

All in Good Time: A Preliminary Study of Parent-Child Turn Taking in Early Stuttering

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1. Background

Many professional and self-help organizations (e.g., ASHA and SFA) present advice to lengthen time between child and parent speaking turns to improve fluency in the child who stutters (CWS). A small body of previous research provides limited support for this advice: Structured turn-taking during parent-CWS interactions seems to decrease the number of disfluencies produced by the child who stutters (e.g., Winslow & Guitar, 1994). In such cases, it is speculated that the decrease in disfluencies may be enabled by increased response time latency (RTL) between speaking turns. Prolonged response time latency may decrease the child's conversational pressure to respond (Kelly & Conture, 1992). However, the long-term effect of implementing this advice on recovery from stuttering has yet to be evaluated. We analyze whether parental response-time latency plays a role in recovery from stuttering in CWS by analyzing mother-child play interactions from the International Illinois Stuttering Research Project (IISRP) Corpus (Yairi & Ambrose, 2005).

If parental turn-taking plays a significant role in long-term facilitation of fluency, it is possible that minor differences might emerge between the turn-taking profiles of children who recovered from stuttering (CWS-R) and children who remained persistent (CWS-P). In contrast, if changes in parental turn-taking only facilitate short-term fluctuations in fluency, we would not expect to see any systematic differences between parental turn-taking with CWS-R and CWS-P. Thus, we assessed parent-child turn-taking in early stuttering in a large cohort of stuttering children, some of whom recovered, while others remained persistent.

In addition, we compared stuttering cohorts with an appropriately matched non-stuttering cohort (CWNS). Further, we were also able to analyze the effectiveness of response time latency as a counseling technique. This is because at the first recording session (baseline), parents were not given any advice on ways to help their child. However, at the conclusion of baseline, all parents were given the same, consistent advice to slow rate and increase turn-taking latency, as described in Yairi & Ambrose (2005).

2. Method

We analyzed first year (baseline) mother-child play interactions from the International Illinois Stuttering Research Project (IISRP) Corpus (Yairi & Ambrose, 2005; now publicly available at FluencyBank, www.fluency.talkbank.org). Previous studies suggest there may be a difference in paternal and maternal communication, so we opted to only examine mother-child interactions (Berko Gleason, 1975). As noted, these were baseline interactions prior to any parent counseling or instruction.

2.1. Participants

The full database contains 440 samples from 88 children who stutter. These children were seen 5 times each, 6 months apart. All children's speech was transcribed and coded for fluency by the original researchers. Original codes were replaced to obtain compatibility with the CLAN FluCalc utility, which assesses more than three dozen fluency categories and parameters. Although only children's speech was originally transcribed, work is ongoing to augment files with transcription of the children's conversational partners. All files are in TalkBank CHAT format, with audio-linkage that enables PRAAT analysis.

Sample 1 of the IISRP data contains 80 files consisting of a mother-child play interaction. Thirty-nine were with children who recovered from stuttering (CWS-R), while fourteen of the files were interactions from children who remained persistent (CWS-P). Additionally, twenty-seven of the files were from children who did not stutter (CWNS).

2.2. Analysis Technique

Utilizing CLAN software, we re-bulleted the files to include the mother and child utterance in a single acoustic segment (called a bullet in the CLAN system). Once the utterances existed on a single bullet, we utilized the “send to sound analyzer” feature on CLAN to transfer the bullet to PRAAT. In PRAAT, we were able to segment the speech waveform and identify the response time latency, measured in seconds, between the child and mother utterance. Response time latency was measured in seconds; parent overlap/interruption was coded as negative response time latency.

Following acoustical analysis, we analyzed all child utterances in the sample for fluency; our major outcome variable was the weighted SLD (stuttering like disfluency) score, originally developed by the IISRP, used to determine the severity of stuttering. This formula multiplies the sum of part-word and whole-word repetitions by the mean of the observed repetition units in the sample; it then adds this value to twice the sum of prolongations and blocks (Bernstein Ratner et al., 2022). Weighted SLD was computed utilizing the FluCalc command as described above.

2.3. Statistical Analysis

Our first step was to determine whether CWS-P, CWS-R and CWNS differ in profiles of RTL at baseline. For each child, 20 child-mother adjacent utterances were analyzed to obtain RTL. Next, we employed a repeated measures ANOVA to ascertain whether the groups differed significantly on this variable.

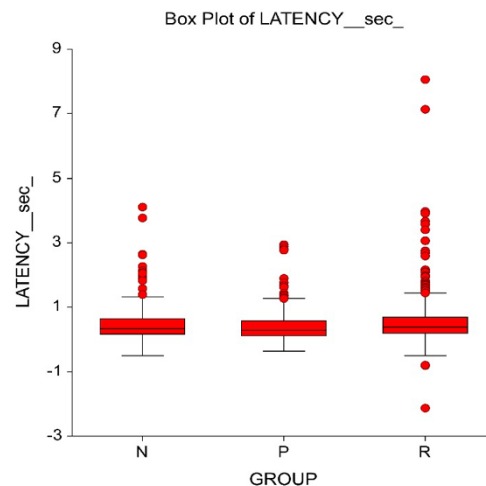
Our second step was to determine whether, for individual mother-child dyads, mean RTL has a relationship to weighted disfluency score. This was evaluated using linear regression.

3. Preliminary Findings

To date, we have completed analysis of 50% of Sample 1 data. Our analysis consisted of 28 files from CWS-R, and 13 files from interactions with CWS-P. In addition, 11 files from children who did not stutter were analyzed. From these 52 files, 1040 total data points were collected and analyzed statistically using ANOVA.

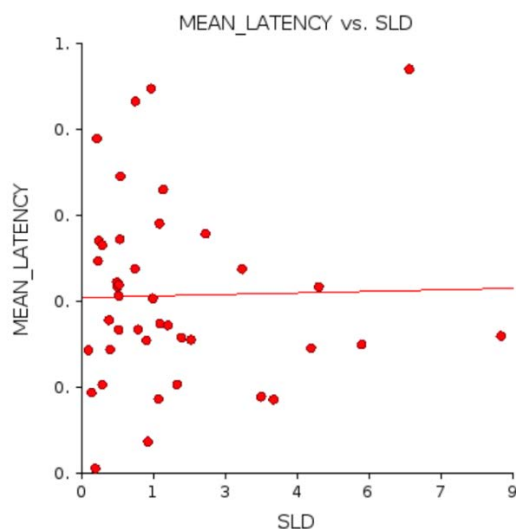
Preliminary findings show non-significantly longer parental RTL at baseline for children who recovered, as compared to those who became persistent. In the 20 turn-taking interactions analyzed for each mother-child dyad, parents of CWS-R used mean RTLs of .57 seconds, whereas parents of CWS-P used mean RTL times of .43 seconds. Additionally, parents of CWNS showed an intermediate profile, with mean RTL times of .52 seconds (See Figure 1). Although these findings were not statistically significant ($F = 1.86$, $df(2,47)$, $p = .20$, ns), the variability between RTL across individual parent-child interactions was highly statistically significant ($F = 2.05$, $df(2,47)$, $p = .00005$). This suggests marked differences across parent-child dyads in conversational tempo that combine to yield only slight differences among groups.

Figure 1. Mean Parental RTL in Seconds for Each Cohort



A linear regression was used to determine whether weighted SLD score was correlated with RTL in the completed files. The correlation between mean latency and weighted SLD was 0.0207 (See Figure 2). No significant correlation was observed ($R^2 = .0004$, $p = .899$, ns). This preliminary finding suggests that length of parents' time between speaking turns may not have a facilitating effect on their child's fluency during the same session.

Figure 2. Linear Regression Plot of Mean Latency Times and SLDs of Individual CWS



4. Discussion and Future Directions

Despite common advisement to parents, there is a limited literature that links parental RTL to fluency in CWS, both during individual interactions, as well as to long-term outcomes. Nevertheless, parents are encouraged to alter turn-taking strategies when interacting with CWS (“Seven Tips for Talking with Your Child”, The Stuttering Foundation; ASHA’s “5 Tips to Share with Parents of Preschoolers Who Stutter”, Whelan, 2019; see also Bloodstein et al., 2021 for a summary of indirect treatment for stuttering). Analysis of the unique, longitudinal IISRP data has the potential to either strengthen or diminish the evidence-base for such advisement. Although our work is not yet complete, these initial findings do not provide strong support for this common advisement.

We will continue to analyze all files in Sample 1 of the data for RTL. Results from Sample 1 so far, prior to parent counseling, suggest that the most variability between RTL profiles was found across individual parent-child interactions, rather than among the three groups. We plan to examine profiles of RTL once parents were advised to increase turn-taking latencies; the IISRP followed children for a minimum of 3 years after enrollment. Thus, we will be able to ascertain whether parents followed the guidance, and if so, what effects were observed in their child's fluency profile.

Disclosures

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