Automatic discourse analysis in aphasia

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Introduction

- People with aphasia (PWA) experience difficulties in daily communication.
- Language disordered can affect different levels of linguistic processing.
- It is important to measure their spared linguistic skills with a thorough method that takes into account all linguistic levels.
- Recent interest towards discourse (spontaneous speech).
- Evidence shows that spontaneous speech can provide more information than classical standardized tests for aphasia.
- Need of automation for analysis to guarantee replicability and precision for future studies.
- AphasiaBank: international shared database about spontaneous speech in persons with aphasia (Marini et al., 2011).

Purpose

- To contribute to AphasiaBank with data from Italian speaking PWA.
- To assess the linguistic skills of a group of persons with fluent aphasia in spontaneous speech with a multi-level approach (Marini et al., 2011).
- Check the clinical implications of the discourse resolution by correlating spontaneous speech measures with measures from a classical standardized test for aphasia: AAT Aphasiology Test (Luzzatti et al., 1991).

Materials and Methods

PARTICIPANTS
- 11 people with fluent aphasia.
- Italian native speakers.
- Mean age: 64.72 (st.dev. = 9.24).
- Neurological stability.

MATERIALS
- AphasiaBank protocol (free speech samples, picture descriptions, story retelling, procedural discourse, verb-filling tests).
- Three extra pictures for storytelling (one single picture, two cartoon stories).

METHODS
- Videorecordings of conversations.
- Transcriptions with OATM format (Codes for the Human Analysis of Transcripts, MacWhinney, 2000).

Data analysis

1. Automatic analysis with CLAN (Computerized Language Analysis).
   - (MacWhinney, 2000).

2. Discourse analysis focusing on four main aspects of linguistic processing: (Marini et al., 2011).

   - PRODUCTIVITY
   - MICRO-LINGUISTIC ANALYSIS
   - NARRATIVE ORGANIZATION
   - MACRO-LINGUISTIC ANALYSIS

   - INFORMATIVENESS

   - Table 1: Pearson's values.

   - Table 2: Selected results of correlations between AAT subtests and discourse measures.

   - Table 3: Graphical representation of Pearson's values for selected discourse and linguistic variables.

   - Table 4: Pearson's values.

   - Table 5: Graphical representation of Pearson's values for selected discourse and linguistic variables.

Results

Selected results of correlations between AAT subtests and discourse measures.

Conclusions

- Discourse analysis provides information about PWA’s linguistic skills that we don’t find in AAT.
- Discourse analysis has a remarkable value even in a theoretical framework, providing researchers and clinicians a window to observe how the linguistic levels interact on the bases of quantitative and pragmatic measures.
- Correlations with a classical standardized test confirmed the validity of spontaneous speech assessment.
- In the future we need to implement the Italian sample for AphasiaBank.

References