The Fluency Assessment Battery: Purpose, Validity and Methods

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8TH WORLD CONGRESS ON FLUENCY DISORDERS
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Lisbon, Portugal
Retelling Wallet story or Bus story

Prepared story telling

Spontaneous speech

Receptive & productive language tests

OMAS

Record and play back

writing

SPA-test
Fluency Assessment Battery

1. Predictive Cluttering Inventory - revised
2. Spontaneous speech
3. Retelling a story: Wallet story
4. Reading (3 times)
5. Oral Motor Assessment Scale
6. Brief Cluttering and Stuttering Questionnaire (BCSQ)
Predictive Cluttering Inventory – revised (PCI)

PCI : 33 items (Daly & Cantrell, 2006)

1. Pragmatics
2. Speech motor
3. Language & cognition
4. Motor coordination & writing problems

PCI-revised: 10 items are indicative of cluttering (Van Zaalen et al, 2009)
Analysis

1. Predicting Cluttering Inventory, revised.
2. Rate variation and pausing
3. Fluency, SSI-4
4. Sentence structure (grammatical encoding)
5. Word and syllable structure (phonological encoding)
6. Motor control
2. Rate and rate variation

- Speech rate
- Articulatory rate:

Production of sound segments in stretches of speech (no pauses).
- Calculated in syllables per second (SPS)
- Analyzing only perceptually fluent utterances
  (Hall, Amir, & Yairi, 1999; Pindzola et al., 1989).
Determining Mean Articulatory Rate (MAR)

10-20 consecutive syllables in fluent speech should be digitally analyzed.

5 AR / 5 = Mean Articulatory Rate
Peter: "It took some time that I realized myself"
# Articulatory Rate Form

## Form for Assessment of Articulatory Rate

<table>
<thead>
<tr>
<th>Name:</th>
<th>Date:</th>
<th>Age:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Spontaneous speech sample</th>
<th>Retelling</th>
<th>Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2.</td>
<td></td>
<td></td>
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<tr>
<td>3.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>4.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>5.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mean Articulatory Rate</th>
<th>Variation within speech condition</th>
<th>Variation between speech conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Normative Data

Articulatory Rate

<table>
<thead>
<tr>
<th>Mean Articulatory Rate (n=5)</th>
<th>Rate in Syllables per Second (SPS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>4.5 &lt; X &lt; 5.5</td>
</tr>
<tr>
<td>Children</td>
<td>&gt; 5.2</td>
</tr>
<tr>
<td>Adolescents</td>
<td>&gt; 5.6</td>
</tr>
<tr>
<td>Adults</td>
<td>&gt; 5.4</td>
</tr>
</tbody>
</table>

Articulatory rate variation

<table>
<thead>
<tr>
<th>Articulatory Rate Variation</th>
<th>SPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>1&lt; ARV &lt; 3.3</td>
</tr>
<tr>
<td>Abnormal variation</td>
<td>&gt; 3.3 within tasks</td>
</tr>
<tr>
<td></td>
<td>&lt; 1.0 between tasks</td>
</tr>
</tbody>
</table>

Yvonne Van Zaalen & Isabella Reichel 8TH
WORLD CONGRESS ON FLUENCY DISORDERS
Normal pauses 0.5 – 1.0 seconds

In PWC, pausing is:

- too short
- too often
- in linguistically “wrong” places

Pause “problems” in speech =>

a) Formulation of sentences or phonological encoding (formulator)
b) Initiation of speech (articulator)
Analysis

1. Predicting Cluttering Inventory, revised.
2. Rate, rate variation and pausing
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6. Motor control
Disfluency Analysis

Assessment Form: Percentage of Normal and Stuttering-like Disfluencies

<table>
<thead>
<tr>
<th>Name:</th>
<th>Date:</th>
<th>Age:</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Task: [ ] Spontaneous speech  [ ] Retelling  [ ] Reading

<table>
<thead>
<tr>
<th>Type</th>
<th>Number</th>
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</thead>
<tbody>
<tr>
<td>WR</td>
<td></td>
</tr>
<tr>
<td>pWR</td>
<td></td>
</tr>
<tr>
<td>PR</td>
<td></td>
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<tr>
<td>Int</td>
<td></td>
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<tr>
<td>Rev</td>
<td></td>
</tr>
<tr>
<td>NDF</td>
<td></td>
</tr>
<tr>
<td>tWR</td>
<td></td>
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<tr>
<td>PRO</td>
<td></td>
</tr>
<tr>
<td>Block</td>
<td></td>
</tr>
<tr>
<td>SDF</td>
<td></td>
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</tbody>
</table>

Comments on secondary behavior
- Visible:
- Auditory:
- Avoidance:

RATIO:
- NDF
- SDF
Normal disfluencies

Frequency of normal disfluencies

Controls & phonological cluttering: $M=9.7$ ; $Sd=2.6$

Stuttering: $M=5.0^*$

Syntactical cluttering: $\geq 2$ SD above the mean: $\geq 14.9$

*NDF

*N= 181; $p < .0005
Analysis

- Predicting Cluttering Inventory, revised.
- Rate & rate variation & pausing
- Fluency, SSI-4
- Sentence structure (grammatical encoding)
- Word and syllable structure (phonological encoding)
- Speech motor control
3. Wallet Story

• Retelling a memorized story
Story and sentence structure

Of the 13 main issues the client retold ... main issues (almost) completely.

Of the 9 side issues the client retold ... side issues (almost) completely.

The proportion of main issues to side issues is ... : ...

Total number of grammatically correct sentences: ...

Total number of sentences with the incorrect use of structure: ...

Mistakes in linguistics: ...

Mistakes in syntax: ...
4. Reading

• Rate (normal-fast-slow)

• HAF
Analysis

1. Predicting Cluttering Inventory, revised.
2. Rate & rate variation and pausing
3. Fluency, SSI-4
4. Sentence structure (grammatical encoding)
5. Word and syllable structure (phonological encoding)
6. Motor control
5. Word and Syllable Structure
Phonological Encoding

Accuracy, smooth flow and rate
1. At the syllable level: OMAS
2. At the word level: SPA
Screening Phonological Accuracy (SPA)

Words:


Accuracy - Smooth-flow-Rate

Van Zaanen-op't Hof, Wijnen and Dejonckere (2009)'A test of speech motor control on word level productions: The SPA Test (Dutch: Screening Pittige Articulatie)', International Journal of Speech-Language Pathology, 11:1, 26—33
To link to this Article: DOI: 10.1080/17549500802617689
URL: http://dx.doi.org/10.1080/17549500802617689
Analysis

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6. Oral Motor Assessment Scale

• Diadochokinetic tasks:
  • Puh-puh-puh
  • .......

• In cluttering there are no oral-motor difficulties
• In stuttering oral-motor difficulties can be presented
Available Languages

- English, Dutch, Swedish, Norwegian, German, French, Arabic, Polish, Bulgarian, Portuguese, Italian, Spanish, Finnish, Chinese, Indonesian, Nigerian, Russian.
Validity

• French (Aumont-Becand, Desportes & ...)
• Taiwan (Shu-Lan...)
• England (Howell, Cook & ...)
• USA (Reichel & van Zaalens)
• German (Schnell & van Zaalens)
Validation of a PCI-r and of the Fluency Assessment Battery in France

Véronique Aumont-Boucand, Emilie Desportes, Marie Meyer presented their data at the 2nd World Conference on Cluttering in July, 2014

Method
- Spontaneous speech
- Retelling a memorized story
- Oral Motor Assessment Screening
- Reading aloud
- Screening Phonological Accuracy
- Slow and fast copy
- Spontaneous writing with and without time constraint

Results
- 61 controls between 18 and 60 years old
- 33 PWC between 18 and 60 years old
Conclusion

The PCI-r allows to identify the cluttering characteristics in France.

The Fluency Assessment Battery confirms the hypothesis of cluttering by the overall patient profile’s analysis.

It also allows to differentiate the phonological cluttering from the syntactic cluttering.

Aumont-Boucand, Desportes, Meyer, 2014