic difficulties (ASHA, 2010).

The Common Core State Standards (CCSS) *English Language Arts & Literacy* standards explicitly acknowledge the interconnections among reading, writing, speaking, and listening and highlight the need for interdisciplinary approaches to literacy (NGA, 2010, p.4).

Measures used by SLPs to evaluate narratives correlate with measures of writing used by teachers, such as the 6 Traits Writing Rubric (Education Northwest, 2014; Koutsoftas & Gray, 2012). Measures of microstructure and macrostructure load on different factors when assessed for narrative writing (Hall-Mills & Apel 2015).

Few studies have assessed the factor structure of persuasive writing, or the relation between SLPs' and teachers' measures of assessment of persuasive writing.

Research Questions

1. Do measures of microstructure and macrostructure of writing constitute separate factors?
2. Do measures of writing commonly used by SLPs predict scores on a holistic rubric frequently used by teachers?
3. Do fictional stories (FS, n=31), personal narratives (PN, n=25), historical retells (HR, n=18), and persuasive samples (PS, n=27) differ in their microstructure and macrostructure scores?

Methods-Corpus

Fifth grade written language samples (n=101)
- Narrative (n=74)
  - Fictional stories (n=31)
  - Personal narratives (n=25)
  - Historical retells (n=18)
- Persuasive (n=27)

Methods-Microstructure Analysis

Systematic Analysis of Language Transcripts (SALT; Miller et al., 2016))
- Mean length of utterance in words (MLUw)
- Number of total words (NTW)
- Number of different words (NDW)
- Subordination index (SI)

Methods-Macrostructure Analysis

6 Trait Writing Model of Instruction and Assessment (Education Northwest, 2014)
- Ideas/content
- Organization
- Voice
- Word choice
- Sentence fluency
- Conventions
- Total

Narrative Scoring Scheme (fictional stories, personal narratives, historical retells; Miller et al., 2016).
- Introduction
- Character development
- Mental states
- Conflict resolution
- Cohesion
- Conclusion
- Total

Persuasive Scoring Scheme (persuasive samples, Miller et al., 2016)
- Issue identification and desired change
- Supporting reasons
- Other point of view/counter arguments
- Compromises
- Conclusion
- Cohesion
- Effectiveness
- Total

Results-Narrative

Table 1. Principal component analysis for narrative

Variable	Story grammar	Traits	Semantics	Morphosyntax
MLUw				.85
NTW			.91	
NDW			.79	
SI				.84
Introduction	.85			
Character Development	.90			
Mental States	.82			
Referencing	.78			
Conflict/Resolution	.86			
Cohesion	.82			
NSS Total	.94			
Ideas		.80		
Organization		.86		
Voice		.82		
Word Choice		.84		
Sentence Fluency		.87		
Conventions		.86		
Traits Total		.94		

Table 2. Predictors of 6 Trait score for narrative

Predictor Block 2	R^2 Block 1	$R^2 \Delta$ Block 3	β Block 3 Predictor
NSS Total	.34	.10	.38*
NTW	.41	.03	.22*
MLUw	.39	.05	.26*

$F(3,69)=18.39$, $R=.67$, $R^2=.44$, $p<.001$

Results- Persuasive

Table 3. Principal component analysis for persuasive

Variable	Macro-structure	Perspective-taking	Semantics	Morpho-syntax
MLUw				.80
NTW			.88	
NDW			.87	
SI				.89
Issue ID	.64			
Support	.87			
Counterarguments		.76		
Compromises		.81		
Conclusion	.70			
Cohesion	.87			
Effectiveness	.80			
PSS Total	.77			
Ideas	.83			
Organization	.82			
Voice	.85			
Word Choice	.83			
Sentence Fluency	.80			
Conventions	.83			
Traits Total	.84			

Table 4. Predictors of 6 Trait score for persuasive

Predictor Block 2	R^2 Block 1	$R^2 \Delta$ Block 3	β Block 3 Predictor
Compromises	.60	<.01	-.07
NTW	.39	.21	.53*
SI	.42	.18	.45*

$F(3,23)=11.51$ $R=.78$, $R^2=.60$, $p<.001$

Results-MANOVA

- Significant differences by genre for MLUw, NTW, NDW, and SI, but not for any Trait scores.

- Significantly higher MLUw and SI on the persuasive samples than each of the narrative types

- Significantly higher NTW on fictional stories than each other genre

- Significantly higher NDW on fictional stories than historical retells or persuasive samples

Conclusion

- Macrostructure and microstructure measures comprise separate factors in both narrative and persuasive writing

- Morphosyntax and semantics scores predict scores on the 6 Trait rubric, often used by teaches to assess writing for both narrative and persuasive samples

- For the narrative samples, scores on the narrative scoring scheme predicted 10% of unique variance in 6 Trait scores, beyond that accounted for by morphosyntax and semantics

- For persuasive samples, the two factors in the persuasive scoring scheme that require taking others' perspectives loaded on a separate factor from the other components of the persuasive scoring scheme

- For the persuasive samples, the 6 traits loaded on the same factor as the components of the persuasive scoring scheme, except for the measures requiring taking others' perspectives

- Perspective-taking did not account for unique variance in 6 Trait scores on the persuasive samples

- Persuasive samples yielded the highest morphosyntax scores

- Fictional stories yielded the highest semantics scores

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Conflict of Interest Statement

Courtney Karasinski, Alexis Ammon, Megan Bierer, and Madeline Smith have no conflicts of interest to report.

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