# **ABSTRACT**

The purpose of this study was to investigate whether the loci of stuttering is related to relative level of language development. Participants were 30 pre-school age boys who stutter who produced an average of 83 sentences during a parent-child conversation. Results indicated that children who stutter (CWS) with lower MLU were relatively more likely to stutter on sentence-initial function words, while CWS with high MLU were relatively more likely to stutter on function words at other positions. Results are taken to suggest that CWS's level of language development influences the loci of their conversational stutterings.

# INTRODUCTION

It has been speculated that some speech and language disorders (e.g., SLI) may be the product of a deficit in procedural memory (Ullman & Pierpont, 2005). Procedural memory consists of skilled or rule-like behavior, while declarative memory consists of facts and events (Rovee-Collier, Hayne, & Columbo, 2001). One piece of evidence that a delay or deficiency of procedural memory may be involved in stuttering is that CWS tend to stutter on function words at the beginning of linguistic units (Au-Yeung, Howell, & Pilgrim, 1998; Buhr & Zebrowski, 2008). This suggests that the word-class effect on the stutterings of at least some CWS may associated with their syntacticplanning (Anderson & Conture, 2004; Bernstein, 1981) and reflect a linguistic vulnerability for some CWS (Conture, 2008), resulting in overt instances of stuttering when in the presence of a stressor. To test this possibility, we measured CWS's expressive language (i.e., MLU) and correlated it with stuttering on function words and at sentence-initial position. Children with relatively lower MLU were speculated to stutter more on function words, especially at sentence-initial position, due to challenges with development of procedural linguistic skills such as syntactic planning.



# **Relation of Stuttering Loci** to Language Development in Early Childhood



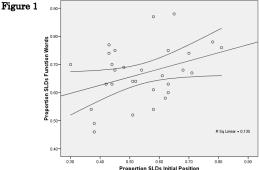
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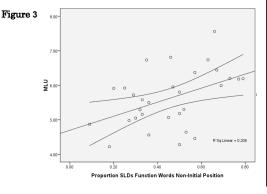
# **METHOD**

Participants: Thirty male preschool-age children who stutter (CWS) participated in the present study. CWS had to (a) score at or above the 16th percentile rank on all speech and language standardized tests. (b) pass a hearing screening, (c) exhibit three or more stutter-like disfluencies (SLDs) per 100 words, and (d) receive a score of 11 or above on the Stuttering Severity Instrument - 3 (SSI-3; Riley, 1994).

Procedure: All pre-school participants participated in approximately 15-min. parentchild conversations, which were transcribed and coded for stuttering-like disfluencies (SLDs). After removal from the transcript of non-analyzable utterances (e.g., abandoned, interrupted, and unintelligible) and those not containing both a subject and a verb, an average of 83 sentences per participant were available for final analysis. Dependent measures for each child included mean length of utterance (MLU), proportion of SLDs that were function words. and proportion of function words that were sentence-initial. Correlations were used to relate MLU to both types of proportions across all 30 children.



# Figure 2 on SLDs Initial Positio



# **RESULTS**

1) Figure 1: Proportion of SLDs that were function words was significantly positively correlated with the proportion of SLDs that were sentenceinitial words, r = 0.320, p <0.05. Meaning: For pre-school male CWS, function words and SLDs often co-occur at the sentence-initial position.

2) Figure 2: MLU was significantly negatively correlated with the proportion of SLDs that were sentenceinitial, r = -0.352, p < 0.05. Meaning: Pre-school age male CWS with higher MLU have less trouble with syntactic planning (i.e., the covert formulative acts that precede the onset of an sentence)

3) Figure 3: At the sentenceinitial position, MLU was not related to the proportion of SLDs that were function words, r = 0.186, p > 0.05, while at the sentence-noninitial position, this positive correlation was significant, r = 0.454, p < 0.01. Meaning: As language develops in young CWS, and sentences become longer and more complex, the tendency to stutter on function words shifts from sentenceinitial to non-initial positions.

# **DISCUSSION**

First main finding: For pre-school age male CWS, sentence-initial stuttering tends to to occur on function words, consistent with previous findings (e.g., Buhr & Zebrowski, 2008).

Second main finding: Pre-school age male CWS with higher levels of language development are less likely to stutter at the sentence-initial position, consistent with previous findings (e.g., Williams, Silverman, & Kools, 1969).

Third main finding: Pre-school age male CWS with higher levels of language development are relatively more likely to stutter on function words at sentence-non-initial positions, consistent with previous research (e.g., Au-Yeung, et al., 1998).

Conclusion: Language development of preschool-age male CWS - as reflected by their MLU – appears to influence the loci of stuttering, with increases in MLU shifting the loci from sentenceinitial to non-initial function words.

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