Possibilities in Neurogenic Stuttering Treatment

An empirical study on therapists` experiences
„Stuttering is more than a riddle. It is at least a complicated, multidimensioned jigsaw puzzle, with many pieces still missing” (Van Riper, 1982, 1).
Presentation agenda

1. Definition and etiology
2. State of research in literature
3. Research questions
4. Empirical study and methodology
5. Findings
6. Conclusion
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Definition

Speech dysfluencies in the form of repetitions, prolongations and/or blocks

Diagnosis of a neurological disturbance or underlying disease

Direct correlation between the neurological disturbance and the onset of speech dysfluencies

Occurrence of symptoms for the first time in life or massive change or aggravation of existing stuttering pattern

Possible onset at any age

Neurogenic Stuttering

Etiology

- Cerebrovascular disease
  - Head trauma/traumatic brain injury
  - Neurodegenerative disease
  - Tumor
  - Epilepsy
  - Intoxication
  - Neurosurgery
  - Other diseases of the central nervous system
## Presentation agenda

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State of research

„Acquired stuttering in adults has received little attention relative to that given developmental stuttering“ (Marshall & Starch, 1984, 87).

„Extensive research has been conducted in the field of developmental stuttering, and many facts about this disorder are well documented in the developmental stuttering literature. An equivalent body of knowledge is not available in the area of neurogenic stuttering […]“ (Ringo & Dietrich, 1995, 117f.).
State of research

- Limited number of publications
- Single case studies
- Lack of empirical (group) studies

Critique:
- lack of objectivity of studies
- lack of comparability of data
- inaccurate sampling procedure
State of research

- Increased demand for research in the area of neurogenic stuttering treatment
- Highly discrepant hypothesis

„Our therapy experience with adults with neurogenic stuttering has been very encouraging. [...] in a good many cases we have seen the stuttering problem completely eradicated“ (Canter, 1971, 143).

„Results have rarely been dramatic and not always encouraging“ (Rosenbek, 1984, zit. n. Baumgartner & Duffy, 1997, 91).

„The call for more systematically collected data is long overdue“ (Curlee, 1995, 125).
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Research questions

- How is neurogenic stuttering currently treated in Germany?
- Is neurogenic stuttering treatable?
- Which factors evoke a good prognosis?
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Empirical study and methodology

$\textbf{Research method:}$
Written survey of 700 speech language pathologists in Germany

$\textbf{Sampling procedure:}$
Random sample
Two-stage sampling procedure:
Stage 1: Therapists (cluster)
Stage 2: Clients

$\textbf{Research tool:}$
Structured questionnaire
(30 questions: 178 items)

$\textbf{Period of examination:}$
4 years (1.08.2004 – 1.08.2008)
# Questionnaire – subject matters

<table>
<thead>
<tr>
<th>Category</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographic data</td>
<td>Age, gender, handedness</td>
</tr>
<tr>
<td>Symptoms</td>
<td>Core symptoms, secondary behaviors etc.</td>
</tr>
<tr>
<td>Etiology</td>
<td>Medical history, neurological disturbance etc.</td>
</tr>
<tr>
<td>Therapy targets</td>
<td>Individual aims</td>
</tr>
<tr>
<td>Type of treatment</td>
<td>Stuttering therapy, general speech therapy etc.</td>
</tr>
<tr>
<td>Focus of treatment</td>
<td>Fluency shaping or modification techniques</td>
</tr>
<tr>
<td>Response to treatment</td>
<td>Learning, adopting and transferring techniques</td>
</tr>
<tr>
<td>Treatment outcome</td>
<td>Improvement, aggravation, difficulties etc.</td>
</tr>
</tbody>
</table>
## Pretest

### Two stage Pretesting (Prüfer & Rexroth, 2000)

<table>
<thead>
<tr>
<th>Phase 1: cognitive pretest</th>
<th>Phase 2: field pretest (pilotstudy)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\text{Cognitive interviews}$</td>
<td>$\text{Written survey}$</td>
</tr>
<tr>
<td>$\text{n} = 7 \text{ therapists}$</td>
<td>$\text{n} = 100 \text{ therapists}$</td>
</tr>
<tr>
<td>different occupational groups</td>
<td>$\text{Split-ballot procedure}$</td>
</tr>
<tr>
<td>different therapy setting</td>
<td></td>
</tr>
</tbody>
</table>

**assure** manageability of the questionnaire and correct understanding of questions

**avoid** ambiguity
Data collection

Pre-information
- Information letter on the upcoming survey

Questionnaire
- added by:
  - correspondence letter
  - letter of recommendation from the faculty
  - stamped self-addressed envelope

Follow-up
- Contacting the non-responders by phone

Data analysis
- Data collection and data preparation with SPSS 17.0
Return rate

Return rate (n = 700)

- 34.0% Response
- 66.0% No Response
- 12.7% Neurogenic stuttering clients among the clientele
- 53.3% No neurogenic stuttering clients among the clientele

89 therapists (12.7%) have treated one or more clients with neurogenic stuttering

68 case descriptions (9.7%)

after plausibility check: 61 data sets (8.7%)
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Results – age

Bar chart – age (n = 52)

range: 8-87 years
mean: 55.4 years
standard deviation: 17.4 years.
In three fourths of all cases neurogenic stuttering clients showed accompanying speech disorders.

In every second case the client had aphasia.
Results – secondary behaviors

Secondary behaviors (n = 61)

- Irritation: 70.5%
- Difficulties in handling communication situations: 60.7%
- Linguistic avoidance behavior: 47.5%
- Situational avoidance behavior: 47.5%
- Accessory movements: 32.8%
- Anxiety: 27.9%
- Others: 13.3%
- Others: 0%

95.1% of all patients showed secondary behaviors
**Results – Chosen type of treatment**

Type of treatment (n = 61)

- **90.2%** Specific stuttering therapy
- **59.0%** Breathing exercises
- **52.5%** Motor speech therapy/facial exercises
- **49.2%** Aphasia therapy/word finding exercises
- **45.9%** Relaxation techniques
- **18.0%** Other types of treatment
- **4.9%** Medical treatment

Huge variety of different types of treatment

Average: use of 3.21 types of treatment (sd = 1.07)

Specific stuttering therapy as the most used type of treatment
### Results – Specific stuttering therapy

Type of stuttering treatment \((n = 54)\)

<table>
<thead>
<tr>
<th>Stuttering modification</th>
<th>n</th>
<th>Fluency Shaping</th>
<th>n</th>
<th>Speech devices</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easy onset</td>
<td>30</td>
<td>Slowing speech rate</td>
<td>37</td>
<td>Metronome</td>
<td>11</td>
</tr>
<tr>
<td>Easy syllable repetitions</td>
<td>21</td>
<td>Rhythmical speech</td>
<td>37</td>
<td>Chorus speaking</td>
<td>9</td>
</tr>
<tr>
<td>Easy articulatory contacts</td>
<td>15</td>
<td>Continuous phonation</td>
<td>5</td>
<td>Shadowing</td>
<td>7</td>
</tr>
<tr>
<td>Cancellation</td>
<td>14</td>
<td>Prolonged speech</td>
<td>5</td>
<td>Pacing Board</td>
<td>5</td>
</tr>
<tr>
<td>Use of starting sounds</td>
<td>9</td>
<td></td>
<td></td>
<td>Biofeedback</td>
<td>1</td>
</tr>
<tr>
<td>Pull-out</td>
<td>8</td>
<td>Other fluency shaping techniques</td>
<td>3</td>
<td>Delayed auditory feedback</td>
<td>1</td>
</tr>
<tr>
<td>Other modification techniques</td>
<td>2</td>
<td></td>
<td></td>
<td>Other speech devices</td>
<td>3</td>
</tr>
</tbody>
</table>
Results – Core techniques

Focus of stuttering therapy (n = 42)
Results – Psycho-social methods

Psycho-social methods (n = 56)

- Information on stuttering: 90.9%
- Anxiety reduction: 70.4%
- Counseling of relatives: 58.2%
- In-vivo training: 55.4%
- Other psycho-social methods: 14.0%

94.9% of all therapists used psycho-social methods
Results – „Success“ of treatment

- Achievement of therapy target
- Improvement of speech (improvement of body functioning)
- Improvement of psycho-social factors (activity and participation, positive affect on context factors)
Results – Achievement of therapy target

Overall target of treatment

Degree of target achievement

No significant difference between the 3 superordinate targets of treatment with regard to the degree of target achievement ($\chi^2 = 1.429; p = 0.489$).
Results – Improvement of speech

Acquisition of the chosen speech technique (n = 44)

Use of the chosen technique in spontaneous speech (n = 42)

Comparison of speech techniques:
Easy onset, rhythmical speech, slow speech rate

No significant difference between the 3 techniques with regard to acquisition \( (\chi^2 = 0.421; p = 0.814) \) and use in spontaneous speech \( (\chi^2 = 1.668; p = 0.434) \)
### Results – Improvement of speech

**Correlation matrix – Acquisition and use in spontaneous speech**

<table>
<thead>
<tr>
<th></th>
<th>Acquisition</th>
<th>Use in spontaneous speech</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acquisition</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>r</td>
<td>1,000</td>
<td>.635**</td>
</tr>
<tr>
<td>Sig. (2-sided)</td>
<td></td>
<td>.000</td>
</tr>
<tr>
<td>n</td>
<td>44</td>
<td>42</td>
</tr>
<tr>
<td><strong>State of health</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>r</td>
<td>-.308*</td>
<td>-.143</td>
</tr>
<tr>
<td>Sig. (2-sided)</td>
<td>.045</td>
<td>.372</td>
</tr>
<tr>
<td>n</td>
<td>43</td>
<td>41</td>
</tr>
<tr>
<td><strong>Motivation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>r</td>
<td>.542**</td>
<td>.519**</td>
</tr>
<tr>
<td>Sig. (2-sided)</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td>n</td>
<td>44</td>
<td>42</td>
</tr>
</tbody>
</table>

The speech technique was acquired best, in cases of

- good state of health
- high therapy motivation (of the patient)

The use in spontaneous speech was best, in cases of

- an excellent acquired technique
- high therapy motivation (of the patient)

* sig. 0,05 level   **sig. 0,01 level
Results – Improvement of speech

Improvement in different speech situations

Comparison of speech techniques:
Easy onset, rhythmical speech, slow speech rate

- Improvement in therapy setting: $\chi^2 = 0.391; p = 0.572$
- Improvement in everyday life: $\chi^2 = 1.395; p = 0.238$
- Improvement in stressful situations: $\chi^2 = 0.043; p = 0.836$
## Results – Improvement of speech

<table>
<thead>
<tr>
<th></th>
<th>therapy setting</th>
<th>everyday life</th>
<th>stressfull situations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>acquisition</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>r</td>
<td>0.632**</td>
<td>0.515**</td>
<td>0.425*</td>
</tr>
<tr>
<td>Sig. (2-sided)</td>
<td>&lt;0.001</td>
<td>0.003</td>
<td>0.015</td>
</tr>
<tr>
<td>n</td>
<td>32</td>
<td>32</td>
<td>32</td>
</tr>
<tr>
<td><strong>use in spontaneous speech</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>r</td>
<td>0.461**</td>
<td>0.545</td>
<td>0.487**</td>
</tr>
<tr>
<td>Sig. (2-sided)</td>
<td>0.009</td>
<td>0.002</td>
<td>0.005</td>
</tr>
<tr>
<td>n</td>
<td>31</td>
<td>31</td>
<td>31</td>
</tr>
<tr>
<td><strong>motivation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>r</td>
<td>0.347*</td>
<td>0.576**</td>
<td>0.513**</td>
</tr>
<tr>
<td>Sig. (2-sided)</td>
<td>0.019</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>n</td>
<td>45</td>
<td>45</td>
<td>44</td>
</tr>
</tbody>
</table>

Improvement of speech in different speech situations is correlated with:

- the factor „acquisition“
- the factor „use in spontaneous speech“
- the factor „therapy motivation“

**sig. 0.01 level  * sig. 0.05 level**
Results – Improvement of speech

Transferring practiced skills

- improvement in therapy setting
- improvement in everyday life
- improvement in stressful situations

Motivation → Acquisition → Use
Results – Improvement of psycho-social factors

Reduction of psychological strain

- Yes: 83.6%
- No: 16.4%

Self-confident handling of stuttering

- Yes: 81.5%
- No: 18.5%

More participation in communication situations

- Yes: 81.5%
- No: 18.5%

Reduction of negative impact of stuttering on everyday life

- Yes: 74.5%
- No: 25.5%
Results – Improvement of psycho-social factors

Reciprocal conditionality of psycho social improvement

- Reduction of psychological strain
- Reduction of negative impact of stuttering on everyday life
- More participation in communication situations
- Selfconfident handling of stuttering

significant correlation between different aspects of psycho-social improvement.
Results – treatment outcome

Improvement of speech and psycho-social factors (n = 56)

- Improvement of speech and psycho-social factors (n = 56)
  - 75.0%
  - Improvement of speech (solely)
  - Improvement of psycho-social factors (solely)
  - No improvement

Inhibiting factors:
- Bad state of health
- Lack of motivation
- Irregular attendance of therapy sessions
significant improvement over the period of treatment:

- psycho-social improvement
- speech improvement
- better state of health

(p < 0.001)
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Conclusion

- Similar methods as in developmental stuttering therapy can be used
- Specific stuttering therapy is often supplemented by other approaches
- A combination of multiple speech techniques is most often used

- Easy onset
- Rhythmical speech
- Slowing speech rate

most frequently used techniques
Conclusion

- Demand: treatment has to be based on the patients` individual needs

### Practicing
- Learning and using an exact speech technique

### Transfer
- Supporting transfer into various speech situations

### Motivation
- Strengthening the patient`s motivation

- Improvement of speech and psycho-social factors in the majority of cases
Prospect

Research desideratum

Thank you very much for your attention!
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References


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Discussion

I`d be happy to send you the bibliography. Please feel free to contact me at my email address.