Introduction

It has long been recognized that people who stutter exhibit fluency variations across speaking tasks and over time. Recently, clinicians have examined the extent to which variability exists within individual speech samples and whether such variability might impact clinical decision-making (Logan & Hig Tas, in press).

Sawyer and Yairi (2006) found that children produced more stutter-like disfluency in the first 300 syllables of 1200-syllable samples than they did in the first 300 syllables. They hypothesized that the fluency variations resulted from changes in the child’s comfort levels during sampling, which in turn led the children to use more, complex (and, hence, less fluent) utterances toward the end of samples.

One way to examine Sawyer and Yairi’s (2006) hypothesis would be to analyze complexity metrics at various points within a child’s speech sample (e.g., # of syllables, words, or clauses per utterance).

Another way to examine Sawyer and Yairi’s (2004) hypothesis would be to analyze the pragmatic functions of utterances at various points within a child’s speech sample (e.g., frequency of assertive and responsive speech acts).

It may be that children do not, per se, feel “more comfortable,” but rather that the nature of parent-child interactions change over time. In this view, parent-child pragmatics may influence the types of utterances that children use during various periods of a speech sample.

Purpose: In the present study, we examined variations in children’s fluency relative to measures of utterance length and complexity as well as the types of speech acts that children used.

Results should identify linguistic sources of within-sample fluency variation for children, and thus suggest ways to improve the efficiency and validity of speech sampling activities.

Questions

Do children who stutter produce more disfluency during some segments of a speech sample than others? If so...

Do “high fluency” segments of a speech sample differ from “low fluency” segments of a speech sample in terms of the length or complexity of utterances that children produce within them?

Do “high fluency” speech samples differ more often in utterances containing relatively many clauses, words, and syllables?

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Participants

27 children who stutter (CWS).

23 males, 4 females

Mean age = 4 years; 8 months (SD = 15 months)

All spoke English with native competence.

None were enrolled in fluency therapy.

Data Collection

CWs conversed with one or both parents for ~ 30 min.

Play-based setting with age-appropriate toys.

Audio/video recordings were made for all samples.

Data Analysis

An assistant prepared initial glosses of the conversations on utterance-by-utterance basis.

Another assistant reviewed initial glosses to correct errors and oversights.

One of the researchers reviewed the glosses again to correct errors and oversights, and to resolve discrepancies.

Fluency Analysis

Disfluent segments were coded.

Repetitions/Prolongations (RPs): repeated speech (i.e., sounds, syllables, parts of words, whole words, multiple words) or prolongations of speech sounds and their associated postures.

Other disfluency types (i.e., interjections, revisions) were included in the transcripts, but not analyzed for this study.

Syllables in fluent stretches of speech were counted. Word counts were divided into RP counts to compute “RPs per 106 syllables of speech.”

Sample Segmentation

Resultant samples were parsed into 200-syllable subsamples.

Linguistic Analyses

Speech act analysis (after Fay, 1986).

Assertive acts: utterances not overtly solicited by parent (e.g., comments, statements, requests).

Responsive acts: utterances that complied with parent’s requests (e.g., responses to requests for information) or utterances that acknowledged parent’s utterances.

Syntactic analysis: number of words and clauses per utterance.

Results and Discussion

Overall Sample Characteristics

Table 1. Summary statistics for linguistic characteristics of speech samples. (N = 27)

<table>
<thead>
<tr>
<th></th>
<th>Utterances</th>
<th>Syllables</th>
<th>Words</th>
<th>Clauses</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>143</td>
<td>593</td>
<td>481</td>
<td>82</td>
</tr>
<tr>
<td>SD</td>
<td>72</td>
<td>285</td>
<td>226</td>
<td>50</td>
</tr>
</tbody>
</table>

Figure 1. Children produced more assertive speech acts than responsive speech acts (K27 = 3.52, p < .001). The pattern was observed in 19 of 27 children.

Table 1. RPs per 100 syllables across 400- syllable segments within the speech samples.

Speech Sample Segment

<table>
<thead>
<tr>
<th>RPs per Segment</th>
<th>0 to 200</th>
<th>201 to 400</th>
<th>401 to 600</th>
<th>601 to 800</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>6.46</td>
<td>8.22</td>
<td>7.37</td>
<td>8.63</td>
</tr>
<tr>
<td>S.E.</td>
<td>0.99</td>
<td>1.44</td>
<td>0.93</td>
<td>1.33</td>
</tr>
</tbody>
</table>

Figure 4. Utterances containing Repetitions and/or Prolongations (RPs) had significantly more clauses, words, and syllables than utterances that were spoken fluently.

Fluency variations within speech samples

Table 2. Number of clauses, words, and syllables per utterance in 200-syllable sample segments containing most and least RP disfluency.

<table>
<thead>
<tr>
<th>Segment Type</th>
<th>Sample Segment</th>
<th>Most fluent</th>
<th>Least Disfluent</th>
<th>t(df)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clauses</td>
<td>5.75</td>
<td>0.7</td>
<td>1.45</td>
<td>18</td>
<td>0.2</td>
</tr>
<tr>
<td>Words</td>
<td>4.04</td>
<td>3.82</td>
<td>1.50</td>
<td>18</td>
<td>0.2</td>
</tr>
<tr>
<td>Syllables</td>
<td>4.77</td>
<td>4.53</td>
<td>1.16</td>
<td>18</td>
<td>0.3</td>
</tr>
</tbody>
</table>

Figure 3. The difference in Repetitions and Prolongation frequencies between assertive and responsive utterances approached significance (K27 = 1.94, p = .06).

Conclusions

• Repetitions and prolongations are produced more often in utterances containing relatively many clauses, words, and syllables.

• Results do not support the idea that later segments of a speech sample contain more disfluency than earlier segments.

• Children produced more assertive acts than responsive acts, suggesting that most parents were not highly directive in these clinical interactions.

• Assertive utterances were more complex than responsive utterances. Accordingly there was a trend toward responsive utterances being spoken with greater fluency than assertive utterances. Parent requests seemed to facilitate fluency in most cases.

• The most and least disfluent segments within speech samples were not markedly different in linguistic demands. Thus, other factors (e.g., conversational pace?) must affect children’s speech fluency.

• Elucidation of a range of utterance complexity types seems more important than elicitation of long speech samples if clinician wish to elicit a range of fluency behaviors.

References
