Scenario Test
Overall communication in severe aphasia

Ineke van der Meulen
Mieke van de Sandt-Koenderman
Aphasia Team

Rijndam Rehabilitation Center
Erasmus MC: Dept of Rehabilitation Medicine
AAC: Augmentative & Alternative Communication

- Gesturing, pointing
- Mimic
- Drawing
- Writing
- Written choice conversation
- Communication aid
  - Personal booksystem
  - Computer system (TouchSpeak)
AAC success?
Tools assessing functional communication

• CADL: Communicative Activities in Daily Living. Holland, 1980 & Holland, 1999
• CETI: Communicative Effectiveness Index. Lomas et al, 1989
• Communication Profile: observations
• ANELT: Amsterdam Nijmegen Everyday Language Test
Overall communication: verbal + nonverbal

Goal:
To develop a test that measures a patient’s ability to use supportive strategies in conveying information in every day life situations

Focus:
People with severe aphasia
ANELT-example

We are in a shop. You want to buy a new television. I am the shop assistant.
Can I help you, sir?

Patient’s task:
To produce a monologue
Scenario Test
formerly known as Rijndam Scenario Test (RIJST)

6 everyday life scenarios, e.g. doctor, restaurant
3 items each

Verbal and nonverbal communication allowed
Scenario: the doctor
You are visiting your doctor, because you’ve had a bad cough for weeks. The doctor asks: How can I help?
The doctor tells you to return next week, for a check-up. You go to the reception to make the appointment.
You go to the pharmacy to pick up your prescription: a cough syrup. There is a problem: you get pills instead of syrup.
Scenario: restaurant
You are in a restaurant, having a drink with friends. You need to go to the toilet, but you don’t know where it is. How do you ask the waiter?
You would like to see the menu. How do you ask for it?
The waiter brings your soup. But you have no spoon. What do you do?
Supportive strategies in aphasic communication

- Gesturing, pointing
- Mimic
- Drawing
- Writing
- Communication aid

Non-aphasic communication partner
ANELT
Amsterdam Nijmegen Everyday Language Test (Blomert 1995)

- every day life scenarios
- verbal communication: speaking
- monologue

Scenario Test
Scenario Test (NL 2008)

- every day life scenarios
- Overall communication: speaking, writing, gesturing, drawing, pointing…etc
- dialogue: supportive partner
Structured dialogue

No information:
1. Prompting to switch the communicative mode
2. Asking yes/no questions

Partial information:
1. Asking open questions
2. Asking yes/no questions
Scoring

3 pts: information complete, no support

2 pts: information complete, some support

1 pts: yes/no questions
       information complete

0 pts: no information, yes/no inadequate
Reliability and Validity study

**Aphasia N=130**
Scenario Test

- ANELT
- AAT interview
- CETI
- Comprehension

**Normal N=25**
Scenario Test

---

**40 pts: acute**
1x acute
1x at 6 MPO

**25 pts: chronic**
1x
1x after 2 wks

**65 1 x**
• Construct validity: ANELT, AAT interview & CETI
• Differential validity:
  – Aphasia-no aphasia
  – severe aphasia (nonverbal) – moderate/mild aphasia (verbal)
• Responsivity
• Test-retest reliability
• Interjudge reliability
• Intrajudge reliability
## Reliability-1

### Interjudge (N=79) & intrajudge (N=4x5) reliability

Intraclass correlation coefficient (ICC)

<table>
<thead>
<tr>
<th>judge</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.96</td>
<td>1.0</td>
<td>.89</td>
<td>.94</td>
<td>.99</td>
<td>.99</td>
<td>.99</td>
<td>.99</td>
<td>.99</td>
<td>.99</td>
<td>.99</td>
</tr>
<tr>
<td>4</td>
<td>.99</td>
<td>.99</td>
<td>.99</td>
<td>.96</td>
<td>.96</td>
<td>.96</td>
<td>.96</td>
<td>.96</td>
<td>.96</td>
<td>.96</td>
<td>.96</td>
</tr>
</tbody>
</table>

Interjudge ICC totaal: .97
Reliability-2

Test-retest reliability (N=20)

R = .97, p< 0.01
Validity-1
Construct validity

correlation with other aphasia tests

Scenario Test – ANTAT (N=115)        r=.85, p<0.01
Scenario Test – CETI (N=71)          r=.40, p<0.01
Scenario Test – AAT interview (N=118) r=.81, p<0.01
### Validity-2

**Differential validity**

aphasia versus no aphasia
severe versus moderate-mild aphasia (verbal vs nonverbal)

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>Mean score (0-54)</th>
<th>sd</th>
<th>z (Mann-Whitney U)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Non-aphasic</strong></td>
<td>25</td>
<td>53.2</td>
<td>0.9</td>
<td>-6.6</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td><strong>Aphasic</strong></td>
<td>122</td>
<td>39.5</td>
<td>13.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Nonverbal</strong></td>
<td>43</td>
<td>26.5</td>
<td>12.5</td>
<td>-7.9</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td><strong>Verbal</strong></td>
<td>72</td>
<td>47.5</td>
<td>7.1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Responsivity

Mean score acute: 38.7 (SD 15.3)
Mean score at 6 MPO: 47.7 (sd=10.4).
(t=-4.96; p<0.001)
Conclusion: reliable and valid instrument

- high stability over time
- high agreement in scoring
- good concurrent validity, differential validity
- good responsivity
Clinical usefulness
Overall scores
8 “nonverbal” participants

Variation in Scenario Test scores
Three communication profiles

No use of nonverbal communication strategies, communicative support has no effect.

1 alternative strategy. Success depending on strategy.

Several alternative strategies used, some support needed.
Communication profiles

These profiles are not new.

What is new is that communication type can be *systematically assessed* in a *short* period of time (± 30 minutes).

The Scenario Test also enables us to *measure changes* in the communicative abilities.
<table>
<thead>
<tr>
<th>Patient</th>
<th>First assessment</th>
<th>Second assessment</th>
<th>% change of possible change*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7</td>
<td>15</td>
<td>17.0</td>
</tr>
<tr>
<td>2</td>
<td>7</td>
<td>28</td>
<td>44.7</td>
</tr>
<tr>
<td>3</td>
<td>19</td>
<td>48</td>
<td>82.9</td>
</tr>
<tr>
<td>4</td>
<td>20</td>
<td>29</td>
<td>26.5</td>
</tr>
<tr>
<td>5</td>
<td>22</td>
<td>44</td>
<td>68.8</td>
</tr>
<tr>
<td>6</td>
<td>25</td>
<td>51</td>
<td>89.7</td>
</tr>
<tr>
<td>7</td>
<td>27</td>
<td>43</td>
<td>59.3</td>
</tr>
<tr>
<td>8</td>
<td>43</td>
<td>53</td>
<td>90.9</td>
</tr>
<tr>
<td>9</td>
<td>44</td>
<td>48</td>
<td>40.0</td>
</tr>
<tr>
<td>10</td>
<td>44</td>
<td>53</td>
<td>90.0</td>
</tr>
<tr>
<td>11</td>
<td>45</td>
<td>53</td>
<td>88.9</td>
</tr>
<tr>
<td>12</td>
<td>45</td>
<td>52</td>
<td>77.8</td>
</tr>
<tr>
<td>13</td>
<td>46</td>
<td>53</td>
<td>87.5</td>
</tr>
<tr>
<td>14</td>
<td>48</td>
<td>52</td>
<td>66.7</td>
</tr>
<tr>
<td>15</td>
<td>49</td>
<td>52</td>
<td>60.0</td>
</tr>
<tr>
<td>16</td>
<td>49</td>
<td>53</td>
<td>80.0</td>
</tr>
<tr>
<td>17</td>
<td>50</td>
<td>54</td>
<td>100</td>
</tr>
<tr>
<td>18</td>
<td>52</td>
<td>53</td>
<td>50.0</td>
</tr>
<tr>
<td>19</td>
<td>52</td>
<td>53</td>
<td>50.0</td>
</tr>
<tr>
<td>20</td>
<td>52</td>
<td>54</td>
<td>100</td>
</tr>
<tr>
<td>21</td>
<td>52</td>
<td>54</td>
<td>100</td>
</tr>
<tr>
<td>22</td>
<td>54</td>
<td>54</td>
<td>0.0</td>
</tr>
</tbody>
</table>
Effect studies, eg TouchSpeak

• Generalisation to overall communication?
TouchSpeak: TS-Software for handheld computers & PC

HP Jornada

Siemens Simpad

HP iPAQ

Q-Tek
TouchSpeak
Personalised Hierarchical Vocabulary
Level 2: Choice: “How do you feel?”
Level 3:
Choice: unwell

I do not feel well
Level 3: 
Choice: Dr Gerritze

Please call dr Gerritze
Scenario Test

* Wilcoxon: p < .03

* Wilcoxon: ns

N=13
Danke für Ihre Aufmerksamkeit!

Financial support:
Stichting Kinderfonds Adriaanstichting
Johanna Kinderfonds
Questions?
Fragen?!
Effect studies, eg Gesture Training

• Generalisation to untrained gestures?
• Generalisation to communication in natural settings?
Design

Multiple baseline single subject study

Baseline | Training: 10 sessions | No training
---|---|---
GT | GT | 6 weeks
GT | GT | GT | GT

Scenario Test control tasks | Scenario Test control tasks | Follow up

Gesture task contains 24 pictures: 12 trained and 12 untrained gestures. Untrained gestures are matched with the trained in terms of semantics and complexity of hand figuration.
Gesture training

Material

12 gestures that can be used in the Scenario Test to convey information

CAR

MAKE AN APPOINTMENT
Gesture training: results

Case 1: Mr. JH (60)

L-CVA, severe aphasia, moderate ideomotor apraxia
Time post onset: > 2 years

No verbal communication. Stereotypical gestures.
Results JH

Trained and untrained gestures

Improvement (42%) on trained gestures
No improvement (8%) on untrained gestures

improvement: \[
\frac{\text{obtained improvement (final-mean baseline)}}{\text{possible improvement (12-mean baseline)}} \times 100
\]
Results JH

Overall communication

After training, JH uses 40% of the acquired gestures to convey information in the Scenario Test. He also tries to make other trained gestures, but does not succeed due to his apraxia.

Small improvement (17%)
Gesture training: results

Case 2: Mr. BD (61)

L-CVA, severe aphasia, mild ideomotor apraxia, apraxia of speech
Time post onset: 8 months

No verbal communication.
Mainly unintelligible speech, occasionally an adequate word.
No spontaneous use of gestures.
Uses pointing book, but searching the correct word takes very long.
Trained and untrained gestures

Improvement (65%) on trained gestures
Also, but smaller (38%) and later improvement on untrained gestures

Generalisation to untrained gestures
Results BD

Overall communication

BD correctly uses all acquired gestures in the Scenario Test. He also produces other gestures and relies less on his pointing book.

His score on the Scenario Test improves (39%) and reactions are much faster.
Gesture training: results

Case 3: Mr. HD (55)

L-CVA, severe aphasia, severe ideomotor apraxia
Time post onset: > 6 years

No verbal communication.
Uses mainly drawing to communicate.
Stereotypical gestures, occasionally an adequate gesture.
Results HD

Trained and untrained gestures

Improvement (80 %) on trained gestures
No improvement on untrained gestures
Results HD

Overall communication

HD correctly uses 25% of the acquired gestures in conveying information in the Scenario Test. He also tries to make other, untrained gestures, but is not always successful.

His score on the Scenario Test improves (21%)
## Summary

<table>
<thead>
<tr>
<th>patient</th>
<th>improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>trained gestures</td>
</tr>
<tr>
<td>JH</td>
<td>√ (42%)</td>
</tr>
<tr>
<td>BD</td>
<td>√ (65%)</td>
</tr>
<tr>
<td>HD</td>
<td>√ (80%)</td>
</tr>
</tbody>
</table>