

Disfluency & ASD



Linguistic Approaches to Autism and Neurodevelopmental Disorders

What is Fluency?

- Fluency/Disfluency describes the skill with which an individual produces forward flowing speech
- Fluency/Disfluency can be viewed as a continuum which varies greatly across time and settings

Speakers are fluent in their speech production if they produce normally long strings of sounds at a normally rapid rate without pausing or hesitation, and with a normal absence of effort
Starkweather, 1987

Disfluencies

On-line strategies to self-repair perceived errors

- System self-monitors for errors and appropriateness
- Level of monitoring is context dependent
- When detected errors are sufficiently alarming, the speaker stops and revises the sound, syllable, word, or phrase

Strategies to gain extra time during speech planning and execution

- System stalls by re-executing a previous unit
- Allows time for “catching-up”
- Disfluency type hints to the nature of the deficit

Disfluencies

Breakdown in the linguistic plan

The individual struggles with organizing and formulating what they want to say

- Phrase Repetitions – Conceptualization/syntactic complexity
- Whole Word Repetitions - Word finding
- Part Word Repetitions – Phonological
- Pauses & Interjections – Processing difficulties
- Abandoned Words/Phrases – Topic maintenance

Breakdown in the timing or sequencing of the motor plan

- The individual knows what they want to say but motor plan is lacking
- Results in sound/syllable repetitions, prolongations & blocks

What is Stuttering?

Stuttering is a neurologically based disorder which impairs an individual's ability to time and sequence the underlying movements necessary for speech

This often results in:

- The characteristic stuttering behaviors
- A lack of confidence in one's ability to effectively communicate and a sense of "losing control"
- The individual employing increased tension, struggle or pushing to try to force the words out
- The anticipation of future speech breakdowns causing the individual to avoid talking, switch words or do anything to hide the overt behaviors

Differential Diagnosis

| | Typical Disfluencies | Stuttering | Atypical Disfluencies |
|----------------------|--|---|---|
| Type of Behavior | <ul style="list-style-type: none"> • Whole-word & phrase repetitions • Sentence Revisions • Interjections/Fillers | <ul style="list-style-type: none"> • Whole & part word repetitions • Prolongations • Blocks | <ul style="list-style-type: none"> • Whole or part word repetitions • Sound prolongations • Sound insertions |
| Location of Behavior | <ul style="list-style-type: none"> • Primarily between words | <ul style="list-style-type: none"> • Within words • Typically initial position • Tendency to cluster | <ul style="list-style-type: none"> • Medial and/or final position |
| Frequency | <ul style="list-style-type: none"> • < 10% of Syllables | <ul style="list-style-type: none"> • > 4% of syll. • 2x as disfluent • Noticed >10% | ? |
| Duration | <ul style="list-style-type: none"> • 1-2 Repetitions | <ul style="list-style-type: none"> • 3 < Repetitions • Truncated pauses between repetitions | ? |
| Reactions | <ul style="list-style-type: none"> • Typically no reactions & minimal awareness | <ul style="list-style-type: none"> • Secondary behaviors • Avoidances • Fears/Anxiety | <ul style="list-style-type: none"> • Typically no reactions & minimal awareness |

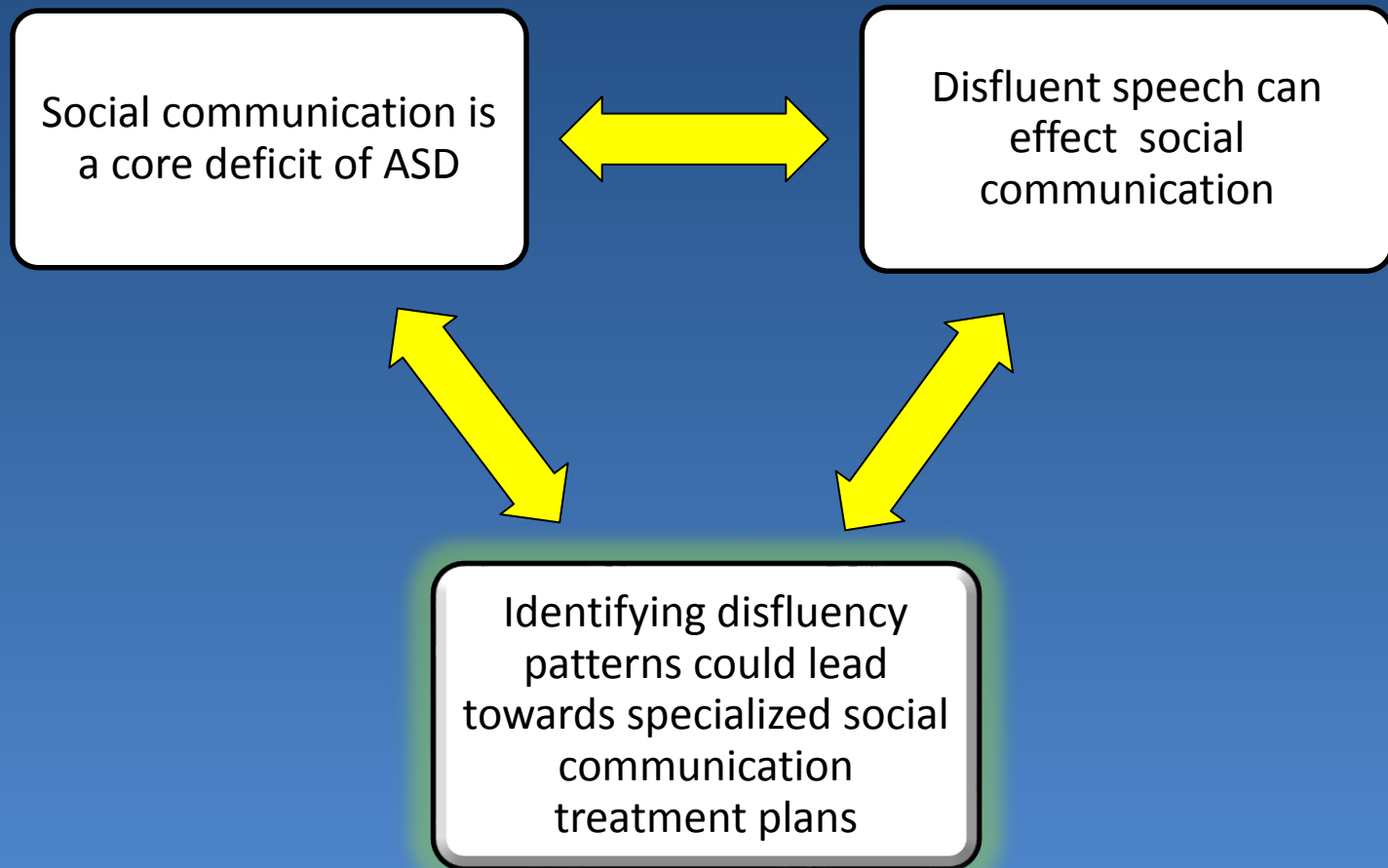
Fluency & ASD

Case reports and case series have suggested a higher prevalence of disfluencies in individuals with ASD. These include:

- Typical disfluencies
- Stuttering-like disfluencies
- Atypical disfluencies

(Lake et al., 2011; Scott et al., 2013; Shriberg et al., 2001; Scott et al., 2006; Sisskin, 2006)

Why study disfluency and ASD?



Fluency & ASD

| Study | Authors | Year | Pop | Finding |
|---|--|------|---------------------------|--|
| Speech and prosody characteristics of adolescents and adults with high-functioning autism and Asperger syndrome | Shriberg, Paul, McSweeney, Klin, Cohen & Volkmar | 2001 | 15 HFA 15 AS 53 CG | <ul style="list-style-type: none"> • CG > fluent than HFA & AS • HFA > PWR, WR, REV than CG • AS > PWR than CG |
| Brief Report: Relations between prosody performance and communication and socialization ratings in high functioning speakers with autism spectrum disorders | Paul, Shriberg, Mcsweeny, Cicchetti, Klin, & Volkmar | 2005 | (Same as Above) | Phrasing errors do not appear to have any significant effect on listeners' judgments of their social/communication skill (Vineland) |
| Listener vs. speaker oriented aspects of speech: studying the disfluencies of individuals with autism spectrum disorders | Lake, Humphreys, & Cardy | 2011 | 13 ASD 13 TDP | <ul style="list-style-type: none"> • ASD < Filled pauses than TDP • ASD > Silent pauses than TDP • ASD < Rev than TDP • ASD > Rep than TDP |
| Preliminary study of disfluency in school-aged children with autism | Scaler Scott, Tetnowski, Flaitz, & Yaruss | 2014 | 11 AS 11 CWS 11 TDP | <ul style="list-style-type: none"> • No diff in TWD • No diff in % NSD • CWS > SLD than AS • AS > SLD than TDP • No differences in WFD |

Mutual Questions

Can the disfluencies
distinguish children
with ASD from
typically developing
peers?

Do disfluency
rates/types correlate
with parent/clinician
measures of social
impairment?

Poster Title: "Disfluencies Distinguish the Speech of Children with Autism Spectrum Disorder"

Authors: Meghan Santulli, Julia Parish-Morris, Emily F. Ferguson, Leila Bateman, Robert T. Schultz, Joseph G. Donaher

Session date/time: Friday, May 13, 2016, 5:30 PM - 7:30 PM

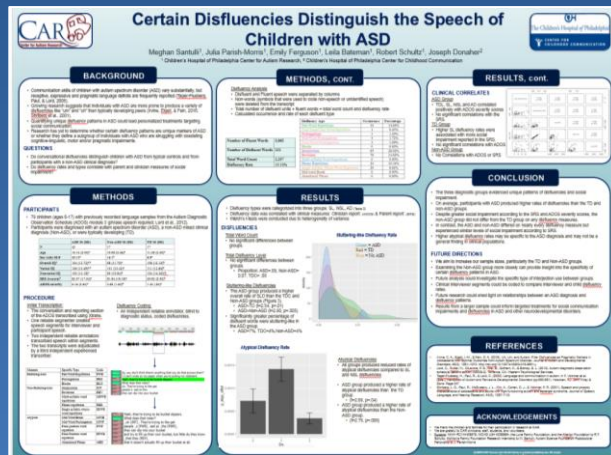
Baltimore Convention Center, Hall A.

Certain Disfluencies Distinguish the Speech of Children with ASD

79 Children aged 6-17

Categorized into three groups:

- ASD – N/45
- Non-ASD (mixed clinical) N/17
- Typical Dev. Children N/17



Data from previously recorded clinical evaluations

ADOS (Module 3-expressive language skills with range of sentence types and grammatical forms)

Results: Disfluency

No significant differences in TDL

Unique patterns of disfluencies

ASD produced significantly more Stuttering-Like Disfluencies than Non-ASD & TDC

ASD produced significantly more Atypical Disfluencies than Non-ASD & TDC

TDC & Non-ASD *did not differ* on any disfluency measure

Results: Clinical Measures

Social Impairment: Parent Report - SRS
Clinician Report - ADOS

For ASD group TDL, SL, NSL, AD correlated with ADOS score but not with SRS

For TDC higher SL disfluency rates associated with more negative SRS scores

For Non-ASD disfluency rates *did not correlate* with ADOS or SRS scores

Future Directions

- Future research could shed light on relationships between an ASD diagnosis and disfluency patterns
 - Examine the Non-ASD group more closely to gain insight into the specificity of certain disfluency patterns in ASD versus ASD+
 - Investigate disparities in specific types of Non-SL disfluencies i.e. interjection use between groups
 - Explore factors impacting relationship between disfluency and social impairment
- Results from a larger sample could inform targeted treatments for social communication impairments and disfluencies in ASD and other neurodevelopmental disorders