Phonological awareness: “necessary” prerequisite for the successful acquisition of literacy?

Rüdiger-Philipp Rackwitz
University of Education
Schwäbisch Gmünd
Germany

1) phonological awareness - overview

2) re-analysis of data collected to norm a test for phonological awareness

3) conclusion and perspectives
phonological awareness - overview

- considered to be one of the strongest and reliable predictors of future reading and spelling abilities in grade one and beyond

"A student’s level of phonological awareness at the end of kindergarten is one of the strongest predictors of future reading success, in grade one and beyond."


- therefore should be well developed at the beginning of learning to read and spell in school (Really?)

phonological awareness - overview

awareness
- that spoken language consists of sounds
- that spoken language can be segmented into words, syllables, and phonemes
- that words can rhyme

ability
- to detect syllables, onsets, rhymes, phonemes
- to manipulate them by segmenting, blending, deleting, substituting
phonological awareness - overview

typical tasks and skills are
- identifying/producing words that rhyme
- identifying words that start/end with the same phoneme
- identifying the first/middle/ending phoneme of a word
- segmenting sentences into words => syllables => phonemes
- blending of phonemes into => syllables => into words
- deleting/substituting syllables and phonemes from words
- adding, deleting, substituting phonemes in words

several standardized tests were designed to measure phonological awareness in kindergarten and primary school
phonological awareness - overview

- several training programmes to support the development of phonological awareness in kindergarten and primary school

- "strong" predictor of future reading and spelling abilities
  - correlation studies showed positive and statistically significant correlations between phonological awareness and reading and spelling abilities
  - (quasi-)experimental training studies showed impact of phonological awareness to reading and spelling abilities

(Einsiedler, Frank, Kirschhock, Martschinke & Treinies 2002; Walter 2002; Marx, Weber, Schneider 2005; Steinbrink 2006)
phonological awareness - overview

On the other side...

- recently several studies that question the role of phonological awareness as a strong predictor:
  - re-analyses of the Bielefelder Screening (Jansen et al. 1999) by Brügelmann (2003; 2005) and Marx & Weber (2006) could not replicate the prognostic validity of the BISC
  - several (quasi-)experimental studies showed no significant influence of phonological awareness to reading and spelling abilities of 1st graders and beyond (May & Okwumo 1999; Roos et al., 2007, Rothe 2008; Franzkowiak 2008; Rackwitz 2009)

Phonological awareness:

- necessary prerequisite skill
- strong predictor

of reading and spelling abilities
study: re-analyses


- group test for early recognition of reading and spelling problems
- measuring phonological awareness
  - of children in Kindergarten
  - of 1st graders at the beginning of school

---

test - overview

**phonA in a wider sense**

- identifying rhymes
  - Tisch/ Fisch/ Hut
- segmenting into syllables
- length of word

**phonA in a narrower sense**

- phoneme matching
  - "Which words begin with the same sound?"
- synthesis
  - ("Sch-uh")
- identifying of last phoneme
test statistics - overview

N = 474 children of 1st grade incl. N = 46 (9.70%)
- to norm the test children with other mother tongue
- for validation than German

6 tasks
- 10 points each
- maximum score 60 points

whole sample
M = 44.38; SD = 9.49

predictive validity

at the end of 1st grade
- spelling test DBL1 (Dummer-Smoch 1993)

N = 450 children
- N = 41 (9.10%)
children with other mother tongue

spelling of 24 words

words spelled correctly
M = 16.08; SD = 4.98
predictive validity

phon awareness
* spelling test

$r = .545; \ p < .000$

explained variance

$r^2 = .297$
$\Rightarrow 29.70\%$

unexplained variance

70.30\%
**predictive validity**

r = .545**

- explained variance 29.70%

- similar to results in other correlation studies

- considered to be a strong correlation and a large effect size

- qualitative decision

- in educational psychology there are hardly any higher correlations to find in field studies


---

**predictive validity**

How precisely can children with later spelling difficulties be identified by the test?

**Defining the cut-off point for children at risk**

Mean – 1 x SD = cut-off point

\[ M - 1 \times SD = \text{cut-off point} \]

\[ M = \text{Mean} \]

\[ SD = \text{Standard Deviation} \]

M = ?

SD = ?

- qualitative decision
predictive validity

cut-off point for phonological awareness test

- all children in whole sample (N = 474) => cut-off point \( \leq 34 \) pts
- children with German mother tongue in whole sample (N = 428) => cut-off point \( \leq 36 \) pts => Barth/ Gomm
- children with German mother tongue (N = 409) who took part in the spelling test => cut-off point \( \leq 36 \) pts
- children who took part in the spelling test (N = 450) => cut-off point \( \leq 35 \) pts

\[
\begin{align*}
M &= 45.25 \\
SD &= 8.74 \\
N &= 428
\end{align*}
\]

\[
\begin{align*}
M &= 36.30 \\
SD &= 12.17 \\
N &= 46
\end{align*}
\]
predictive validity

How precisely can children with later spelling difficulties be identified by the test?

cut-off points

children at risk
result in phon test ≤ 35 pts (at the beginning of 1st grade)

children with spelling difficulties
result in spelling test ≤ 8 words (at the end of 1st grade)

all children who took part in the spelling test (N = 450)
M 44.59; SD = 9.14
M – SD = 35.45
predictive validity

<table>
<thead>
<tr>
<th></th>
<th>spelling difficulties</th>
<th>spelling no difficulties</th>
</tr>
</thead>
<tbody>
<tr>
<td>risk</td>
<td>26 (56.5%)</td>
<td>45 (11.1%)</td>
</tr>
<tr>
<td>no risk</td>
<td>20 (43.5%)</td>
<td>359 (88.9%)</td>
</tr>
<tr>
<td></td>
<td>46 (100%)</td>
<td>404 (100%)</td>
</tr>
<tr>
<td>total</td>
<td>450</td>
<td>100%</td>
</tr>
</tbody>
</table>

true positive rate: 56.50% children with spelling difficulties
miss rate: 43.50%
true negative rate: 88.9% children without spelling difficulties
false positive rate: 11.10%
### Predictive Validity

<table>
<thead>
<tr>
<th></th>
<th>Spelling Difficulties</th>
<th>No Spelling Difficulties</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Risk</strong></td>
<td>26 (36.6%)</td>
<td>45 (63.4%)</td>
<td>71 (100%)</td>
</tr>
<tr>
<td><strong>No Risk</strong></td>
<td>20 (5.3%)</td>
<td>359 (94.7%)</td>
<td>379 (100%)</td>
</tr>
</tbody>
</table>

**Total:** 450

- **Positive Predictive Value:** 36.6% children with spelling difficulties
- **False Positive Predictive Value:** 63.4%
- **Negative Predictive Value:** 94.7% no spelling difficulties
- **False Negative Predictive Value:** 5.3%

### RATZ Index

- **RATZ Index:** 48.4% => good/acceptable but unspecific

Relativer Anstieg der Trefferquote gegenüber der Zufallstrefferquote

Increase of the hit-rate compared to the hit rate by chance (in percent)

- 0 – 33% unacceptable; 34 – 66% good but unspecific; 67 – 100% very good classification
predictive validity - conclusion

- correlation phon awareness * spelling explains 30% variance
  - 70% unexplained variance

- 57% of the children with later deficits were identified
  - 43% of the children with later deficits were not identified

- 37% of the children “at risk” did show a spelling deficit
  - 63% of the children “at risk” did not show a spelling deficit

- RATZ index = 48%
  - acceptable classification but unspecific (by definition)
predictive validity - conclusion

- The results of this re-analyses are slightly better than the results of the re-analyses of the Bielefelder Screening (Brügelmann 2003, 2005; Marx/ Weber 2006).

- The results of this analyses contribute to recent findings that phonological awareness is overestimated as a strong predictor of later (reading and) spelling competencies and therefore as a prerequisite skill.

Thank you very much for your attention!

R.-Philipp Rackwitz
PH Schwäbisch Gmünd
Oberbettringer Str. 200
73525 Schwäbisch Gmünd
GERMANY
+49 (0) 71 71 / 983-214
ruediger-philipp.rackwitz@ph-gmuend.de