

INTRODUCTION

- Wordless books are often used to elicit children's fictional narrative production as part of SL-P language assessment and research (e.g. Schneider et al., 2005). A number of linguistic features of interest can be analyzed from these language samples to establish baseline, monitor progress over time, or track development (Heilmann et al., 2020).
- Analysis that examines children's microstructure (e.g., MLUm, TTR), inferencing, and features of literate language in the stories they tell requires orthographic transcription and coding.
- This methodology, whether it is conducted manually by clinicians in real time or by researchers for large samples, is laborious and time-consuming.
- Studies have explored the use of alternate technologies, such as direct video coding, but accessibility (e.g., cost, ease of use) and reliability continue to play a part in adopting these methods (Levickus et al., 2018).
- Another consideration would be to examine different tasks (i.e., story generation, story retell, story starter) to determine whether these elicit different features of interest to inform the selection of one task over another. For example, if a story starter (i.e., a single picture) yields shorter stories does it include representation of a broad range of features of interest?
- The current study investigated whether a story-starter yielded comparable results in analysis in language features.

RESEARCH QUESTIONS

Compared to narrative retell and generation,

- How does a story-starter compare in language microstructure?
- How does a story-starter compare in features of literate language?
- How does a story-starter compare in inferential thinking across four levels and weighted averages?

METHOD

PARTICIPANTS

This secondary analysis combining data across two studies includes 268 children (Mean age = 54.7 months; $SD = 5.52$; 131 males) with typically-developing language.

Trained research assistants met with each child individually to administer three fictional narrative tasks:

- Story Generation: Edmonton Narrative Norms Instrument (ENNI; Schneider et al., 2005).
- Story Retell: "Frog, Where Are You?" (FWAY; Mayer, 1969).
- Story-starter (Generation): centrefold image from One Frog Too Many (OFTM; Mayer, 1969)



TRANSCRIPTION & CODING

All stories were audio-recorded, transcribed, and coded by trained independent observers to transcription and coding criterion using Systematic Analysis of Language Transcripts (SALT; Miller & Iglesias, 2012). Inter-rater agreement for 20% of all transcripts was 90%.

Three sets of data were generated to address the questions of this study using SALT:

- Features of microstructure (i.e., MLUm, TTR, Story Length in C-Units, ...)
- Features of literate language were applied to each occurrence of eight codes that align with the use of literate or more specified language (Curenton & Justice, 2004):

Simple & Complex Elaborated Noun Phrases	[SEN] [CEN]
Linguistic & Mental State Verbs	[LV] [MSV]
Coordinating & Subordinating Conjunctions	[CCN] [SCN]
Adverbs	[ADV]
Tier Two Vocabulary	[T2]

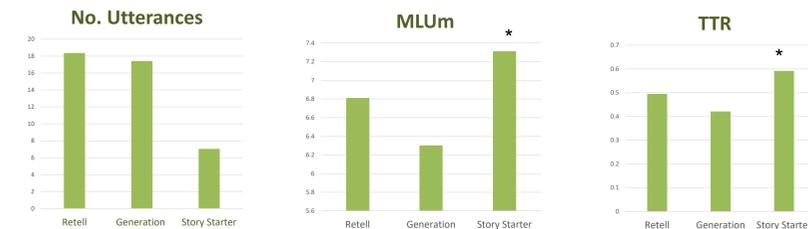
Inter-rater reliability (20%) using Fleiss' kappa for these codes was strong (i.e., .769).

- Levels of abstraction (Blank, Rose, & Berlin, 1978) – one of four codes was applied to each C-unit exhaustively to identify children's use of inferencing in their stories from literal labeling statements (Level 1; e.g., "airplane", "elephant") to abstract statements (Level 4; e.g., "He is sad because he will never get his airplane back."). Inter-rater agreement for transcripts was good (i.e., .532). There were no issues of fidelity.

RESULTS

Repeated-measures ANOVA controlling for multiple comparisons:

Q1. MICROSTRUCTURE



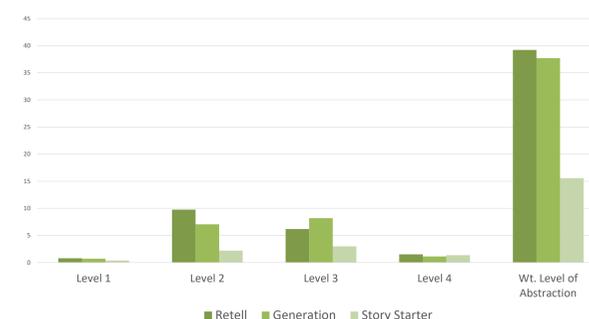
- Retell ($M=18.4$) and generation ($M=17.4$) similar in mean length of C-units. Both > story-starter ($M=7.3$), $F(1.86, 384.4)=18.3$, $p<.001$ at a moderate effect size.
- Significant difference in MLUm, $F(1.86, 384.4)=18.30$, $p<.001$, story starter > both retell and generation.
- Significant difference in Type-Token-Ratio, $F(2, 414) = 28.21^{***}$ at a large effect size story starter > both retell and generation (i.e., higher in number of total words and number of different words at rate per minute).

Q2. FEATURES OF LITERATE LANGUAGE



- Significant differences across task in the rate per minute of complex elaborated noun phrases, $F(1.46, 301.21) = 30.05^{***}$ at a large effect size, with story starter > retell and generation.
- Significant differences across tasks in children's use of mental state verbs, $F(1.34, 276.90) = 4.39^*$ with story starter > retell but not generation.
- Significant difference in rate per minute of subordinate clauses, $F(1.71, 354.70) = 7.045^*$, with story starter > generation but not retell.
- No significant difference across tasks in Tier 2 words at rate per minute.

Q3. INFERENCING



- Level 1, 2, and 3 - both retell and generation > story starter.
- Level 4 was not significantly different.
- Significant difference across tasks in weighted level of abstraction, $F(2, 534) = 174.94^{***}$; $\eta^2 = .396$ with both retell and generation > story starter.

DISCUSSION

FINDINGS

- Story-starters may provide clinicians and researchers with fewer exemplars of linguistic errors based on the significantly shorter stories told by children; however, these findings indicate promising uses for story-starters in clinical practice and research, depending on the features of interest.
- Story generation using a single picture may not constrain children to the modelled story as in retell nor appear to be as difficult as telling a story using pictures telling a whole story as indicated by the longer utterances and higher TTR.
- Stories told using story starters contain all of the features of literate language and at a higher rate per minute for elaborate noun phrases, mental state verbs, and clausal density but not higher vocabulary.
- Interestingly, stories told with story starters include lower levels of inferencing than both retell and generation tasks involving pictures supporting a full story.
- It is expected that the language of children's narrative storytelling contains more complex language than is spoken in everyday language by children, such as, more frequent use of complex noun phrases (van Kleeck, 2014). These findings indicate that the context of the task results in different linguistic features.

LIMITATIONS

- This re-analysis of data from two studies did not have common standardized measures describing the language abilities of the children. A larger sample was important to us to describe differences between microstructure, literate language, and inferencing in the language sample analyses of the three narrative production tasks in this secondary analysis.
- Inter-rater reliability of the features of literate language and levels of abstraction were not high, limiting the ability to draw significant conclusions.
- The stories used in story generation and retell tasks were matched on the number of pictures in the wordless picture books. Future studies could examine whether matching on the number of episodes would result in significant differences between these two narrative production tasks.

IMPLICATIONS

- Clinicians may consider using story starters to reduce the work to transcribe and code long fictional narrative samples for use in establishing baseline and monitoring children's progress over time; however, there are some considerations in making this decision.
- Research is needed to examine the elements of children's fictional narratives that contain inferencing that differ across tasks and features of literate language that occur at significantly higher rates using story starters.
- Story starters using rate-per-minute may be a reliable addition to SL-P screening and progress monitoring. Clinical research for the use of story-starters is warranted.

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For more information about the coding systems used in this study, scan this QR code to view supplemental information.



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