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

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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

Picture copied from: http://www.mnsu.edu/comdis/isad7/papers/badminton7/badminton17.html
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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• “No significant group effects were found
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Oppenheim & Dell (2008)

– Participants recited tonguetwisters
  – Internally and overtly

– and self-reported exactly what errors they made
  • In inner-speech
  • and out loud

  – Normally fluent speakers only
  – No masking
Oppenheim & Dell (2008)

- Participants recited tonguetwisters
  - Internally and overtly
- and self-reported exactly what errors they made
  - In inner-speech
  - and out loud

- Normally fluent speakers only
- No masking
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

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<thead>
<tr>
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<th>Masking (pink noise)</th>
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procedure

• Each participant recites forty eight, 4-word tonguetwisters
  e.g. Lean reed reef leach

• Each tonguetwister 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
lean reed reef leach
lean reed reef leach

--
lean reed reef leach

---
lean reed reef leach

----
lean reed reef leach
lean reed reef leach
lean reed reef leach
lean reed reef leach
lean reed reef leach

----

[Image of lips]
lean reed reef leach
lean reed reef leach
lean reed reef leach
lean reed reef leach
lean reed reef leach
lean reed reef leach
lean reed reef leach
lean reed reef leach
lean reed reef leach
lean reed reef leach
lean reed reef leach
lean reed reef leach

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

|
lean reed reef leach

Press SPACEBAR to continue
Lean reed reef leach

Type any errors in the space below
Then press SPACEBAR to continue
lean reed reef leach
Lean reed reef leach

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

onset errors – self-ratings

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

• PWS self-report more errors***
• Overt errors more frequently self-reported*
• No significant interactions.
results
word-order errors
e.g. lean reed reef leach→ Lean reed leach reef

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