Assessing Arabic Metalinguistic Awareness of Educators in Saudi Arabia: An Instrument Validity Using Rasch Modelling

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1. BACKGROUND

Metalinguistic awareness: refers to the conscious ability to think and reflect upon, understand, and manipulate the structural elements of written and spoken language (Ehri, 2005). Metalinguistic knowledge includes: morphological awareness, phonological awareness and orthographic knowledge, which have been deemed to underpin reading development (Apel & Masterson, 2001). Arab metalinguistics have been found to be a significant predictor of reading achievement independent of nonverbal skills, vocabulary, and word reading skills (Tibi & Kirby, 2019). The acquisition of reading comprehension is achieved via decoding and language comprehension, both of which have been shown to be underpinned by direct and shared effects of metalinguistic awareness (Apel & Masterson, 2001).

Explicit knowledge of metalinguistics: the increase in teachers’ knowledge of metalinguistics, leads to gains in students’ achievements; however, little is known about this effect in the Arabic language. English language studies indicate that teachers are found to possess implicit knowledge related to basic language constructs (e.g. the ability to identify a grammatical or spelling error within a student’s work), but they frequently lack the required explicit knowledge to articulate the rationale behind these constructs (i.e. to explicitly teach the grammatical rule or orthographic pattern which underlies the implicitly detected grammatical or spelling error) (Binks-Cantrell et al., 2012; Washburn et al., 2011).

This project will allow for an evaluation and validation of Arab teachers’ metalinguistic knowledge.

2. Objective

- This study set out to develop and validate a comprehensive questionnaire of metalinguistic knowledge of Arabic.
- Use the developed survey to assess the current metalinguistic knowledge of Arabic speaking teachers, special needs teachers, preservice teachers and lecturers in higher education across Saudi Arabia.

3. Participants

15 educators in the initial pilot
221 educators from across Saudi Arabia
All participants’ native language was Arabic.
General primary classroom teachers (39%)
Primary special education teachers (28.1%)
Pre-service teachers (16.7%)
University lecturers (11%)
Other educators (2.2%).

4. MEASURES

1) Background
Demographics: gender, educational background, years of experience in teaching, occupational type, and ways of accessing continuing education

2) Teachers’ metalinguistic knowledge
59 questions representing the three metalinguistic subcomponents (phonological awareness, morphological awareness, and orthographic awareness)

5. RESULTS

Summary statistics for item and person levels of metalinguistic knowledge:

<table>
<thead>
<tr>
<th>Measure</th>
<th>Person Mean</th>
<th>Person SD</th>
<th>Person MNSQ</th>
<th>Person Separation</th>
<th>Person ZSTD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>1.1</td>
<td>0.39</td>
<td>1.51</td>
<td>1.94</td>
<td>0.90</td>
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<tr>
<td>SD</td>
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<td>0.12</td>
<td>1.05</td>
<td>1.26</td>
<td>0.09</td>
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<tr>
<td>MNSQ</td>
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<td>0.96</td>
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<tr>
<td>Separation</td>
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<td>1.54</td>
<td>1.27</td>
<td>1.50</td>
<td>1.02</td>
</tr>
<tr>
<td>ZSTD</td>
<td>0.03</td>
<td>0.02</td>
<td>0.03</td>
<td>0.02</td>
<td>0.03</td>
</tr>
</tbody>
</table>

Summary statistics for item measures of metalinguistic knowledge:

<table>
<thead>
<tr>
<th>Measure</th>
<th>Item Mean</th>
<th>Item SD</th>
<th>Item MNSQ</th>
<th>Item Separation</th>
<th>Item ZSTD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
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<td>0.44</td>
<td>1.66</td>
<td>2.05</td>
<td>1.21</td>
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<tr>
<td>SD</td>
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<td>0.64</td>
<td>1.37</td>
<td>1.51</td>
<td>0.90</td>
</tr>
<tr>
<td>MNSQ</td>
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<td>0.52</td>
<td>0.80</td>
<td>1.03</td>
<td>1.54</td>
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<tr>
<td>Separation</td>
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<td>1.51</td>
<td>1.21</td>
<td>0.52</td>
</tr>
<tr>
<td>ZSTD</td>
<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
<td>0.00</td>
<td>0.02</td>
</tr>
</tbody>
</table>

Rasch model analyses
used to inspect: (1) the overall fit of the data including analysis at the item and person level
(2) Question redundancy, through analysis of the Wright Map, to aid in the reduction of questions to produce a shorter high-quality assessment
(3) The relative difficulty of the metalinguistic knowledge assessment items within the Rasch model

Priming assessment results
Item fit, no items were found to exceed a range of 0.5 to 1.5
Person fit, 5 participants removed as result of off-dimension behaviour, and one more for presenting an outfit of MNSQ slightly greater than 1.5
Person-Item/Wright maps. 12 items were eventually removed after an examination of their fit statistics and the theoretical relevance of all overlapping items

5. FINDINGS/CONCLUSIONS

- The initial 47 questions related to metalinguistic knowledge were reduced to 28 meaningful validated questions that tap each of the three metalinguistic skills.
- Wright map evaluation reveals that the item-mean difficulty (0 logits) is greater than the person ability means (~0.53 logits). The difference between person ability and item difficulty indicates that the metalinguistic knowledge tasks are in general slightly difficult for the average teacher from Saudi Arabia.
- Out of 28 possible metalinguistic knowledge tasks items, an average teacher participant could correctly answer 11 items.
- None of the original 47 items was found to misfit. Meanwhile, 6 of the 221 participants were found to misfit, meaning that their performance on the metalinguistic assessment was not consistent with what would be expected by their ability level as determined by the typical pattern of teachers included in the model.

Finally, this identification of specific aspects and domains of difficulty will help inform the design of new professional development programmes that could serve as a means of targeting these identified metalinguistic knowledge gaps among Saudi Arabian educators.

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