

The Edinburgh Disfluency Group

<http://edgwiki.wikidot.com/>

Researching disfluency from a psycholinguistic perspective:

- Language and speech encoding
 - Grammar
 - Phonology
 - Phonetics
- A general interest in
 - Speech errors
 - Speech-error repair and avoidance mechanisms





The Inner speech of People who Stutter

- does it contain more errors?

Paul Brocklehurst & Martin Corley
University of Edinburgh
2010

Funded by
The Economic and Social Research Council



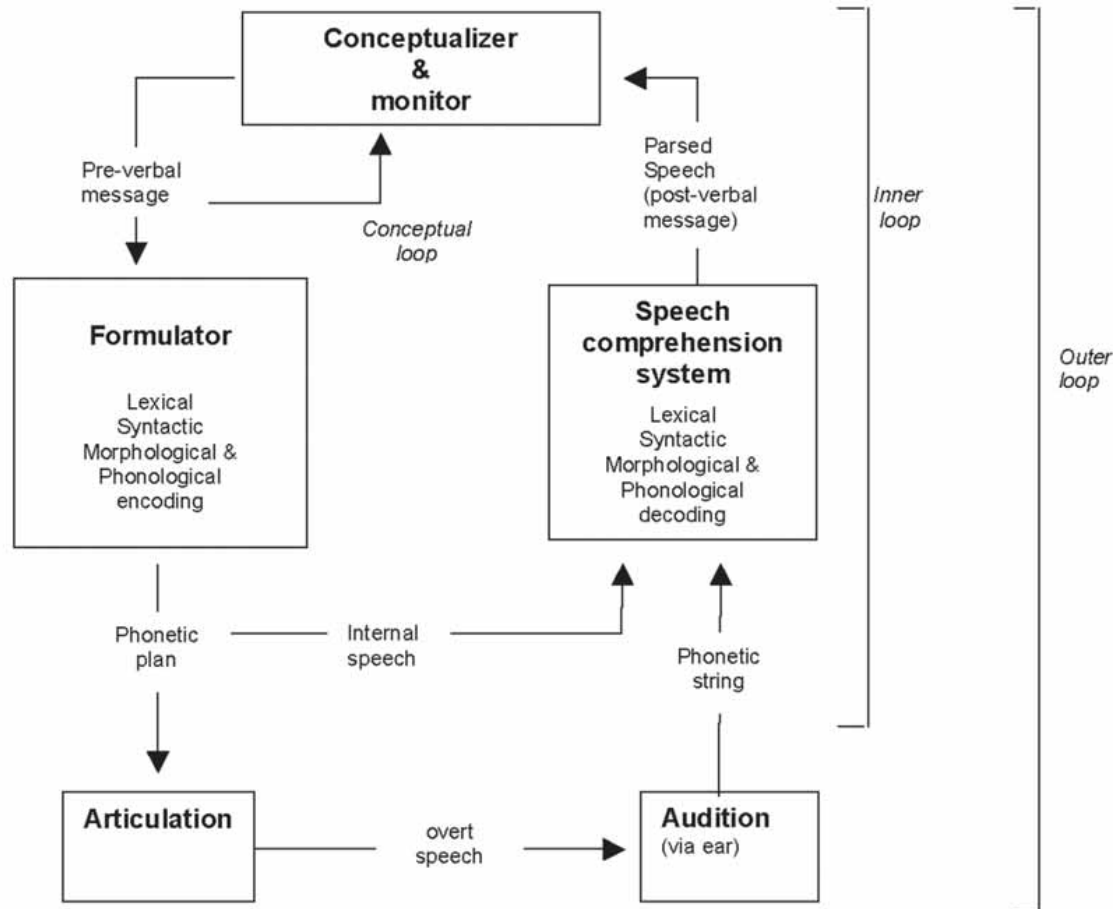
The Covert Repair Hypothesis

Postma & Kolk (1993)

- Disfluencies arise because speakers try to repair errors internally, before starting to speak
- PWS are particularly disfluent because impairment of phonological encoding causes their speech-plans to contain more errors.

Internal vs. Auditory monitoring

Levelt's (1989) Model



Stuttering phenomenology

- PWS do not generally report experiencing problems with inner-speech



Previous research

Few studies have investigated self-reports of speech errors

- Postma & Kolk (1992)
 - PWS and controls
 - Tonguetwisters - spoken out loud
 - with and without auditory masking
 - Participants pressed a button each time they made an error

Findings:

In both the normal speech and the noise masked conditions...

- “No significant group effects were found
 - for the error percentages...
 - or error detection accuracy”

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Oppenheim & Dell (2008)

- Participants recited tongue twisters
 - Internally and overtly
- and self-reported exactly what errors they made
 - In inner-speech
 - and out loud
 - Normally fluent speakers only
 - No masking

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The current study

Compared to normally fluent speakers....

Do people who stutter...

- self-report more speech errors?
- actually make more speech errors?
 - In inner speech?
 - In overt speech?

The current study

Tonguetwister repetition

- 32 people who stutter
- 32 normally fluent controls - matched for age, gender and education
- 48 tonguetwisters per participant
- Speech-rate carefully controlled

- DVs

- Onset errors
 - Self reports
 - Experimenter ratings
- Word-order errors
 - Self reports
 - Experimenter ratings

	Masking (pink noise)	No masking
Inner speech	12	12
Out loud	12	12

The current study

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procedure

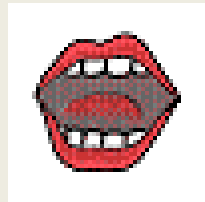
- Each participant recites forty eight, 4-word tongue-twisters
e.g. Lean reed reef leach
- Each tongue-twister repeated 8 times
to a (visual) metronome...
 - 4 x familiarization @ 1 word/sec
 - 4 x testing @ 2 words/sec

lean reed reef leach

(familiarization phase)

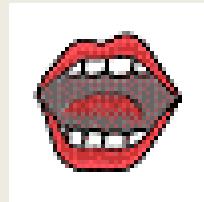
lean reed reef leach

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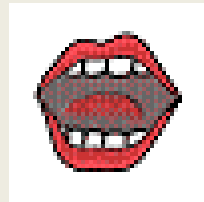
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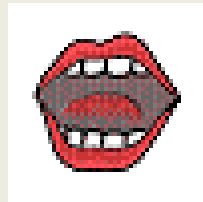


lean reed reef leach

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lean reed reef leach

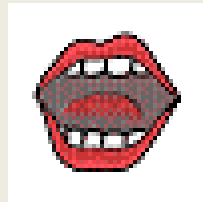


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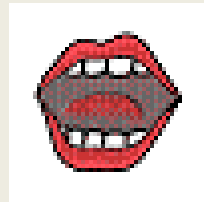
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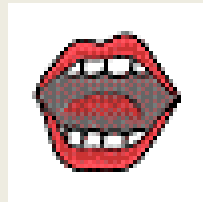


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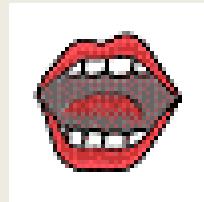
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lean reed reef leach



lean reed reef leach



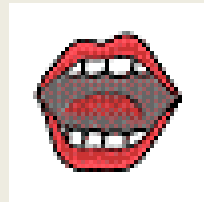
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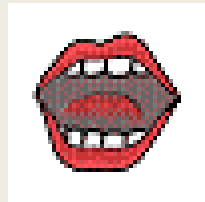


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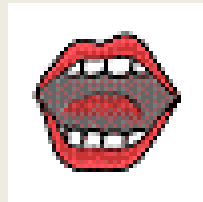


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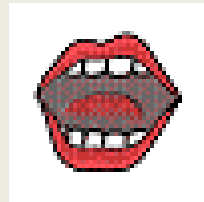
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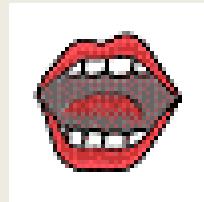
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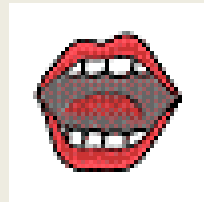
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lean reed reef leach



lean reed reef leach



lean reed reef leach



Press SPACEBAR to continue



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lean reed reef leach



Type any errors in the space below
Then press SPACEBAR to continue

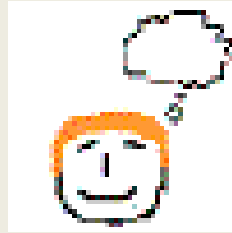
lean reed reef leach



Press SPACEBAR to continue



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Lean reed reef leach



Type any errors in the space below
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lean reed reef leach



Press SPACEBAR to continue



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Lean reed reef leach



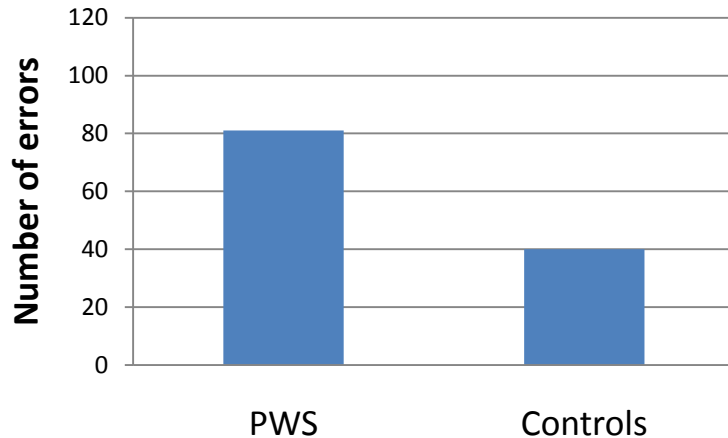
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results

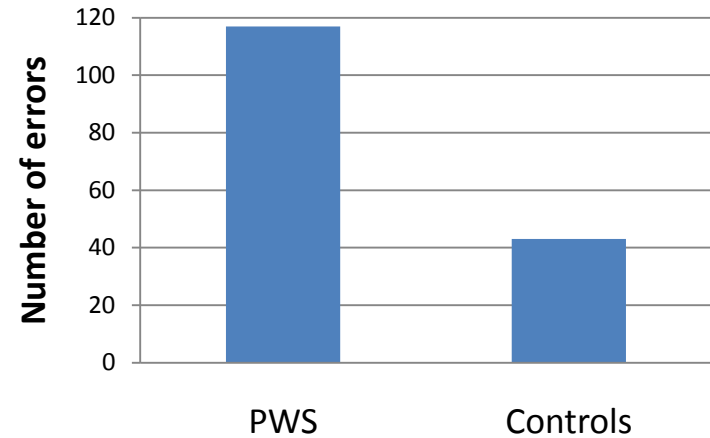
onset errors – self-ratings

e.g. lean reed reef leach → Lean reed leaf leach

inner speech



overt speech



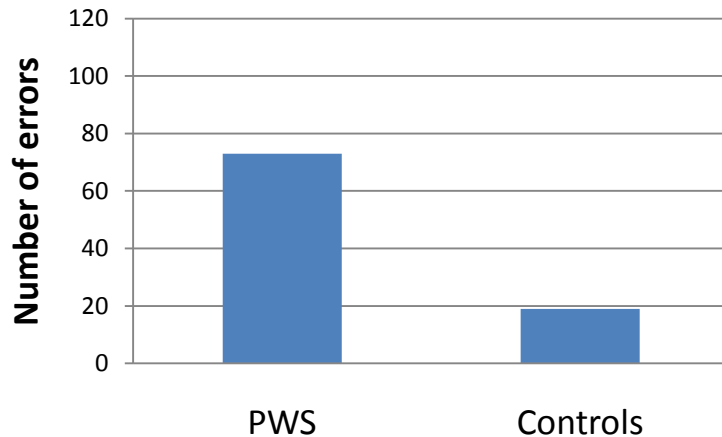
- PWS self-report more errors***
- Overt errors more frequently self-reported*
- No significant interactions.

results

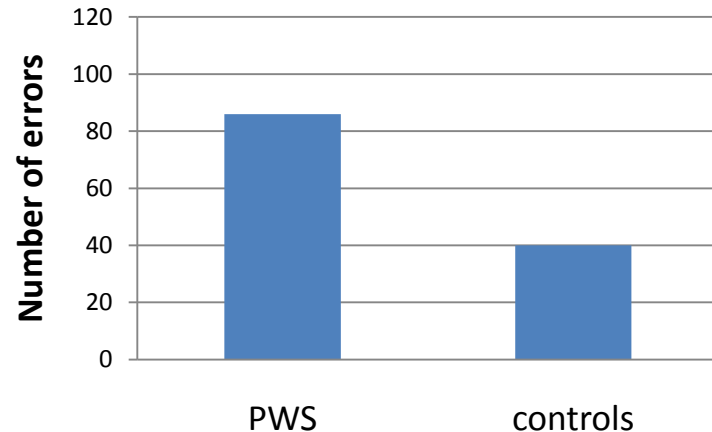
word-order errors

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inner speech



overt speech



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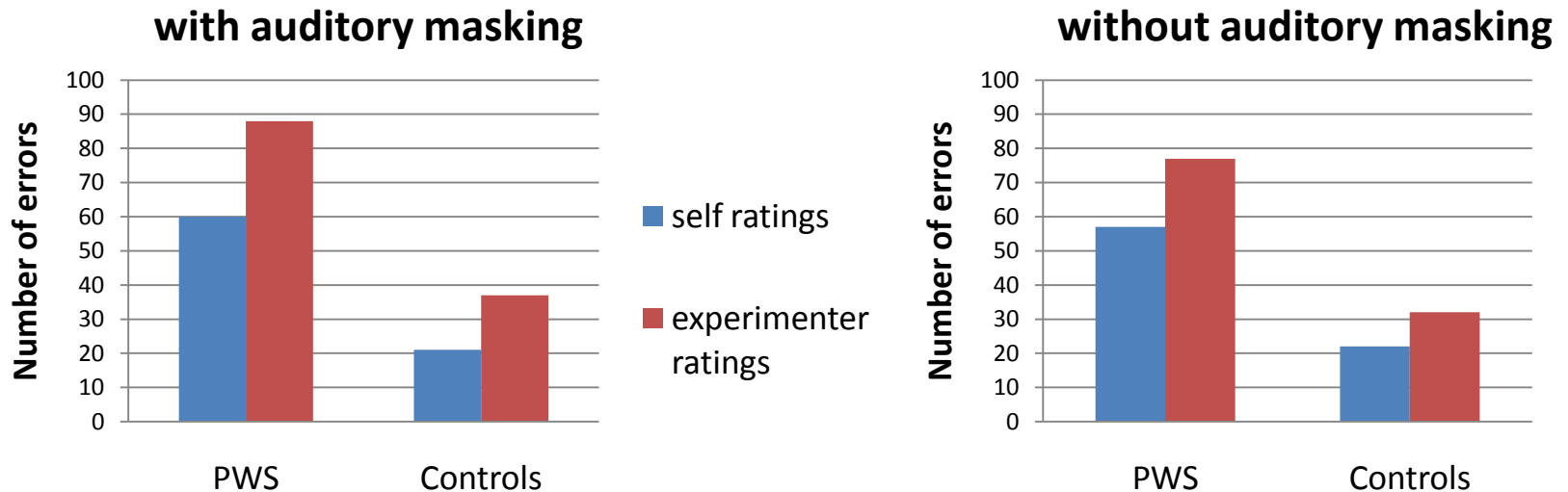
Compared to controls...

- the PWS group self-reported more errors,
 - both in inner and in overt speech
- However, did they actually make more errors?
 - how accurate were their self-reports?

results

onset errors – monitoring vigilance

e.g. lean reed reef leach → Lean reed leaf leach

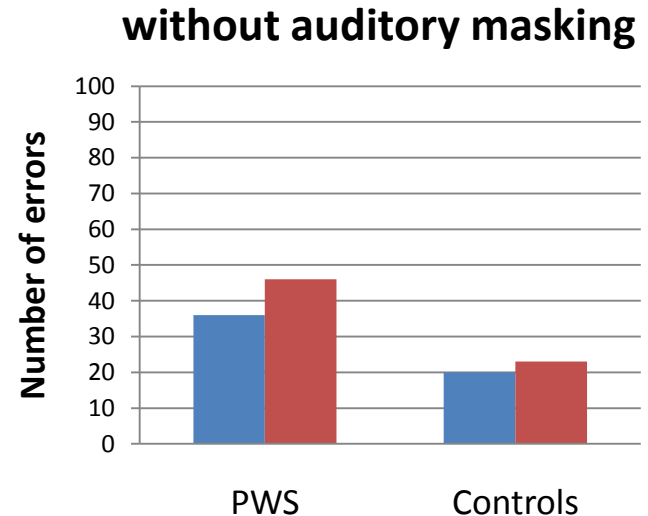
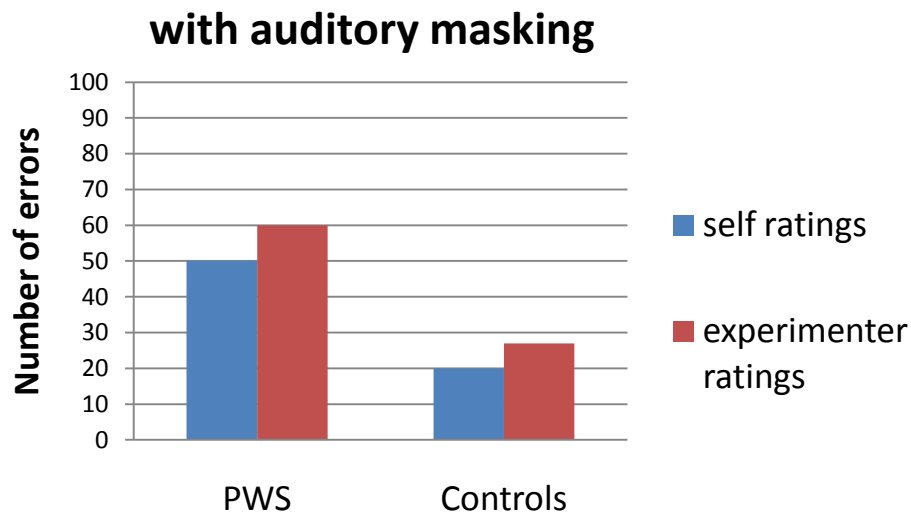


- Fewer self-reports than experimenter reports***
- No significant interactions.
- **For both PWS and controls...**
the ratio of self-reports to experimenter reports is similar

results

word-order errors – monitoring vigilance

e.g. lean reed reef leach → Lean reed leach reef



- Fewer self-reports than experimenter reports*
- No significant interactions
- **For both PWS and controls...**
the ratio of self-reports to experimenter reports is similar

- PWS self-reported more errors than Controls
- Monitoring vigilance of PWS & Controls was similar

Therefore we can conclude that....

- PWS actually made more errors than Controls
 - in overt speech
 - and also in inner speech

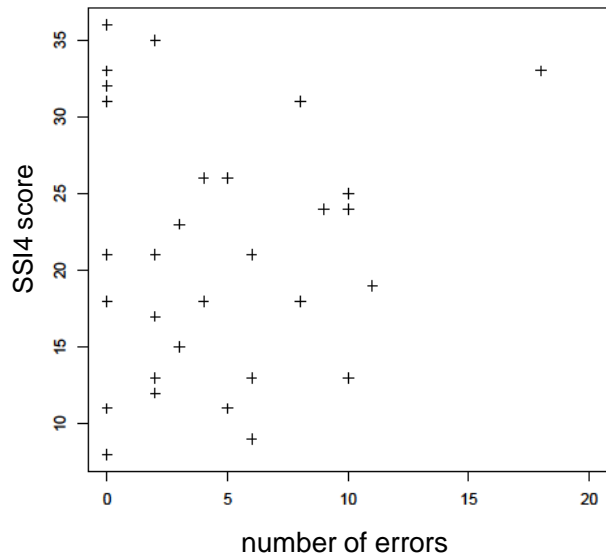
 - Phonological encoding errors
 - and also Word-order errors

One final question...

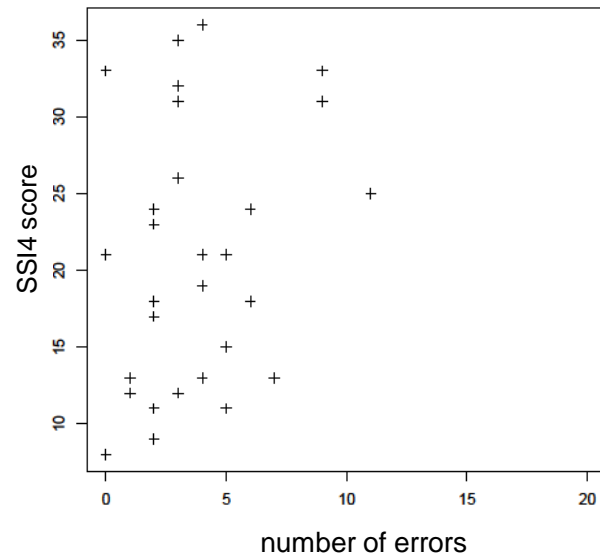
- Is the severity of stuttering related to the number of inner-speech errors PWS self-report?
 - According to the Covert Repair Hypothesis, it should be.

PWS

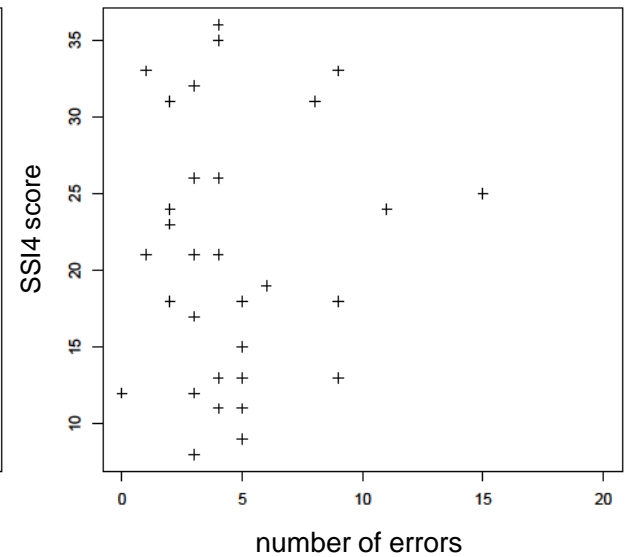
self reports (inner speech)



self reports (overt speech)



independent rater reports



Stuttering severity (SSI4) scores
not correlated to speech errors

conclusions

- Compared to normally fluent speakers, PWS are less proficient at phonological encoding and make more phonological encoding errors.
- They are also less proficient at other aspects of language encoding.
- However, the tendency to make more errors of phonological encoding does not account for the severity of stuttering-like disfluencies as measured by the SSI4 or participants' own self-ratings

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Thank you 😊

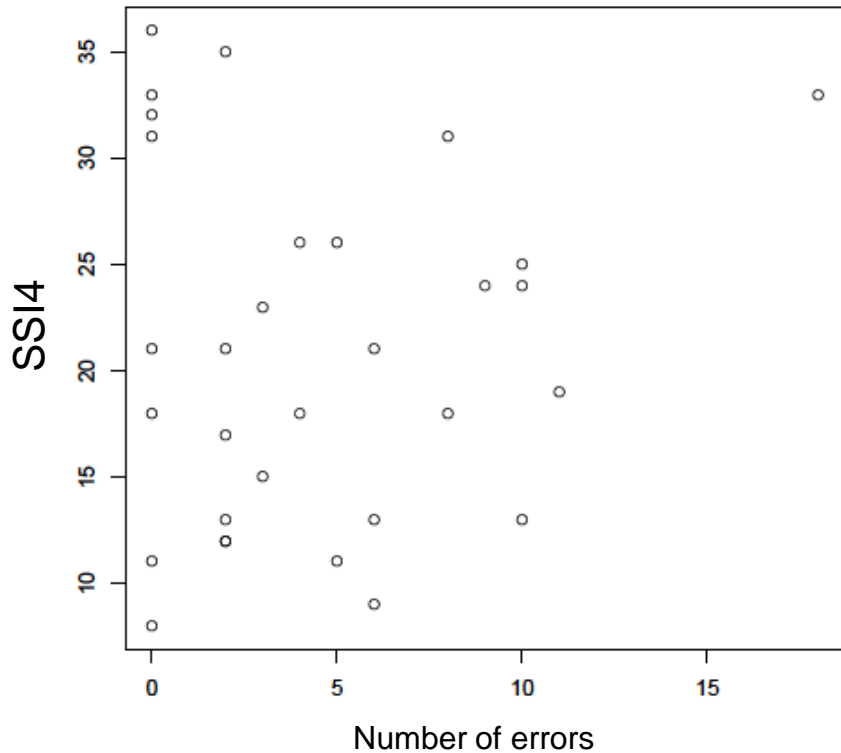
Any questions?



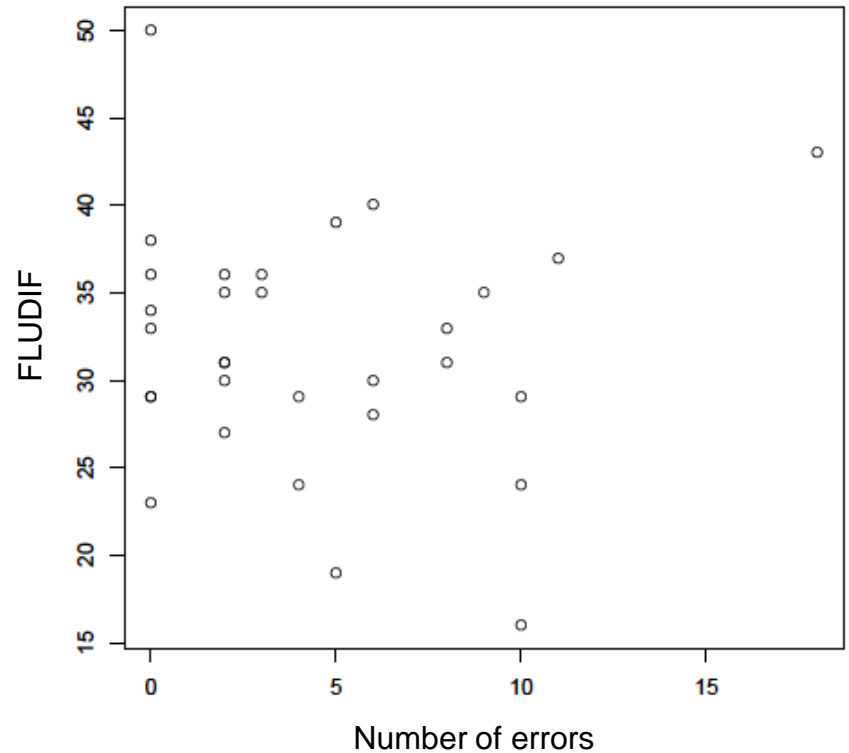
Inner speech - onset errors

in PWS

Stuttering severity (SSI4)



Fluency difficulty self-rating

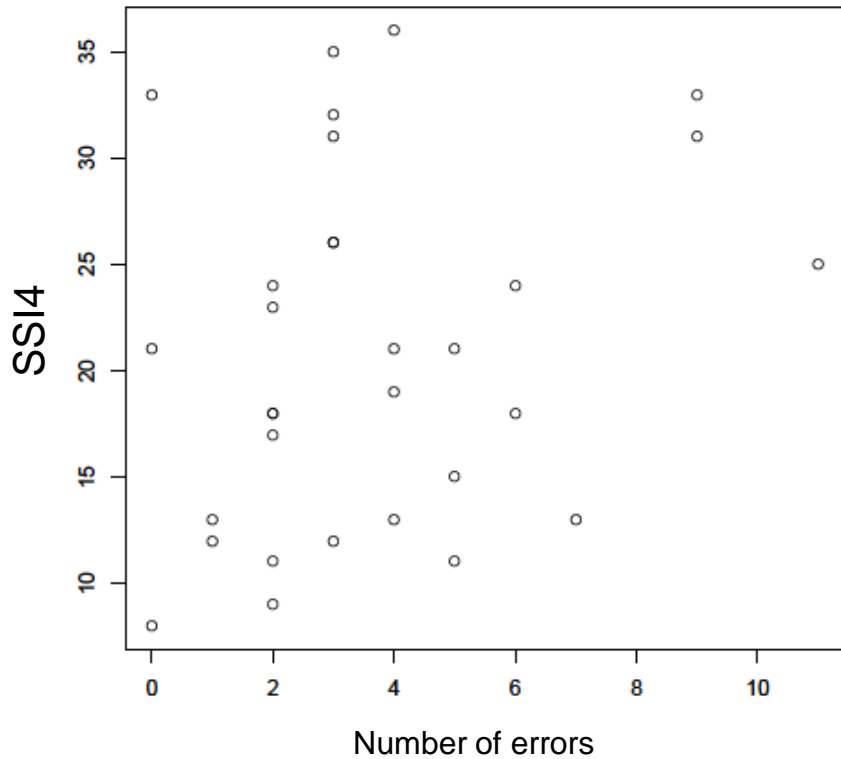


Participants who stutter

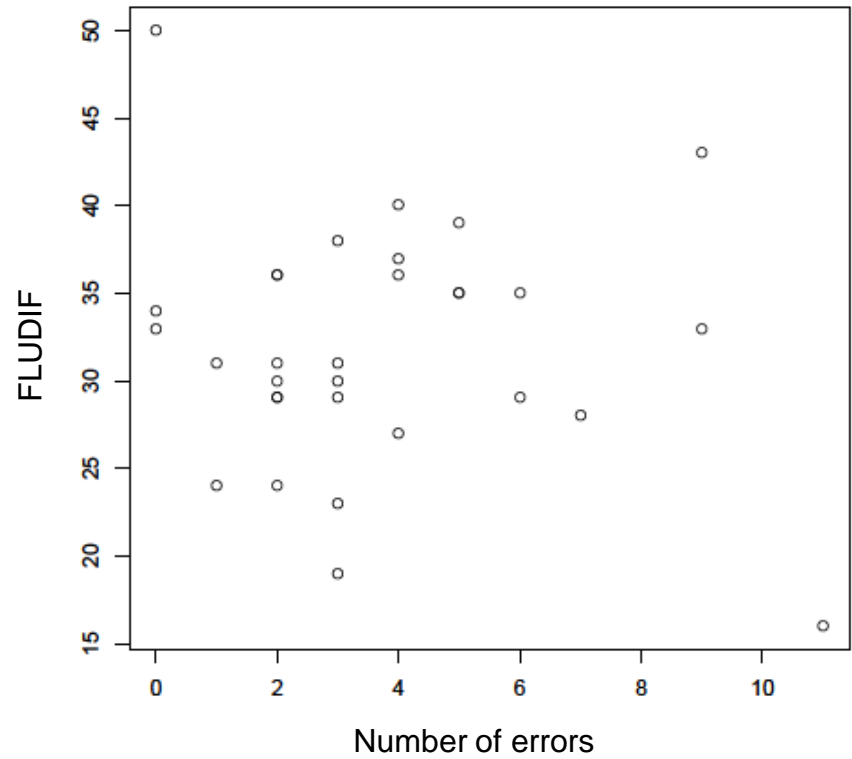
Overt speech - onset errors

in PWS (self-reports)

Stuttering severity (SSI4)



Fluency difficulty self-rating



Participants who stutter