Computerized system for the screening of Specific learning and language disorders within bilingual children

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Background
- with an increasing number of bilingual children, education and health care professionals take risks of misdiagnosis (under-/overdiagnosis) of developmental language disorders (DLD) and developmental dyslexia (DD)
- need for methods and trained professionals to distinguish poor language proficiency due to bilingualism from DLD/DD
- need to define markers to identify the risk of DLD/DD in bilingual children possible implementation solutions:
  - bilingual assessments through bilingual SLPs (rare)
  - language-universal assessment (never truly language-universal)
  - language specific assessment with automatized analysis

Objective: language specific screening batteries with automatized analysis
- selection of languages (representative of language families, linguistic communities in Italy)
- selection of language-specific clinical markers (considering amount of exposure)
- design of corresponding screening tasks
- implementation into a computerized screening and evaluation system
- administration to typically developing (TD) bilingual children
- evaluation of the tests and the system, definition of the final version
- administration to bilingual children with DLD/DD
- analysis of the discriminating power of the screening tests (specificity and sensitivity)

<table>
<thead>
<tr>
<th>Developmental Language Disorder (DLD)</th>
<th>English-Italian</th>
<th>Spanish-Italian</th>
<th>Italian-German</th>
<th>Mandarin/Wenzhounese-Italian</th>
</tr>
</thead>
<tbody>
<tr>
<td>phonology</td>
<td>nonword-repetition tasks (NWRT)</td>
<td>rhyme/onset/tone detection</td>
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<tr>
<td>morphology/syntax</td>
<td>L1 (past) tense marking</td>
<td>verb morphology (3rd pers. pl., finiteness); direct object clitics</td>
<td>L1 verb morphology; clitics</td>
<td>L1 aspect marking; negation</td>
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<tr>
<td>L2 article-noun-agreement</td>
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<td>lexicon</td>
<td></td>
<td>conceptual vocabulary store (especially verb knowledge); (receptive) picture-matching tasks (see e.g. CLTs)</td>
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<tr>
<td>reading</td>
<td>syllable, word, nonword &amp; sentence reading speed &amp; accuracy</td>
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<tr>
<td>metaphorology</td>
<td>rhyme/tone/accen detection, phonological blending, syllabic inversion</td>
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<tr>
<td>others</td>
<td>RAN digits; dynamic reading assessment; neuropsychological/linguistic skills</td>
<td>visual attention</td>
<td>character analysis</td>
<td></td>
</tr>
</tbody>
</table>

Outlook
Implementing language-specific and quasi-universal (dynamic assessment, visual/auditory skills) tasks, we will walk a thin line between the most promising and the most applicable paradigms. Integrating recent research findings and merging them with user-friendly soft- and hardware, the outcomes have important economic as well as non-economic implications for health and education services across Europe.


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