Story Grammar Analysis in Persons with Mild Aphasia
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Background
• Narratives are often the basis of daily conversational interactions. When narrative skills are compromised, functional conversation is negatively impacted.
• Narrative coherence can be impacted in persons with anomic aphasia (PWAAs).1
• Narrative abilities of individuals who have had a stroke (and perhaps previous aphasia diagnosis) but who perform within normal limits on standardized aphasia assessment measures (e.g., “not aphasic by WAB” or “NABWW”) have not been characterized.
• In order to continue progressive development of interventions for PWAAs and NABWs, more information regarding narrative strengths and weaknesses is needed.
  • These individuals have little to no therapeutic options, but still have difficulty in conversation, may not be able to return to work, and may demonstrate reduced life participation.
• Story grammar analysis is a well-known and commonly used narrative analysis method.
   • Aim 1: To determine if there are differences between PWAAs, NABWs, and non-brain-injured controls (NBIs) on production of story grammar components during telling of the Cinderella story.
   • Aim 2: To examine the relationship between story grammar measures and an easily and quickly derived discourse measure called CoreLex.

Methods
Database
• Thirty Cinderella story transcripts (10 per group) were retrieved from the AphasiaBank2 database, matched for gender, race/ethnicity, age, years of education, and handedness. See Table 1.

Table 1: PWaA, NABW, NBI

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setting</td>
<td>Habitual or static states of characters and locations.</td>
</tr>
<tr>
<td>Initiating Events</td>
<td>The immediate cause for a response on the part of the protagonist.</td>
</tr>
<tr>
<td>Response</td>
<td>The psychological state of the character after the initiating event or a verbal response to the situation.</td>
</tr>
<tr>
<td>Plan</td>
<td>Statements that specify a character’s strategy for obtaining the goal.</td>
</tr>
<tr>
<td>Attempt</td>
<td>The character’s overt action(s) to obtain the goal.</td>
</tr>
<tr>
<td>Consequence</td>
<td>The character’s success or failure at attaining the goal(s); any changes in the sequence of events resulting from the character’s actions.</td>
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</tbody>
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Story Grammar Coding
• Transcripts were divided into relevant concepts (RCs) (i.e., utterances about what a character said, one main verb, and object).
  • May contain subordinate clauses, but must contain ONLY ONE MAIN verb.1
• RCs received a story grammar code.3 See Table 2.
• The following were calculated:
  • Story Length = total number of RCs that received a story grammar code
  • Story Component Usage = frequency of use of seven different story components
  • Core Lexion (CoreLex)= the total number of words spoken in the transcript that have been identified in previous research as the core lexems spoken by 50% of AphasiaBank control participants (e.g., Cinderella, prince, clean, wand, etc.)

Data Analysis
• Aim 1: Wilcoxon Signed-Rank Tests (two-tailed)
• Aim 2: Spearman’s Rank Order Correlation (rho) (two-tailed)

Table 2: Story Grammar Components.

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References
5. Richardson, J.D., Hudspeth, S.I., & Dillow, E.D. (in prep). Does use of a core lexicon predict narrative adequacy as measured by main concept production?

Results
• NBIs had the numerically highest values for all story grammar variables.
• NBIs were significantly different from NABWs for Story Length (z=-2.395, p=0.017), “Setting” (z=-2.144, p=0.032), “Response” (z=-2.209, p=0.035), “Direct Consequence” (z=-2.145, p=0.032), and “Reaction” (z=-2.810, p=0.005).
• NABWs were significantly different from PWaAs for Story Length (z=-2.091, p=0.037), “Attempt” (z=-2.322, p=0.020), and “Reaction” (z=-2.539, p=0.011).
• The only significant difference observed between PWaAs and NABWs was for the story component “Reaction”, z=-2.280, p=0.023.
• Spearman rho results for CoreLex – Story Length relationships are as follows: NBI, r(8) = .967, p=0.043; and identical results for NABI and PWaA, r(8) = .784, p=0.004.

Discussion
• Communication deficits were not captured by WAB-R AQ scores in our PWaAs and NABWs, as all were performing at or near ceiling.
• Story grammar analysis revealed significant differences between NBIs, NABWs, and PWaAs in this study.
• Reduced story components (and thus length) likely results in reduced story coherence in NABWs and PWaAs.
• NABWs have a profile more similar to PWaAs than NBIs.
• Word-finding deficits may contribute to reduced usage of story components (microlinguistic deficits contributing to macrolinguistic deficits1).
• The correlation between story length and CoreLex is greater in PWaAs and NABWs than NBIs, and one interpretation is that reduced vocabulary drives the reduced story in these individuals.
• Traditional word retrieval therapy (e.g., naming) is unlikely to result in improved narrative performance in these populations. Word-finding in narrative and conversation would be most beneficial.
• Story grammar and other discourse analyses consistently reveal marked differences between PWaAs and controls, even when treatment has been suspended because of high levels of performance.
• Narrative discourse, and not traditional assessment measures, may be a better candidate for decision-making regarding treatment termination, more consistent with the shifting focus to life participation and quality of life as treatment outcomes.

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