ABILITÀ NARRATIVE NEI BAMBINI CON DSL IN ETÀ PRESCOLARE: UN’ANALISI DEI COMPORTAMENTI LINGUISTICI E NON-VERBALI NEI COMPITI DI RETELLING

Narrative abilities in preschoolers with (Specific) Language Impairment: analysis of verbal and non-verbal behaviours during story retelling

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RESEARCH OBJECTIVES

• Assessment of narrative skills

• Sample: preschooler with (Specific) Language Impairment

• Multidimensional analysis of verbal and non-verbal behaviours (i.e. gesture, gaze, mimic)

• Evaluation of the «medium»: paper book vs. tablet
Specific Language Impairment, SLI [ICD-10/DSM IV]: a condition of delayed or disordered language acquisition which occurs in children with otherwise normal development

- developmental disorder with unknown aetiology
- characterized by language delay in children with otherwise normal physical, intellectual and cognitive development (children diagnosed with SLI do not usually present any additional hearing problems, frank neurological deficits, or severe emotional disorders)
- not a homogenous condition: different disturbances in language processing, depending on:
  - linguistic level (phonetic, phonological, morphological, syntactic, semantic, or even pragmatic)
  - modality of language use (linguistic comprehension vs. production)

Only few children show such a pure profile [Leonard, 2014]: subtle nonlinguistic processing weaknesses exist alongside the more obvious language lags

- DSM-5: “Communication Disorders” > Language Disorder, Speech and Sound Disorders, Social (Pragmatic) Communication Disorder
- CATALISE [Bishop, 2017]: “DLD - Developmental Language Disorder”
- “Primary Language Impairment” [Kohnert, Windsor, & Ebert, 2008]
NARRATIVE SKILLS

- **Oral narrative skills**, “children’s ability to retell relevant information about a story”
  - Index of “structural” linguistic competence
  - **milestones** of child development: logical thinking and verbal reasoning

- Clinical practice:
  - Only few standardized test
  - Speech and language therapy usually shows low impact on this level

- **Consequences on adult life**:
  - predictors of literacy problems and future academic success
  - heavy impact on social-relational functioning
SAMPLE

- 16 monolingual infants (13 M; 3 F)
- ranging in age from 4;2 to 5;4

<table>
<thead>
<tr>
<th>DL Group</th>
<th>Control group</th>
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</thead>
</table>
| n= 8 (M) children:  
  • met the criteria for DL with expressive deficits  
  • recruited at the AUSL Centro Toscana  
  • underwent a speech-language treatment before the study | n= 8 (5M, 3 F) children without speech, language, hearing or cognitive impairments  
  (as reported by their parents and confirmed by neuropsychological assessment). |
METHODOLOGY

3 task:

- norm-referenced evaluation: *Bus Story test* [Renfrew, 2015]
- semi-spontaneous retelling assessment:
  - retelling of the “three little pigs” story, through paper book
  - retelling of the short film called “little polar bear” (100 sec.), through tablet
SOME EXAMPLES

- Control
- DL (1)
- DL (2)
METHODOLOGY

• Video recording of the sessions (using a tablet or a smartphone, placed in front of the subject)

• Orthographical transcription (using ELAN)

• Manual annotation of linguistic aspects (i.e. lexical, morpho-syntactic, narrative and pragmatic cues) and non-verbal behaviors

• Statistical analysis (non parametrical test: Kolmogorov-Smirnov, Kruscall-Wallis, $\chi^2$)
CHAT-LABLITA diacritics for the annotation of prosodic structure [MacWhinney, 1991; Moneglia, 2005]

**Prosodic break:** perceptively relevant prosodic variation in the speech continuum such as to cause the parsing of the continuum into discrete prosodic units.

| **Terminal:** a competent speaker assigns to it the quality of concluding the sequence | // |
| **Non terminal:** a competent speaker assigns to it the quality of being non conclusive | / |

**Unintentionally interrupted sequences:** the speaker’s program is broken and the interpretability of the sequence can be compromised

| **Pause** | # |

es. Mentre # il paratore lo stava riparando / # lui decide di scappare //
## FEATURES CONSIDERED IN THE STUDY

### FLUENCY
- Total Locution Time – TLT
- Total Phonation Time – TPT
- Number of false starts
- Number of empty/filled pauses
- Duration and % of pauses
- Verbal Rate
- Standardized Phonation Time [Singh et al. 2001; Roark et al., 2011]
- Standardized Pause Rate [Singh et al. 2001; Roark et al., 2011]

### LEXICAL AND MORPHO-SYNTACTIC CUES
- Number of words, utterances and turns
- Words/turns ratio
- Number of clauses / verbless utterances / interrupted sequences
- Number and % of main clauses / coordinate clauses / subordinate clauses
- Number and correctness of clitic pronouns
- Consistency of verbal tenses
- Number of Morpho-syntactic errors (e.g. bound morphemes substitution, unbound morphemes omission/substitution/addition, agreement errors)
- TTR: type/token ratio
- MLU: Mean Length of Utterance

### NON VERBAL SKILLS
- Number of Gesture related (cohesive, deictic, icon gesture) and not related to speech (Hetero-adapters and self-adapters )
- Mimic
- Eye contact

### NARRATIVE ABILITIES
- Story schema
**RESULTS: FLUENCY**

*Narrations of DL children is ipofluent*, especially during non-standardized test (3 little pigs and Little Polar Bear): verbal rate, St. pause rate, % of pauses

\[ p < .05 \]
RESULTS: FLUENCY (2)

3 little pigs ~ Little Polar Bear:
- narrations elicited by using digital support is less fluent

\[
p < .05
\]
LEXICAL AND MORPHO-SYNTACTIC CUES: TYPOLOGY AND SYNTACTIC STRUCTURE OF UTTERANCES

<table>
<thead>
<tr>
<th></th>
<th>Interrupted sequences</th>
<th>Verbless</th>
<th>Clause</th>
</tr>
</thead>
<tbody>
<tr>
<td>DL</td>
<td>15,07%</td>
<td>29,93%</td>
<td>54,98%</td>
</tr>
<tr>
<td>CONTROL GROUP</td>
<td>4,75%</td>
<td>30,09%</td>
<td>65,15%</td>
</tr>
</tbody>
</table>

DL children: higher percentage of interrupted sequences!

\[ p < .000 \]
**LEXICAL AND MORPHO-SYNTACTIC CUES: TYPOLOGY AND SYNTACTIC STRUCTURE OF UTTERANCES**

<table>
<thead>
<tr>
<th></th>
<th>Main Clauses</th>
<th>Coordinate Clauses</th>
<th>Subordinate Clauses</th>
</tr>
</thead>
<tbody>
<tr>
<td>DL</td>
<td>59.13%</td>
<td>28.98%</td>
<td>11.88%</td>
</tr>
<tr>
<td>CONTROL GROUP</td>
<td>45.28%</td>
<td>40.69%</td>
<td>14.02%</td>
</tr>
</tbody>
</table>

DL children: less complex sentences!

$p < .000$

Deficient planning ability?
LEXICAL AND MORPHO-SYNTACTIC CUES: CLITICS

- Although the observed differences do not reach statistical significance clitic pronouns are confirmed to be a clinical Marker of DL in Italian, even after logopedic treatment.
LEXICAL AND MORPHO-SYNTACTIC CUES: CONSISTENCY OF VERBAL TENSES

- Use of the **past tense**: creating a **distance from the here and now** [Brandi, 2002]
- **Consistency** in the use of verbal tense: **ability to continuously maintain the focus on one task for a prolonged period**

<table>
<thead>
<tr>
<th>BUS STORY TEST</th>
<th>3 LITTLE PIGS</th>
<th>LITTLE POLAR BEAR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>DL</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>CONTROL GROUP</td>
<td>7</td>
<td>1</td>
</tr>
</tbody>
</table>

\( p > .05 \)

- All the children are able to use the past tense
- **But no coherence!**
### STORY SCHEMA: 3 LITTLE PIGS

<table>
<thead>
<tr>
<th>SETTING</th>
<th>EPISODE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Characters</strong></td>
<td><strong>Initiating event</strong></td>
</tr>
<tr>
<td>DL</td>
<td>7/8</td>
</tr>
<tr>
<td>CONTROL GROUP</td>
<td>6/8</td>
</tr>
</tbody>
</table>

**No statistical difference** between the groups (p > .05)

Narrations can be classified as **Sequences** or **Primitive Narrations**
### Story Schema: Little Polar Bear

<table>
<thead>
<tr>
<th>SETTING</th>
<th>EPISODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Characters</td>
<td>Place</td>
</tr>
<tr>
<td>DL</td>
<td>8</td>
</tr>
<tr>
<td>CONTROL GROUP</td>
<td>6</td>
</tr>
</tbody>
</table>

**No statistical difference** between the groups (p > .05)

Narrations can be classified as «Heaps»

Retelling seems to be very poor and laborious, also for typical children.

The plot of the story is very simple: **Influence of the Medium?**
• DL children produced more gesture not related to speech (Hetero-adapters and self-adapters)
NON VERBAL BEHAVIOUR: GESTURE

- **Control group**: more icon gesture than DL children (e.g. wolf blowing)
- **DL** children: more deictic gesture

![Graphs showing comparison of gesture types between control and DL groups]

- Different functions of deictic gestures:
  referential vs. direction of interlocutors' attention
CONCLUSIONS

• DL children show persistent difficulties and discomfort during retelling tasks.
  Main cues:
  • Fluency
  • Morpho-syntactic point of view
  • Non-verbal behavior

• worse performance on Little Polar Bear: **INFLUENCE of the MEDIUM**
  • The plot is very simple
  • No prior knowledge of 3 Little Pigs Story!
CONCLUSIONS

• Reaffirm the **importance of book reading activities** in home environment

• **Other cognitive domains involved** (not considered in this study)?
  • Procedural memory
  • Executive functions (attention and planning)
  • ToM – Theory of Mind
REFERENCES